

December 2, 1985

Mr. C. H. Fancy
Bureau of Air Quality Management
2600 Blair Stone Road
Tallahassee, Florida 32301-8241

Dear Mr. Fancy:

At this time, Agrico Chemical Company has the following valid construction permits for an expansion at South Pierce Chemical Works:

<u>PERMIT NO.</u>	<u>SOURCE</u>	<u>EXPIRATION DATE</u>
AC53-34868	Phosphoric Acid Plant	12/31/85
AC53-34871	Sulfuric Acid Plant	12/31/85
AC53-34861	DAP Plant	12/31/85
AC53-34865	DAP Storage	12/31/85

Due to economic conditions that have caused an industry-wide decline in sales of fertilizer products, it has not been possible for Agrico to move forward with the expansion as planned. Agrico does expect to complete the project at such time as the conditions improve.

It is requested that the permits be extended for a period of 48 months, until December 31, 1989. The D.E.R. will be notified prior to commencement of construction. Also, it is recognized that Agrico would have to demonstrate the adequacy of any previous determination of BACT before beginning construction.

Should you have any questions concerning the above, or require additional information, please do not hesitate to contact me at your convenience. We look forward to hearing from you regarding the request for extension in the near future.

Yours truly,



Edward E. Mayer,
Environmental Engineer

Cop: *12-10-85*

cc: V. Snow
L. Lahman

DER

DEC 06 1985

BAQM



Chemical Company

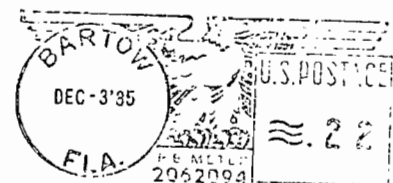
SOUTH PIERCE CHEMICAL WORKS

P. O. Box 1969

State Road 630

Bartow, Florida 33830

Mr. C. H. Fancy
Bureau of Air Quality Management
2600 Blair Stone Road
Tallahassee, FL 32301-8241

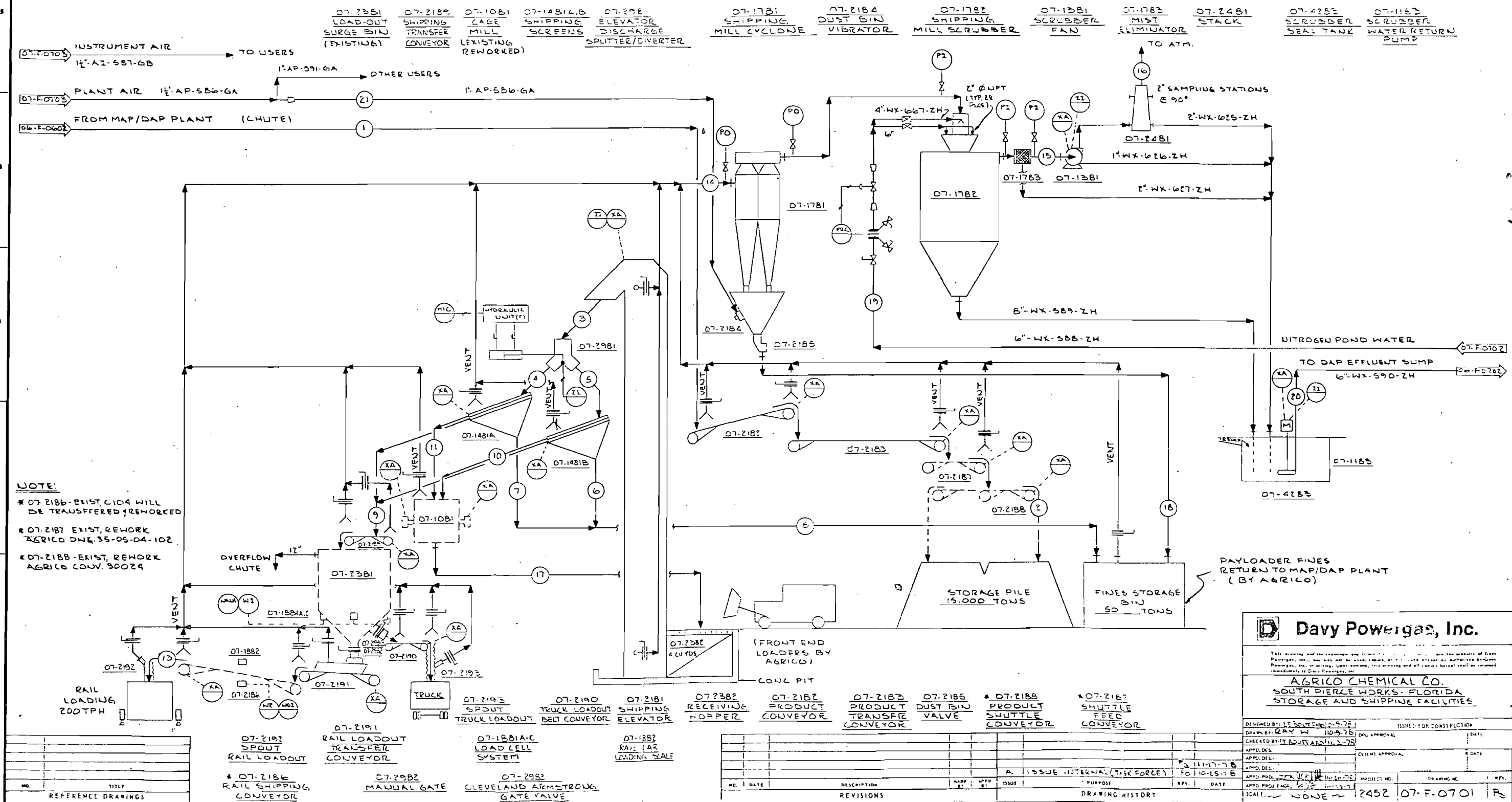


12/9

Bill -
This definitely needs to
be cleared thru legal
before authorizing.

Clair
Willard
What do you
think BT

STREAM NUMBER	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
DESCRIPTION	PRODUCT FROM GRANULATION PLANT	PRODUCT TO STORAGE PILE	FINES FROM 2" SHIPPING SCREEN	PRODUCT TO 2" SHIPPING SCREEN	PRODUCT TO 2" SHIPPING SCREEN	FINES FROM 2" SHIPPING SCREEN	FINES FROM 2" SHIPPING SCREEN	TOTAL FINES FROM SHIPPING SCREENS	TOTAL OXIDE FROM SHIPPING SCREENS	OXIDE FROM 2" SHIPPING SCREEN	OXIDE FROM 2" SHIPPING SCREEN	PRODUCT TO TAIL LANDING	OXIDE TO PAIL CAR CHARGE	FINES TO SHIPPER MILL (CYCLONES)	GASES TO SHIPPER FAN	GASES TO ATMOSPHERE	GROUND WATER FROM CHAIN MILL	FINES FROM SHIPPING MILL (CYCLONES)	OVER-TROUGH TO 10" WATER FID SURVEYOR	NITROGEN DIOXIDE TO DAF FEEDER SUMP	PLANT AIR TO DUST BLOWN VAPORATOR	
	STPH	STPH	STPH	STPH	STPH	STPH	STPH	STPH	STPH	STPH	STPH	STPH	STPH	STPH	ACFM	ACFM	STPH	STPH	GPM	GPM	ACFM	
DAP 18-46-D	70	70	212	106	106	2	2	4	200	2	2	200	200	30,000	30,000	30,000	4	4	400	400	2.7	
MAP 11-54-D	70	70	212	106	106	2	2	4	200	2	2	200	200	30,000	30,000	30,000	4	4	400	400	2.7	
SPECIFIC GRAVITY (1b/ft ³)	(59)	(59)	(59)	(59)	(59)	(59)	(59)	(59)	(59)	(59)	(59)	(59)	(59)	—	—	—	(59)	(59)	1.0	1.0	—	
TEMPERATURE °F	100-120	100-120	100	100	100	100	100	100	100	100	100	100	100	95	95	95	100	100	95	95	100	
PRESSURE PSIG (IN H ₂ O)	—	—	—	—	—	—	—	—	—	—	—	—	—	(-5.0)	(-22.5)	ATM	—	—	50	20	BD	
VISCOSITY CP	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.0	1.0	—	
MATERIAL FLOW DESIGN	100	100	250	125	125	20	20	20	250	20	20	250	250	30,000	30,000	30,000	20	20	500	500	5	



BEFORE THE STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

In Re:)	OGC File No.:	86-0123
)		86-0124
AGRICO CHEMICAL COMPANY,)		86-0125
)		86-0126
)		
)		

ORDER

On December 2, 1985, Agrico Chemical Company requested a 48 month extension of the expiration dates of Agrico's state construction permits, made by Mr. Edward E. Mayer, Environmental Engineer. I have reviewed the request and find that it must be denied for the following reasons.

In 1981, state applications for permits to construct were reviewed and construction permits issued for the four sources listed below. The permits were issued based on the air pollution control regulations in effect on January 30, 1981. Time required to construct the sources was listed in the applications. The state permits issued allowed sufficient time for construction or modification, start of operations, and compliance testing as required by Florida Administrative Code Rule 17-2.210. This data is summarized in the following table:

<u>Permit No.</u>	<u>Sources</u>	<u>Construction Time</u>	<u>Issue Date</u>	<u>Expiration Date</u>
AC53-34868	Phos. Acid Plant	15 Months	1/30/81	6/30/82
AC53-34871	Sulfuric Acid Plant	24 Months	1/30/81	3/30/83
AC53-34861	DAP Plant	22 Months	1/30/81	1/30/83
AC53-34865	DAP Storage/ Shipping	22 Months	1/30/81	1/30/83

Upon request dated June 2, 1982, the Department extended the expiration dates of the four construction permits until December 31, 1985.

DER

FEB 12 1986

BAQM

Agrico has chosen not to construct the sources pursuant to the permits, even though those permits have now been in effect for more than 5 years. There have been no technical problems which required Agrico to suspend construction. Rather, Agrico felt it was not in its best economic interest to commence construction. Agrico has also expressed to the department that it does not intend to commence construction until economic conditions are such that it will be in Agrico's interest to do so.

I find that Agrico has been granted a more than reasonable amount of time to construct the permitted facilities. Florida Administrative Code Rule 17-2.210(1) provides in part that "the construction permit shall be issued for a period of time sufficient to allow construction of the source and operation while the new or modified source is beginning operation and conducting tests..." The amount of time granted in the permits has been more than sufficient, given reasonable diligence, to complete those activities. In addition, 40 CFR 52.1,(r)(2) states, "approval to construct shall become invalid if construction is not commenced within 18 months after receipt of approval, if construction is discontinued for a period of 18 months or more, or if construction is not completed within a reasonable time." The Department does not consider a self imposed moratorium on construction based on economic decisions entirely in the control of the applicant to be valid grounds for a second extension of a permit, particularly in the absence of any intent to commence construction.

Having carefully considered Agrico's request for extension of its permits together with the factual background for the request, and being otherwise fully advised, it is therefore,

ORDERED that the request for further extension of permit Nos. AC53-34868, AC53-34861, AC53-34871 and AC53-34865 is DENIED.

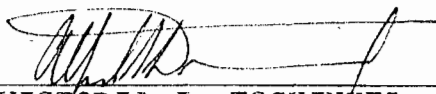
Persons whose substantial interests are affected by the above agency action have a right, pursuant to Section 120.57, Florida Statutes, to petition for an administrative determination (hearing) on the action. The petition must conform to the

requirements of Chapter 17-103 and 28-5, Florida Administrative Code, and must be filed (received) with the Department's Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32301, within fourteen (14) days of receipt of this notice. Failure to file a petition within the fourteen (14) days constitutes a waiver of any right such person has to an administrative determination (hearing) pursuant to Section 120.57, Florida Statutes.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the proposed agency action. Persons whose substantial interests will be affected by any decision of the Department have the right to intervene in the proceeding. A petition for intervention must be filed pursuant to Model Rule 28-5.207, Florida Administrative Code, at least five (5) days before the final hearing and be filed with the Hearing Officer if one has been assigned at the Division of Administrative Hearings, Department of Administration, 2009 Apalachee Parkway, Tallahassee, Florida 32301. If no Hearing Officer has been assigned, the petition is to be filed with the Department's Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32301. Failure to petition to intervene within the allowed time frame constitutes a waiver of any right such person has to an administrative determination (hearing) under Section 120.57, Florida Statutes.

DONE AND ORDERED this 11th day of ^{Feb}~~January~~, 1986, in Tallahassee, Florida.

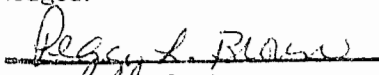
STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION


VICTORIA J. TSCHINKEL
Secretary

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32301
Telephone: (904) 488-4805

FILING AND ACKNOWLEDGEMENT

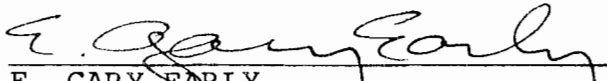
FILED, on this date, pursuant to S120.52 (9), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.


Clerk

2-12-86
Date

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a true copy of the foregoing Order has been furnished by U.S. Mail to J.C. Lahman, Plant Manager, Agrico Chemical Company, Post Office Box 1969, Bartow, Florida 33830, this 13 day of January, 1986.


E. GARY EARLY
Senior Attorney

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32301
Telephone: (904) 488-9730

DEPARTMENT OF ENVIRONMENTAL REGULATION

**ROUTING AND
TRANSMITTAL SLIP**

ACTION NO

ACTION DUE DATE

1. TO: (NAME, OFFICE, LOCATION)

Chair Nancy

Initial

Date

2.

D-304

2/14

Initial

Date

3.

~~Bill Davis~~; ~~Ed Huck~~

Initial

Date

4.

~~Pradeep Raval~~; J. Le

Initial

Date

REMARKS:

*Pradeep: make sure SW district
received a copy.*

Chair

INFORMATION

Review & Return

Review & File

Initial & Forward

DISPOSITION

Review & Respond

Prepare Response

For My Signature

For Your Signature

Let's Discuss

Set Up Meeting

Investigate & Report

Initial & Forward

Distribute

Concurrence

For Processing

Initial & Return

DER

FEB 12 1986

BAQM

FROM:

E. Mary Early

DATE

2/12/86

PHONE

8-9730

June 28, 1982

Mr. J. C. Lahman, Plant Manager
Agrico Chemical Company
P.O. Box 1969
Bartow, Florida 33830

Dear Mr. Lahman:

The request for extension of the expiration date of the state construction permits submitted by Mr. Lawrence N. Curtin of Holland & Knight on behalf of Agrico Chemical Company has been reviewed and the following findings noted.

1. State applications for permits to construct were reviewed and construction permits issued based on the air pollution control regulations in effect on January 30, 1981. Time required to construct the sources was listed in the applications. The state permits issued allowed sufficient time for construction or modification, start of operations, and compliance testing. This data is summarized in the following table.

<u>Permit No.</u>	<u>Source</u>	<u>Construction Time</u>	<u>Issue Date</u>	<u>Expiration Date</u>
AC53-34868	Phos. Acid Plant	15 months	1/30/81	6/30/82
AC53-34871	Sulfuric Acid Plant	24 months	1/30/81	3/30/83
AC53-34861	DAP Plant	22 months	1/30/81	1/30/83
AC53-34865	DAP Storage/ Shipping	22 months	1/30/81	1/30/83

Mr. J. C. Lahman
June 28, 1982
Page Two

2. A state permit to construct a purified MAP/DAP facility at the same phosphate fertilizer complex was issued by the Department's Southwest District Office (AC53-42155, issued July 17, 1981, expires December 15, 1982).
3. Construction of the purified MAP/DAP facility is proceeding in accordance with state permit, AC53-42155.
4. Construction/modification of the sources listed in 1 above has been delayed at the Company's option, because of the economic conditions associated with a decline in sales of fertilizer products.
5. Agrico Chemical Company, through its agent at Holland & Knight, is requesting that the expiration date of the construction permits for the four sources listed in 1 be extended to December 31, 1985.

Based on the proceeding facts, the Department has reached the following conclusion.

1. Agrico Chemical Company plans to handle the construction/modification allowed by the 5 state permits mentioned earlier in phases with the purified MAP/DAP facility being constructed first and the other sources built at a later date. All sources will be completed and tested by December 31, 1985.
2. This phased construction makes the source subject to Section 17-2.630(3), FAC, Phased Construction Project. This rule requires the owner or operator of the facility to demonstrate the adequacy of any previous determination of BACT before beginning construction.
3. All modifications to permit conditions are subject to Section 17-4.08, FAC. This rule allows the Department to require the permittee to comply with new or additional conditions, for good cause.

Pursuant to Section 17-2.630(3), FAC, and Section 17-4.08, FAC, the Department will extend the expiration dates of the state construction permits as requested and require the agent for the source to demonstrate the adequacy of all BACT determinations for

Mr. J. C. Lahman
June 28, 1982
Page Three

there permits before beginning construction. The Department reserved the right to add new or additional conditions, with good cause, if needed to protect the ambient air quality from the impact of the new/modified sources.

A copy of this letter must be attached to each affected construction permit and it becomes a part of that permit. The affected permit numbers are listed below.

<u>Permit No.</u>	<u>Original Expiration Date</u>	<u>Modified Expiration Date</u>
AC53-34868	6/30/82	12/31/85
AC53-34871	3/30/83	12/31/85
AC53-34861	1/30/83	12/31/85
AC53-34865	1/30/83	12/31/85

Sincerely,

/s/Victoria J. Tschinkel

Victoria J. Tschinkel
Secretary

VT:CF:ras

cc: Southwest District
Holland & Knight

Agrico

Call Dan Williams

LAW OFFICES

HOLLAND & KNIGHT

P. O. Box 1068
245 SOUTH CENTRAL AVENUE
BARTOW, FLORIDA 33830
(813) 533-1151

P. O. Box 1669
406 THIRTEENTH STREET WEST
BRADENTON, FLORIDA 33506
(813) 746-7107

SUITE 63
5915 PONCE DE LEON BLVD.
CORAL GABLES, FLORIDA 33146
(305) 667-4633

ONE CORPORATE PLAZA
110 EAST BROWARD BLVD.
FORT LAUDERDALE, FLORIDA 33301
(305) 525-1000

P. O. DRAWER B W
92 LAKE WIRE DRIVE
LAKELAND, FLORIDA 33802
(813) 682-1161

P. O. Box 3076
1100 SOUTH TAMiami TRAIL
SARASOTA, FLORIDA 33578
(813) 365-3321

P. O. DRAWER 810
BARNETT BANK BLDG.
TALLAHASSEE, FLORIDA 32302
(904) 224-7000

P. O. Box 1288
EXCHANGE BANK BLDG.
TAMPA, FLORIDA 33601
(813) 223-1621

PLEASE REPLY TO:

Lakeland, Florida
June 2, 1982

600 MARYLAND AVENUE, S.W.
WASHINGTON, D.C. 20024
(202) 484-9090
TWX 710-822-9775

CABLE ADDRESS
HND KNIGHT
TELEX 5-2630

RECEIVED

JUN 7 1982

Dept. of Environmental Regulation
Office of General Counsel

Martha Hall, Esquire
Florida Department of Environmental
Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32301

Re: Agrico Chemical Company - Construction Permits

Dear Marty:

As we recently discussed, Agrico Chemical Company has received construction permits from the Department of Environmental Regulation (DER) for a planned modification of its South Pierce Chemical Works in Bartow, Florida. The total project for which construction permits were issued includes construction of a new diammonium phosphate plant, a new purified MAP and DAP plant, a new sulfuric acid plant and a new DAP storage and shipping facility. In addition, the existing phosphoric acid plant is planned to be modified to increase production capacity.

Due to economic conditions that have caused an industry-wide decline in sales of fertilizer products, it will not be possible for Agrico to move forward with the total project at this time. The Company, however, still plans to complete the project at such time as the conditions are more favorable. Although projections of economic recovery vary, it is expected that conditions will improve within the foreseeable future.

Based upon the Company's revised construction schedule, we hereby request an extension of the expiration date of the DER construction permits for the phosphoric acid, sulfuric acid, and DAP and product load out phases of the project. Construction on the purified MAP/DAP facility will proceed in accordance with the DER permit. The DER identification numbers of the permits for which we are requesting extensions are as follows:

Martha Hall, Esq.
June 2, 1982
Page 2

<u>Permit No.</u>	<u>Source</u>	<u>Current Expiration Date</u>	<u>Extension Request</u>
AC 53-34868	Phosphoric acid plant	June 30, 1982	Dec. 31, 1985
AC 53-34871	Sulfuric acid plant	Mar. 30, 1983	Dec. 31, 1985
AC 53-34861	DAP plant	Jan. 30, 1983	Dec. 31, 1985
AC 53-34865	DAP storage and shipping facility	Jan. 30, 1983	Dec. 31, 1985

Should you have any questions concerning the foregoing or require additional information, please do not hesitate to contact us at your convenience. We look forward to hearing from you regarding the request for extension in the near future.

Sincerely,

HOLLAND & KNIGHT


Lawrence N. Curtin

LNC/er
5674-2431060282:24
cc: Mr. Ed Mayer

Copy to Dan Williams on 6-9-82

Subpart V—Standards of Performance for the Phosphate Fertilizer Industry: Diammonium Phosphate Plants¹⁴

§ 60.220 Applicability and designation of affected facility.⁶⁴

(4) The affected facility to which the provisions of this subpart apply is each granular diammonium phosphate plant. For the purpose of this subpart, the affected facility includes any combination of: reactors, granulators, dryers, coolers, screens, and mills.

(b) Any facility under paragraph (a) of this section that commences construction or modification after October 22, 1971, is subject to the requirements of this subpart.

§ 60.221 Definitions.

As used in this subpart, all terms not defined herein shall have the meaning given them in the Act and in subpart A of this part.

(a) "Granular diammonium phosphate plant" means any plant manufacturing granular diammonium phosphate by reacting phosphoric acid with ammonia.

(b) "Total fluorides" means elemental fluorine and all fluoride compounds as measured by reference methods specified in § 60.224, or equivalent or alternative methods.

(c) "Equivalent P₂O₅ feed" means the quantity of phosphorus, expressed as phosphorous pentoxide, fed to the process.

§ 60.222 Standard for fluorides.

(a) On and after the date on which the performance test required to be conducted by § 60.8 is completed, no owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from any affected facility any gases which contain total fluorides in excess of 30 g/metric ton of equivalent P₂O₅ feed (0.060 lb/ton).

§ 60.223 Monitoring of operations.

(a) The owner or operator of any granular diammonium phosphate plant subject to the provisions of this subpart shall install, calibrate, maintain, and operate a flow monitoring device which can be used to determine the mass flow of phosphorus-bearing feed material to the process. The flow monitoring device shall have an accuracy of ±5 percent over its operating range.

(b) The owner or operator of any granular diammonium phosphate plant shall maintain a daily record of equivalent P₂O₅ feed by first determining the total mass rate in metric ton/hr of phosphorus-bearing feed using a flow monitoring device meeting the requirements of paragraph (a) of this section and then by proceeding according to § 60.224(d).

(c) The owner or operator of any granular diammonium phosphate plant

subject to the provisions of this part shall install, calibrate, maintain, and operate a monitoring device which continuously measures and permanently records the total pressure drop across the scrubbing system. The monitoring device shall have an accuracy of ±5 percent over its operating range.

(Sec. 114, Clean Air Act is amended (42 U.S.C. 7414)), 68, 83

§ 60.224 Test methods and procedures.

(a) Reference methods in Appendix A of this part, except as provided for in § 60.8(b), shall be used to determine compliance with the standard prescribed in § 60.222 as follows:

(1) Method 13A or 13B for the concentration of total fluorides and the associated moisture content,

(2) Method 1 for sample and velocity traverses,

(3) Method 2 for velocity and volumetric flow rate, and

(4) Method 3 for gas analysis.

(b) For Method 13A or 13B, the sampling time for each run shall be at least 60 minutes and the minimum sample volume shall be at least 0.85 dscm (30 dscf) except that shorter sampling times or smaller volumes when necessitated by process variables or other factors, may be approved by the Administrator.

(c) The air pollution control system for the affected facility shall be constructed so that volumetric flow rates and total fluoride emissions can be accurately determined by applicable test methods and procedures.

(d) Equivalent P₂O₅ feed shall be determined as follows:

(1) Determine the total mass rate in metric ton/hr of phosphorus-bearing feed during each run using a flow monitoring device meeting the requirements of § 60.223(a).

(2) Calculate the equivalent P₂O₅ feed by multiplying the percentage P₂O₅ content, as measured by the spectrophotometric molybdovanadophosphate method (AOAC Method 9), times the total mass rate of phosphorus-bearing feed. AOAC Method 9 is published in the Official Methods of Analysis of the Association of Official Analytical Chemists, 11th edition, 1970, pp. 11-12. Other methods may be approved by the Administrator.

(e) For each run, emissions expressed in g/metric ton of equivalent P₂O₅ feed shall be determined using the following equation:

$$E = \frac{(C, G) 10^{-6}}{M_{P_2O_5}}$$

where:

E = Emissions of total fluorides in g/metric ton of equivalent P₂O₅.

C, = Concentration of total fluorides in mg/dscm as determined by Method 13A or 13B.

G, = Volumetric flow rate of the effluent gas stream in dscm/hr as determined by Method 2.

10⁻⁶ = Conversion factor for mg to g.

M_{P₂O₅} = Equivalent P₂O₅ feed in metric ton/hr as determined by § 60.224(d).

(Sec. 114, Clean Air Act is amended (42 U.S.C. 7414)), 68, 83

36 FR 24676, 12/23/71 (1)

as amended

40 FR 33182, 8/6/78 (14)

42 FR 37938, 7/26/77 (84)

42 FR 41424, 8/17/77 (88)

43 FR 8800, 3/3/78 (83)

Subpart H—Standards of Performance for Sulfuric Acid Plants

§ 60.80 Applicability and designation of affected facility. ⁶⁴

(a) The provisions of this subpart are applicable to each sulfuric acid production unit, which is the affected facility.

(b) Any facility under paragraph (a) of this section that commences construction or modification after August 17, 1971, is subject to the requirements of this subpart.

§ 60.81 Definitions.

As used in this subpart, all terms not defined herein shall have the meaning given them in the Act and in Subpart A of this part.

(a) "Sulfuric acid production unit" means any facility producing sulfuric acid by the contact process by burning elemental sulfur, alkylation acid, hydrogen sulfide, organic sulfides and mercaptans, or acid sludge, but does not include facilities where conversion to sulfuric acid is utilized primarily as a means of preventing emissions to the atmosphere of sulfur dioxide or other sulfur compounds.

(b) "Acid mist" means sulfuric acid mist, as measured by Method 8 of Appendix A to this part or an equivalent or alternative method. ⁸

§ 60.82 Standard for sulfur dioxide. ⁸

(a) On and after the date on which the performance test required to be conducted by § 60.8 is completed, no owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from any affected facility any gases which contain sulfur dioxide in excess of 2 kg per metric ton of acid produced (4 lb per ton), the production being expressed as 100 percent H₂SO₄.

§ 60.83 Standard for acid mist. ^{3, 8}

(a) On and after the date on which the performance test required to be conducted by § 60.8 is completed, no owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from any affected facility any gases which:

(1) Contain acid mist, expressed as H₂SO₄, in excess of 0.075 kg per metric ton of acid produced (0.15 lb per ton), the production being expressed as 100 percent H₂SO₄.

(2) Exhibit 10 percent opacity, or greater. ¹⁸

§ 60.84 Emission monitoring. ¹⁸

(a) A continuous monitoring system for the measurement of sulfur dioxide shall be installed, calibrated, maintained, and operated by the owner or operator. The pollutant gas used to prepare calibration gas mixtures under paragraph 2.1, Performance Specification 2 and for

calibration checks under § 60.13(d) to this part, shall be sulfur dioxide (SO₂). Reference Method 8 shall be used for conducting monitoring system performance evaluations under § 60.13(c), except that only the sulfur dioxide portion of the Method 8 results shall be used. The span shall be set at 1000 ppm of sulfur dioxide.

(b) The owner or operator shall establish a conversion factor for the purpose of converting monitoring data into units of the applicable standard (kg/metric ton, lb/short ton). The conversion factor shall be determined, as a minimum, three times daily by measuring the concentration of sulfur dioxide entering the converter using suitable methods (e.g., the Reich test, National Air Pollution Control Administration Publication No. 999-AP-13 and calculating the appropriate conversion factor for each eight-hour period as follows:

$$CF = k \left[\frac{1,000 - 0.015r}{r - s} \right]$$

where:

CF = conversion factor (kg/metric ton per ppm, lb/short ton per ppm).

k = constant derived from material balance. For determining CF in metric units, k = 0.0653. For determining CF in English units, k = 0.1306.

r = percentage of sulfur dioxide by volume entering the gas converter. Appropriate corrections must be made for air injection plants subject to the Administrator's approval.

s = percentage of sulfur dioxide by volume in the emissions to the atmosphere determined by the continuous monitoring system required under paragraph (a) of this section.

(c) The owner or operator shall record all conversion factors and values under paragraph (b) of this section from which they were computed (i.e., CF, r, and s).

(d) [Reserved] ⁸

(e) For the purpose of reports under § 60.7(c), periods of excess emissions shall be all three-hour periods (or the arithmetic average of three consecutive one-hour periods) during which the integrated average sulfur dioxide emissions exceed the applicable standards under § 60.82. ^{4, 18}

(Sec. 114, Clean Air Act is amended (42 U.S.C. 7414)). ^{68, 83}

§ 60.85 Test methods and procedures. ⁸

(a) The reference methods in Appendix A to this part, except as provided for in § 60.8(b), shall be used to determine compliance with the standards prescribed in §§ 60.82 and 60.83 as follows:

(1) Method 8 for the concentrations of SO₂ and acid mist;

(2) Method 1 for sample and velocity traverses;

(3) Method 2 for velocity and volumetric flow rate; and

(4) Method 3 for gas analysis.

(b) The moisture content can be considered to be zero. For Method 8 the sam-

pling time for each run shall be at least 60 minutes and the minimum sample volume shall be 1.15 dscm (40.6 dscf) except that smaller sampling times or sample volumes, when necessitated by process variables or other factors, may be approved by the Administrator.

(c) Acid production rate, expressed in metric tons per hour of 100 percent H₂SO₄, shall be determined during each testing period by suitable methods and shall be confirmed by a material balance over the production system.

(d) Acid mist and sulfur dioxide emissions, expressed in g/metric ton of 100 percent H₂SO₄, shall be determined by dividing the emission rate in g/hr by the acid production rate. The emission rate shall be determined by the equation,

$g/hr = Q \times c$, where Q = volumetric flow rate of the effluent in dscm/hr as determined in accordance with paragraph (a) (3) of this section, and c = acid mist and SO₂ concentrations in g/dscm as determined in accordance with paragraph (a) (1) of this section.

(Sec. 114, Clean Air Act is amended (42 U.S.C. 7414)). ^{68, 83}

36 FR 24876, 12/23/71 (1)

as amended

38 FR 13562, 5/23/73 (3)
38 FR 28564, 10/15/73 (4)
39 FR 20790, 6/14/74 (8)
40 FR 46250, 10/6/75 (18)
42 FR 37936, 7/25/77 (64)
42 FR 41424, 8/17/77 (68)
43 FR 8800, 3/3/78 (83)

Subpart T—Standards of Performance for the Phosphate Fertilizer Industry: Wet-Process Phosphoric Acid Plants¹⁴

§ 60.200 Applicability and designation of affected facility.⁶⁴

(a) The affected facility to which the provisions of this subpart apply is each wet-process phosphoric acid plant. For the purpose of this subpart, the affected facility includes any combination of: reactors, filters, evaporators, and hot-wells.

(b) Any facility under paragraph (a) of this section that commences construction or modification after October 22, 1974, is subject to the requirements of this subpart.

§ 60.201 Definitions.

As used in this subpart, all terms not defined herein shall have the meaning given them in the Act and in Subpart A of this part.

(a) "Wet-process phosphoric acid plant" means any facility manufacturing phosphoric acid by reacting phosphate rock and acid.

(b) "Total fluorides" means elemental fluorine and all fluoride compounds as measured by reference methods specified in § 60.204, or equivalent or alternative methods.

(c) "Equivalent P_2O_5 feed" means the quantity of phosphorus, expressed as phosphorous pentoxide, fed to the process.

§ 60.202 Standard for fluorides.

(a) On and after the date on which the performance test required to be conducted by § 60.8 is completed, no owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from any affected facility any gases which contain total fluorides in excess of 10.0 g/metric ton of equivalent P_2O_5 feed (0.020 lb/ton).

§ 60.203 Monitoring of operations.

(a) The owner or operator of any wet-process phosphoric acid plant subject to the provisions of this subpart shall install, calibrate, maintain, and operate a monitoring device which can be used to determine the mass flow of phosphorus-bearing feed material to the process. The monitoring device shall have an accuracy of ± 5 percent over its operating range.

(b) The owner or operator of any wet-process phosphoric acid plant shall maintain a daily record of equivalent P_2O_5 feed by first determining the total mass rate in metric ton/hr of phosphorus bearing feed using a monitoring device for measuring mass flowrate which meets the requirements of paragraph (a) of this section and then by proceeding according to § 60.204(d) (2).

(c) The owner or operator of any wet-process phosphoric acid plant subject to the provisions of this part shall install, calibrate, maintain, and operate a monitor-

ing device which continuously measures and permanently records the total pressure drop across the process scrubbing system. The monitoring device shall have an accuracy of ± 5 percent over its operating range.

(Sec. 114, Clean Air Act is amended (42 U.S.C. 7414)), 68, 83

§ 60.204 Test methods and procedures.

(a) Reference methods in Appendix A of this part, except as provided in § 60.8 (b), shall be used to determine compliance with the standard prescribed in § 60.202 as follows:

(1) Method 13A or 13B for the concentration of total fluorides and the associated moisture content,

(2) Method 1 for sample and velocity traverses,

(3) Method 2 for velocity and volumetric flow rate, and

(4) Method 3 for gas analysis.

(b) For Method 13A or 13B, the sampling time for each run shall be at least 60 minutes and the minimum sample volume shall be 0.85 dscm (30 dscf) except that shorter sampling times or smaller volumes, when necessitated by process variables or other factors, may be approved by the Administrator.

(c) The air pollution control system for the affected facility shall be constructed so that volumetric flow rates and total fluoride emissions can be accurately determined by applicable test methods and procedures.

(d) Equivalent P_2O_5 feed shall be determined as follows:

(1) Determine the total mass rate in metric ton/hr of phosphorus-bearing feed during each run using a flow monitoring device meeting the requirements of § 60.203(a).

(2) Calculate the equivalent P_2O_5 feed by multiplying the percentage P_2O_5 content, as measured by the spectrophotometric molybdovanadophosphate method (AOAC Method 9), times the total mass rate of phosphorus-bearing feed. AOAC Method 9 is published in the Official Methods of Analysis of the Association of Official Analytical Chemists, 11th edition, 1970, pp. 11-12. Other methods may be approved by the Administrator.

(e) For each run, emissions expressed in g/metric ton of equivalent P_2O_5 feed shall be determined using the following equation:

$$E = \frac{(C \cdot Q) \cdot 10^{-3}}{M_{P_2O_5}}$$

where:

E = Emissions of total fluorides in g/metric ton of equivalent P_2O_5 feed.

C = Concentration of total fluorides in mg/dscm as determined by Method 13A or 13B.

Q = Volumetric flow rate of the effluent gas stream in dscm/hr as determined by Method 2.

10^{-3} = Conversion factor for mg to g.

$M_{P_2O_5}$ = Equivalent P_2O_5 feed in metric ton/hr as determined by § 60.204(d).

(Sec. 114, Clean Air Act is amended (42 U.S.C. 7414)), 68, 83

36 FR 24876, 12/23/71 (1)

as amended

40 FR 33152, 8/6/75 (14)

42 FR 37936, 7/25/77 (64)

42 FR 41424, 8/17/77 (68)

43 FR 8800, 3/3/78 (83)

TABLE II
EMISSION LIMITING STANDARDS

Stationary Sources	Particulates	Objectionable odor	Visible emissions	Fluorides (water soluble or gaseous atomic weight 19) expressed as pounds of fluoride per ton of phosphatic materials input to the system expressed as tons of P_2O_5
C. PHOSPHATE PROCESS (cont.)				
(1) (d) Granular triple superphosphate (GTSP) production and auxiliary equipment				
✓ 1. GTSP made by granulating run-of-pile TSP				0.06 pounds
2. GSTP made from phosphoric acid and phosphate rock slurry				0.15 pounds
✓ (e) GTSP storage and auxiliary equipment				0.05 pounds
(f) Diammonium phosphate production and auxiliary equipment				0.06 pounds
(g) Calcining or other thermal phosphate rock processing and auxiliary equipment excepting phosphate rock drying and defluorinating				0.05 pounds
(h) Defluorinating phosphate rock by thermal processing and auxiliary equipment				0.37 pounds
(i) All plants, plant sections or unit operations and auxiliary equipment not listed in 17-2.05(6) Table II items C.(1) (a) through (h).	Must comply with best technology pursuant to 17-2.03(1)			
(2) Existing plants or plant sections. Emissions shall comply with 17-2.05(6) Table II Item C.(1). Effective July 1, 1975 or				
(3) Existing plant complexes with an operating wet process phosphoric acid section (including any items 17-2.05(6) Table II items C.(1)(a) through (f) and other plant sections processing or handling phosphoric acid or products or phosphoric acid processing				Total emission of the entire complex shall not exceed 0.4 pounds per ton of P_2O_5 input to the wet process phosphoric acid section
(4) Individual plant sections included in 17-2.05(6) Table II items C.(1) (a) through (f) but not included as a part as defined in C. (3)	If it can be shown by comprehensive engineering study and report to the Department that the existing plant sections are not suitable for the application of existing technology, which may include major rebuilding or repairs and scrubber installations, the emission limiting standard to apply will be the lowest obtained by any similar plant section existing and operating.			

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

INTEROFFICE MEMORANDUM

For Routing To District Offices And/Or To Other Than The Addressee		
To: _____	Locn.: _____	
To: _____	Locn.: _____	
To: _____	Locn.: _____	
From: _____	Date: _____	
Reply Optional []	Reply Required []	Info. Only []
Date Due: _____	Date Due: _____	

TO: Jacob D. Varn
FROM: *Steve Smallwood*
DATE: January 30, 1981
SUBJ: Approval and Signature - Air Construction Permits
Agrico Chemical Company, Polk County

Attached please find four Air Construction Permits for Agrico Chemical Company. The proposed permits are for a sulfuric acid plant, DAP plant, DAP storage and shipping facility and a phosphoric acid plant modification at the Agrico Chemical Company plant on State Road 630, Polk County, Florida.

Day 90, after which the permits would be issued by default, is February 1, 1981.

We recommend that you approve and sign the attached construction permits.

SS:dav

Attachments

No. 467349

RECEIPT FOR CERTIFIED MAIL

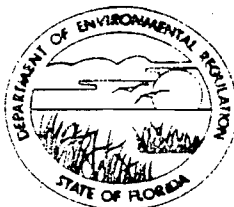
NO INSURANCE COVERAGE PROVIDED—
NOT FOR INTERNATIONAL MAIL

(See Reverse)

SENT TO		J.C. LAUMAN	
STREET AND NO.		P.O. 1969	
P.O., STATE AND ZIP CODE		BARTOW, FL 33830	
POSTAGE		\$	
CONSULT POSTMASTER FOR FEES OPTIONAL SERVICES	CERTIFIED FEE	¢	
	SPECIAL DELIVERY	¢	
	RESTRICTED DELIVERY	¢	
	RETURN RECEIPT SERVICE	SHOW TO WHOM AND DATE DELIVERED	
	RETURN RECEIPT SERVICE	SHOW TO WHOM, DATE, AND ADDRESS OF DELIVERY	
	RETURN RECEIPT SERVICE	SHOW TO WHOM AND DATE DELIVERED WITH RESTRICTED DELIVERY	
	RETURN RECEIPT SERVICE	SHOW TO WHOM, DATE AND ADDRESS OF DELIVERY WITH RESTRICTED DELIVERY	
TOTAL POSTAGE AND FEES		\$	
POSTMARK OR DATE			
1/30/81			

PS Form 3800, Apr. 1976

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301



BOB GRAHAM
GOVERNOR
JACOB D. VARN
SECRETARY

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

January 30, 1981

Mr. J.C. Lahman, Plant Manager
Agrico Chemical Company
P. O. Box 1969
Bartow, Florida

Dear Mr. Lahman:

AC 53-34861 AC 53-34868
Enclosed is Permit Number AC 53-34865 AC 53-34871 dated January 30, 1981
to Agrico Chemical Company
issued pursuant to Section 403, Florida Statutes.

Acceptance of the permit constitutes notice and agreement that the Department will periodically review this permit for compliance, including site inspections where applicable, and may initiate enforcement actions for violation of the conditions and requirements thereof.

Sincerely,

Laurena George
for Steve Smallwood, Chief
Bureau of Air Quality Management

cc: Kent Williams
J.B. Koogler
Dan Williams

Final Determination

Agrico Chemical Company
Polk County, Florida

Construction Permit

Application Numbers:

AC 53-34861
AC 53-34865
AC 53-34868
AC 53-34871

Florida Department of Environmental Regulation

Bureau of Air Quality Management

Central Air Permitting

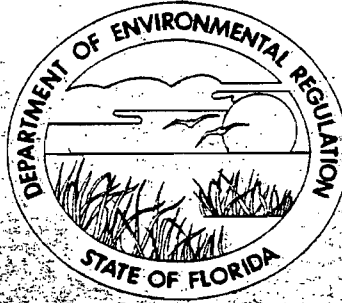
January 30, 1981

Final Determination

Agrico Chemical Company's applications for permits to construct a sulfuric acid plant, DAP plant, DAP storage and shipping facility and to modify a phosphoric acid plant at their chemical complex in Polk County, Florida, have been reviewed by the Bureau of Air Quality Management. Public notice of the Department's Intent to Issue was published in the Tampa Tribune on January 1, 1981.

Copies of the preliminary determination were available for public inspection at the Department's Southwest District Office in Tampa and Bureau of Air Quality Management in Tallahassee. No comments were received by the Department as a result of the public notice.

The final action of the Department is to issue the permits as proposed in the preliminary determination.



STATE OF FLORIDA
DEPARTMENT OF
ENVIRONMENTAL REGULATION

CONSTRUCTION
PERMIT

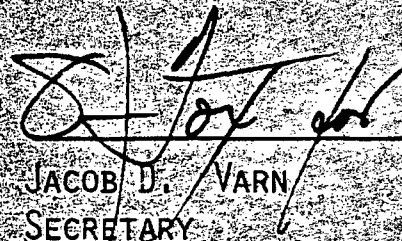
NO. AC 53-34868
AGRICO CHEMICAL COMPANY
BARTOW, FLORIDA
PHOSPHORIC ACID PLANT

DATE OF ISSUANCE

JANUARY 30, 1981

DATE OF EXPIRATION

1982
JUNE 30, 1981


JACOB D. VARN
SECRETARY

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301



BOB GRAHAM
GOVERNOR

JACOB D. VARN
SECRETARY

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

APPLICANT: Agrico Chemical Company
P. O. Box 1969
Bartow, Florida 33930

PERMIT/CERTIFICATION
NO.AC 53-34868

COUNTY: Polk

PROJECT: Phosphoric
Acid Plant

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Chapter 17-2 and 17-4, Florida Administrative Code. The above named applicant, hereinafter called Permittee, is hereby authorized to perform the work or operate the facility shown on the approved drawing(s), plans, documents, and specifications attached hereto and made a part hereof and specifically described as follows:

For the modification of two existing phosphoric acid plants to be located at State Road 630, South Pierce, in Polk County, Florida. The UTM Coordinates of the proposed plants are 407.5 km E and 3071.4 km N.

Construction shall be in accordance with the attached permit application and plans, documents and drawings except as otherwise noted on page "3", Specific Conditions".

Attachments are as follows:

1. Application to Construct Air Pollution Sources, DER Form 17-1.122(16).
2. Agrico Chemical Company, Responses to Technical Discrepancies, October 30, 1980.

PERMIT NO.: 53-34868
 APPLICANT: Agrico Chemical Company

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions", and as such are binding upon the permittee and enforceable pursuant to the authority of Section 403.161(1), Florida Statutes. Permittee is hereby placed on notice that the department will review this permit periodically and may initiate court action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.
2. This permit is valid only for the specific processes and operations indicated in the attached drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit shall constitute grounds for revocation and enforcement action by the department.
3. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately notify and provide the department with the following information: (a) a description of and cause of non-compliance; and (b) the period of non-compliance, including exact dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance. The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the department for penalties or revocation of this permit.
4. As provided in subsection 403.087(6), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.
5. This permit is required to be posted in a conspicuous location at the work site or source during the entire period of construction or operation.
6. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, which are submitted to the department, may be used by the department as evidence in any enforcement case arising under the Florida Statutes or department rules, except where such use is proscribed by Section 403.111, F.S.
7. In the case of an operation permit, permittee agrees to comply with changes in department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or department rules.
8. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, plant, or aquatic life or property and penalties therefore caused by the construction or operation of this permitted source, nor does it allow the permittee to cause pollution in contravention of Florida Statutes and department rules, except where specifically authorized by an order from the department granting a variance or exception from department rules or state statutes.
9. This permit is not transferable. Upon sale or legal transfer of the property or facility covered by this permit, the permittee shall notify the department within thirty (30) days. The new owner must apply for a permit transfer within thirty (30) days. The permittee shall be liable for any non-compliance of the permitted source until the transferee applies for and receives a transfer of permit.
10. The permittee, by acceptance of this permit, specifically agrees to allow access to permitted source at reasonable times by department personnel presenting credentials for the purposes of inspection and testing to determine compliance with this permit and department rules.
11. This permit does not indicate a waiver of or approval of any other department permit that may be required for other aspects of the total project.
12. This permit conveys no title to land or water, nor constitutes state recognition or acknowledgement of title, and does not constitute authority for the reclamation of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.
13. This permit also constitutes:
 - ☒ Determination of Best Available Control Technology (BACT)
 - ☒ Determination of Prevention of Significant Deterioration (PSD)
 - ☐ Certification of Compliance with State Water Quality Standards (Section 401, PL 92-500)

PERMIT NO.: AC 53-34868
APPLICANT: Agrico Chemicals Company

Specific Conditions

Phosphoric Acid Plant

1. Maximum production rate will be 100 ton per hour at 100% P_2O_5 .
2. Maximum operating time will be 7,884 hours per year.
3. The maximum amount of total fluoride emitted will be 0.02 lb. F/ton P_2O_5 input and 1.11 lbs. F/hr. from each stack.
4. Fugitive emissions in the Phosphoric Acid Plant will be controlled by sealing and venting all fumes from the process and conveying equipment to pollution control equipment.
5. Reasonable precautions to prevent fugitive particulate emissions during construction such as coating or spraying roads and construction sites used by contractors will be taken by the Permittee.
6. Construction should reasonably conform to the plans submitted in the application.
7. The applicant should report any delays in construction and completion.
8. Before the construction permit expires, the Phosphoric Acid Plant will be sampled for particulate and total fluoride. Test procedures will be EPA reference methods 1, 2, 3, 4, 5, and 13A or 13B as published in 40 CFR 60, Appendix A, dated July 1, 1978, or by any other State approved methods. DER will be notified 30 days in advance of the compliance test. The test will be conducted at permitted production capacity $\pm 10\%$. Flow of the scrubber water (GPM), water pressure and pressure drop across the scrubbers, will be as normally operated and reported, along with the test data and results, to DER. Test results will be the average of 3 valid runs.

Minimum sample time and volume per run will be as defined in the applicable NSPS.

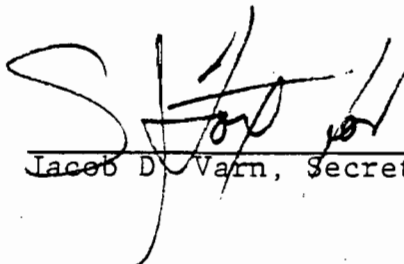
9. The applicant will demonstrate compliance with the conditions of the construction permit and submit a complete application for an operating permit to the Tampa District office prior to 90 days of the expiration date of the construction permit. The permittee may continue to operate in compliance with all terms of the construction permit until the expiration date or issuance of an operating permit.

PERMIT NO: AC 53- 34868

APPLICANT: Agrico Chemicals Company

Specific Conditions (cont'd)

10. Upon obtaining an operating permit, the applicant will be required to submit periodic test reports on the actual operation and emission of the facility. These reports will give emission test data, emission test results, scrubber parameters (pressure drop and water flow) and phosphoric acid production.
11. Stack sampling facilities will include the eyebolt and angle described in the attached figure.
12. The applicant shall install, calibrate and operate a monitoring device which can be used to determine the mass flow of phosphorus-bearing feed material to the process. The monitoring device shall have an accuracy of ± 5 percent over its operating range.
13. The applicant shall maintain a daily record of equivalent P_2O_5 feed by first determining the total mass rate in ton/hr. of phosphorus bearing feed using a monitoring device for measuring mass flow rate which meets the requirements of the above paragraph (14) and then by proceeding according to 40 CFR 60.204(d)(2) Subpart T, Standards of Performance for the Phosphate Fertilizer Industry: Wet Process Phosphoric Acid Plant.
14. The applicant shall install, calibrate, maintain, and operate a monitoring device which continuously measures and permanently records the total pressure drop across the process scrubbing system. The monitoring device shall have an accuracy of ± 5 percent over its operating range.


Jacob D. Varn, Secretary

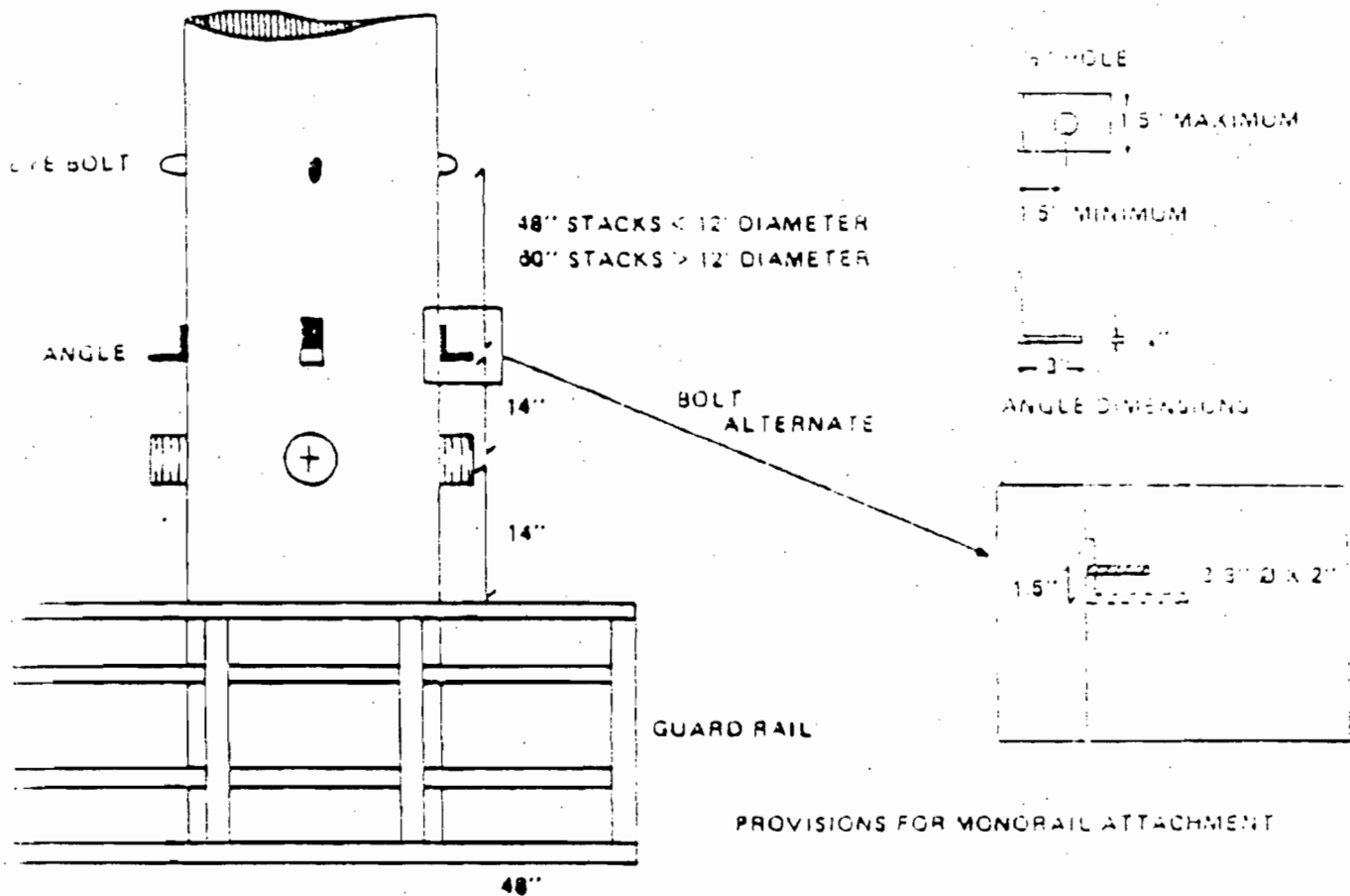
Expiration Date: June 30, 1982

Issued this 30 day of January, 19 81

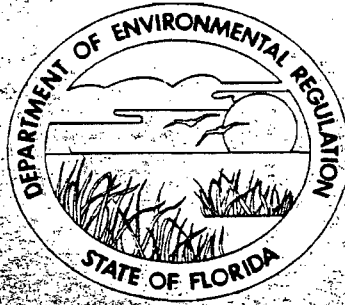
STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

BEST AVAILABLE COPY

AN EYEBOLT AND ANGLE SHALL BE ATTACHED DIRECTLY ABOVE EACH PORT OF VERTICAL STACKS AND ABOVE EACH VERTICAL SET OF PORTS FOUND ON THE SIDES OF HORIZONTAL DUCTWORK 1.8 WORKING PLATFORMS. THE DIMENSIONS AND PLACEMENT OF THESE FIXTURES ARE SHOWN IN FIGURE 1.1



IF EYEBOLT IS MORE THAN 120 INCHES ABOVE THE PLATFORM A PIECE OF CHAIN SHOULD BE ATTACHED TO IT TO BRING THE POINT OF ATTACHMENT WITHIN SAFE REACH. THE EYEBOLT SHOULD BE CAPABLE OF SUPPORTING A 500 POUND WORKING LOAD



**STATE OF FLORIDA
DEPARTMENT OF
ENVIRONMENTAL REGULATION**

**CONSTRUCTION
PERMIT**

NO. AC 53-34865

AGRICO CHEMICAL COMPANY
BARTOW, FLORIDA
DAP STORAGE AND SHIPPING FACILITY

DATE OF ISSUANCE

JANUARY 30, 1981

DATE OF EXPIRATION

JANUARY 30, 1983


JACOB D. VARN
SECRETARY

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301



BOB GRAHAM
GOVERNOR

JACOB D. VARN
SECRETARY

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

APPLICANT: Agrico Chemical Company
P. O. Box 1969
Bartow, Florida 33830

PERMIT/CERTIFICATION
NO. AC 53-34865

COUNTY: Polk

PROJECT: DAP plant storage
and shipping facility

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Chapter 17-2 and 17-4, Florida Administrative Code. The above named applicant, hereinafter called Permittee, is hereby authorized to perform the work or operate the facility shown on the approved drawing(s), plans, documents, and specifications attached hereto and made a part hereof and specifically described as follows:

For the construction of a 600,000 TPY DAP plant storage and shipping facility to be located at State Road 630, South Pierce, in Polk County, Florida. The UTM coordinates of the proposed plant are 407.4 km E and 3071.7 km N.

Construction shall be in accordance with the attached permit application and plans, documents and drawings, except as otherwise noted on page 3 "Specific Conditions".

Attachments are as follows:

1. Application to Construction Air Pollution Sources, DER Form 17-1.122(16).
2. Agrico Chemical Company, Responses to Technical Discrepancies, October 30, 1980.

PERMIT NO.: AC 53-34865
APPLICANT: Agrico Chemical Company

GENERAL CONDITIONS:

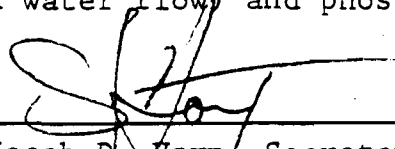
1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions", and as such are binding upon the permittee and enforceable pursuant to the authority of Section 403.161(1), Florida Statutes. Permittee is hereby placed on notice that the department will review this permit periodically and may initiate court action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.
2. This permit is valid only for the specific processes and operations indicated in the attached drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit shall constitute grounds for revocation and enforcement action by the department.
3. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately notify and provide the department with the following information: (a) a description of and cause of non-compliance; and (b) the period of non-compliance, including exact dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance. The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the department for penalties or revocation of this permit.
4. As provided in subsection 403.087(6), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.
5. This permit is required to be posted in a conspicuous location at the work site or source during the entire period of construction or operation.
6. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, which are submitted to the department, may be used by the department as evidence in any enforcement case arising under the Florida Statutes or department rules, except where such use is proscribed by Section 403.111, F.S.
7. In the case of an operation permit, permittee agrees to comply with changes in department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or department rules.
8. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, plant, or aquatic life or property and penalties therefore caused by the construction or operation of this permitted source, nor does it allow the permittee to cause pollution in contravention of Florida Statutes and department rules, except where specifically authorized by an order from the department granting a variance or exception from department rules or state statutes.
9. This permit is not transferable. Upon sale or legal transfer of the property or facility covered by this permit, the permittee shall notify the department within thirty (30) days. The new owner must apply for a permit transfer within thirty (30) days. The permittee shall be liable for any non-compliance of the permitted source until the transferee applies for and receives a transfer of permit.
10. The permittee, by acceptance of this permit, specifically agrees to allow access to permitted source at reasonable times by department personnel presenting credentials for the purposes of inspection and testing to determine compliance with this permit and department rules.
11. This permit does not indicate a waiver of or approval of any other department permit that may be required for other aspects of the total project.
12. This permit conveys no title to land or water, nor constitutes state recognition or acknowledgement of title, and does not constitute authority for the reclamation of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.
13. This permit also constitutes:
 - ☒ Determination of Best Available Control Technology (BACT)
 - ☒ Determination of Prevention of Significant Deterioration (PSD)
 - ☐ Certification of Compliance with State Water Quality Standards (Section 401, PL 92-500)

PERMIT NO: AC 53-34865
APPLICANT: Agrico Chemical Company

Specific Conditions

DAP storage and shipping facility

1. The maximum amount of particulate emissions will be 3.4 lb./hr.
2. The DAP storage and shipping facility will have a maximum storage capacity of 600,000 TPY. Maximum hourly input will be 100 TPH and maximum shipping output will be 200 TPH.
3. Maximum operating time will be 8,760 hours per year.
4. Reasonable precautions to prevent fugitive particulate emissions during construction such as coating or spraying roads and construction sites will be taken by the permittee.
5. Construction should reasonably conform to the plans submitted in the application.
6. The applicant should report any delays in construction and completion.
7. Before the construction permit expires, the DAP Storage and Shipping Facility scrubber will be sampled for particulate. Test procedures will be EPA reference methods 1, 2, 3, 4, and 5 as published in 40 CFR 60, Appendix A, dated July 1, 1978 or by any other State approved methods. DER will be notified 30 days in advance of the compliance test. The test will be conducted at permitted production capacity $\pm 10\%$.
8. The applicant will demonstrate compliance with the conditions of the construction permit and submit a complete application for an operating permit to the Tampa District office prior to 90 days of the expiration date of the construction permit. The permittee may continue to operate in compliance with all terms of the construction permit until the expiration date or issuance of an operating permit.
9. Upon obtaining an operating permit, the applicant will be required to submit periodic test reports on the actual operation and emissions of the facility. These reports will give emissions test data, emission test results, scrubber parameters (pressure drop and water flow) and phosphoric acid production.


Jacob D. Worn, Secretary

Expiration Date: January 30, 1983

Issued this 30 day of January 19 83

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION



STATE OF FLORIDA
DEPARTMENT OF
ENVIRONMENTAL REGULATION

CONSTRUCTION
PERMIT

NO. AC 53-34861

AGRICO CHEMICAL COMPANY
BARTOW, FLORIDA
DAP PLANT

DATE OF ISSUANCE

JANUARY 30, 1981

DATE OF EXPIRATION

JANUARY 30, 1983



JACOB D. VARN
SECRETARY

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301



BOB GRAHAM
GOVERNOR

JACOB D. VARN
SECRETARY

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

APPLICANT: Agrico Chemical Company
P. O. Box 1969
Bartow, Florida

PERMIT/CERTIFICATION
NO. AC 53-34861

COUNTY: Polk

PROJECT: DAP Plant

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Chapter 17-2 and 17-4, Florida Administrative Code. The above named applicant, hereinafter called Permittee, is hereby authorized to perform the work or operate the facility shown on the approved drawing(s), plans, documents, and specifications attached hereto and made a part hereof and specifically described as follows:

For the construction of a 100 TPH Diammonium Phosphate plant to be located at State Road 630, South Pierce, Polk County, Florida. The UTM coordinates of the proposed plant are 407.4 km E and 3071.7 km N.

Construction shall be in accordance with the attached permit application and plans, documents and drawings except as otherwise noted on page 3, "Specific Conditions".

Attachments are as follows:

1. Application to Construct Air Pollution Sources, DER Form 17-1.122(16).
2. Agrico Chemical Company, Responses to technical discrepancies, October 30, 1980.

PERMIT NO.: AC 53-34861
 APPLICANT: Agrico Chemical Company

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions", and as such are binding upon the permittee and enforceable pursuant to the authority of Section 403.161(1), Florida Statutes. Permittee is hereby placed on notice that the department will review this permit periodically and may initiate court action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.
2. This permit is valid only for the specific processes and operations indicated in the attached drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit shall constitute grounds for revocation and enforcement action by the department.
3. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately notify and provide the department with the following information: (a) a description of and cause of non-compliance; and (b) the period of non-compliance, including exact dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance. The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the department for penalties or revocation of this permit.
4. As provided in subsection 403.087(6), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.
5. This permit is required to be posted in a conspicuous location at the work site or source during the entire period of construction or operation.
6. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, which are submitted to the department, may be used by the department as evidence in any enforcement case arising under the Florida Statutes or department rules, except where such use is proscribed by Section 403.111, F.S.
7. In the case of an operation permit, permittee agrees to comply with changes in department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or department rules.
8. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, plant, or aquatic life or property and penalties therefore caused by the construction or operation of this permitted source, nor does it allow the permittee to cause pollution in contravention of Florida Statutes and department rules, except where specifically authorized by an order from the department granting a variance or exception from department rules or state statutes.
9. This permit is not transferable. Upon sale or legal transfer of the property or facility covered by this permit, the permittee shall notify the department within thirty (30) days. The new owner must apply for a permit transfer within thirty (30) days. The permittee shall be liable for any non-compliance of the permitted source until the transferee applies for and receives a transfer of permit.
10. The permittee, by acceptance of this permit, specifically agrees to allow access to permitted source at reasonable times by department personnel presenting credentials for the purposes of inspection and testing to determine compliance with this permit and department rules.
11. This permit does not indicate a waiver of or approval of any other department permit that may be required for other aspects of the total project.
12. This permit conveys no title to land or water, nor constitutes state recognition or acknowledgement of title, and does not constitute authority for the reclamation of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.
13. This permit also constitutes:
 - ☒ Determination of Best Available Control Technology (BACT)
 - ☒ Determination of Prevention of Significant Deterioration (PSD)
 - ☒ Certification of Compliance with State Water Quality Standards (Section 401, PL 92-500)

PERMIT NO. AC 53-34861
APPLICANT: Agrico Chemical Company

Specific Conditions

Diammonium phosphate plant

1. Maximum production rate will be 100 ton DAP/hr.
2. The emissions from the stack will not exceed:

Pollutant	Emission Rates
Particulate	0.5 lb/ton P_2O_5 input and 24.0 lb./hr.
SO_2	0.7 lb/ton P_2O_5 and 33.5 lb./hr.
Fluoride	0.06 lb/ton P_2O_5 input and 2.9 lb./hr.
3. Maximum operating time will be 7,884 hours per year.
4. Fugitive emissions from the process, conveying and storage equipment will be controlled by sealing and/or venting all particulate and fumes from the equipment to pollution abatement equipment.
5. No. 6 fuel oil used by the dryer shall contain no more than 2.25% sulfur.
6. The permittee will install, calibrate, maintain, operate and record data from flow monitoring devices used to determine total P_2O_5 input to the plant. A daily record on the P_2O_5 input to the plant will be maintained.
7. The permittee will measure and record the total pressure drop across each scrubber system. Pressure drop across the venturi scrubbers must be at least 12 inches of water during plant operations. These records will be maintained for 2 years and available for inspection by regulatory agency personnel on request.
8. Reasonable precautions to prevent fugitive particulate emissions during construction, such as coating or spraying roads and construction sites used by contractors, will be taken by the permittee.
9. Before the construction permit expires, the DAP plant will be sampled for particulate, sulfur dioxide and fluoride emissions. Test procedures will be EPA reference methods 1, 2, 3, 5, 6, and 13A or 13B as published in 40 CFR 60, Appendix A, dated July 1, 1978, or by any other state approved methods. DER will be notified 30 days in advance of the compliance test. The test will be conducted at permitted

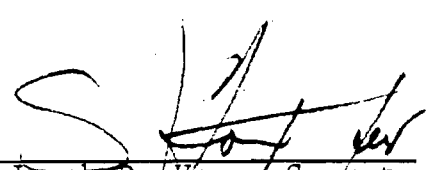
PERMIT NO.: AC-53-34861
APPLICANT: Agrico Chemical Company

Specific Conditions (cont'd)

production capacity $\pm 10\%$). P_2O_5 input, PH of scrubber solution, and pressure drop across the scrubbers, will be as normally operated and reported, along with the test data and results, to DER.

The applicant will demonstrate compliance with the conditions of this permit and submit a complete application for an operating permit to the S.W. DER office at least 90 days before the expiration date of this construction permit. The permittee may continue to operate in compliance with all terms of this permit until the expiration date or issuance of an operating permit.

10. Periodic emission tests or tests on request by DER at the source's expense will be a condition to any permit to operate. If the source can furnish a study on the permitted DAP plant showing a correlation between the emissions of any pollutant and plant operation parameters, the periodic emission test for that pollution may be waived by the Department.
11. Stack sampling facilities will include the angle and eyebolt shown in the attached figure.


Jacob D. Varn, Secretary

Expiration Date: January 30, 1983

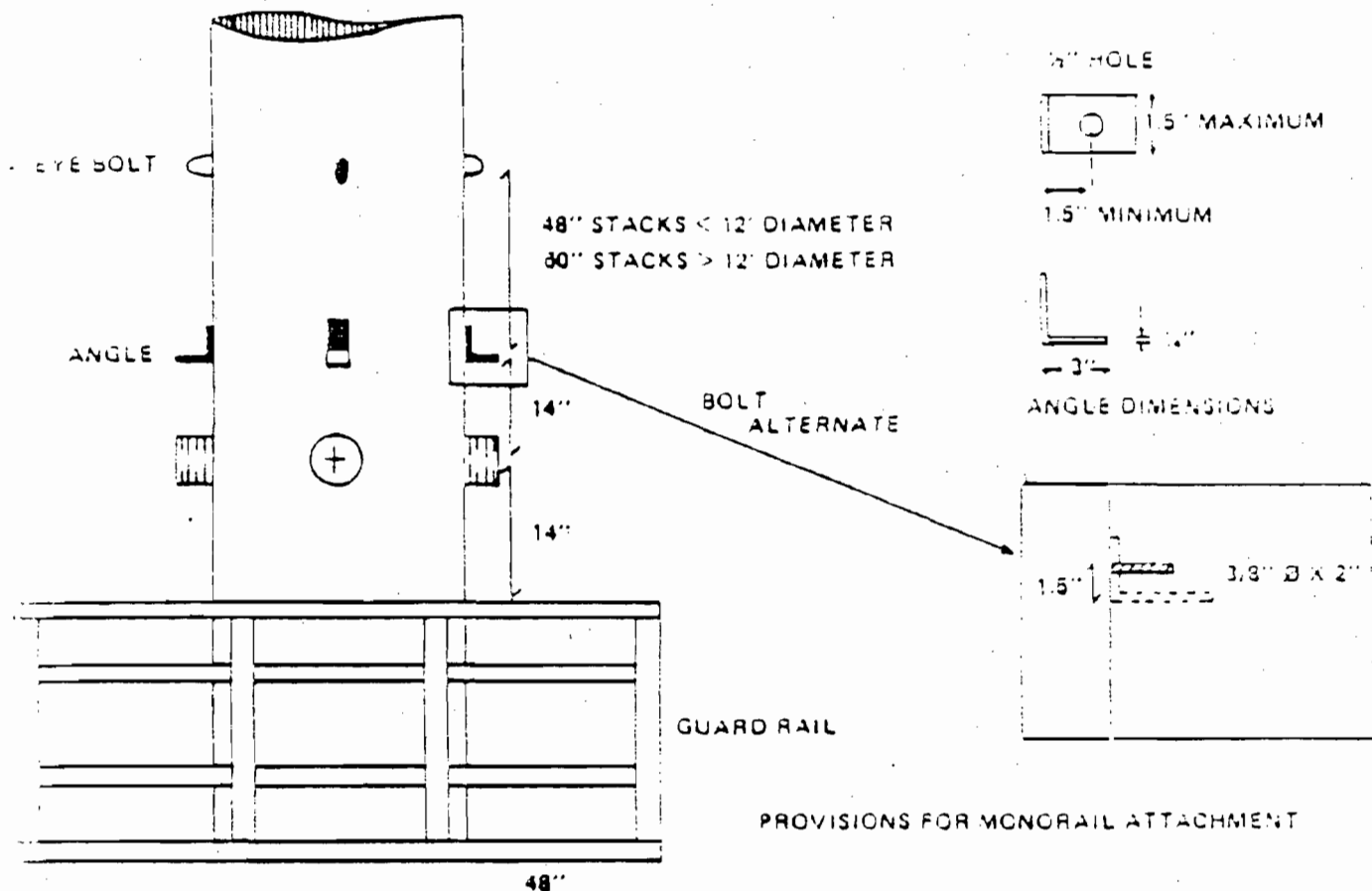
Issued this 30 day of

January 87
STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

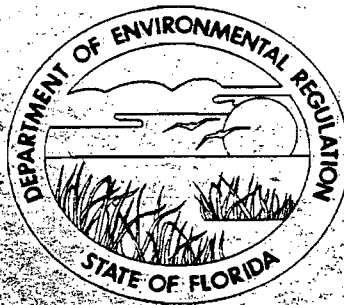
Under the conditions of the proposed expansion the fluoride emission rate from all point sources in the SPCW will decrease to approximately 40 tons per year. Since there will be an overall reduction in fluoride emissions from point sources and since the emissions from the ponds will increase only slightly (approximately five tons per year) it is doubtful that any fluoride related impacts will be observed in the future.

BEST AVAILABLE COPY

AN EYEBOLT AND ANGLE SHALL BE ATTACHED DIRECTLY ABOVE EACH PORT OF VERTICAL STACKS AND ABOVE EACH VERTICAL SET OF PORTS FOUND ON THE SIDES OF HORIZONTAL DUCTWORK 1.8 WORKING PLATFORMS. THE DIMENSIONS AND PLACEMENT OF THESE FIXTURES ARE SHOWN IN FIGURE 1.1.



IF EYEBOLT IS MORE THAN 120 INCHES ABOVE THE PLATFORM A
PIECE OF CHAIN SHOULD BE ATTACHED TO IT TO BRING THE POINT
OF ATTACHMENT WITHIN SAFE REACH. THE EYEBOLT SHOULD BE
CAPABLE OF SUPPORTING A 500 POUND WORKING LOAD.



STATE OF FLORIDA
DEPARTMENT OF
ENVIRONMENTAL REGULATION

CONSTRUCTION
PERMIT

NO. AC 53-34871

AGRICO CHEMICAL COMPANY
BARTOW, FLORIDA
SULFURIC ACID PLANT

DATE OF ISSUANCE

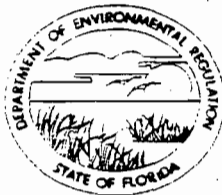
JANUARY 30, 1981

DATE OF EXPIRATION

MARCH 30, 1981


JACOB D. VARN
SECRETARY

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301



BOB GRAHAM
GOVERNOR

JACOB D. VARN
SECRETARY

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

APPLICANT: Agrico Chemical Company
P. O. Box 1969
Bartow, Florida 33830

PERMIT/CERTIFICATION
NO. AC 53-34871

COUNTY: Polk

PROJECT: Sulfuric Acid Plant

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Chapter 17-2 and 17-4, Florida Administrative Code. The above named applicant, hereinafter called Permittee, is hereby authorized to perform the work or operate the facility shown on the approved drawing(s), plans, documents, and specifications attached hereto and made a part hereof and specifically described as follows:

For the construction of a 2000 TPD Sulfuric Acid Plant to be located at State Road 630, South Pierce, in Polk County, Florida. The UTM Coordinates of the proposed plant are 407.6 km E and 3071.3 km N.

Construction shall be in accordance with the attached permit application and plans, documents and drawings except as otherwise noted on page 3, "Specific Conditions".

Attachments are as follows:

1. Application to construct Air Pollution Sources, DER Form 17-1.122(16).
2. Agrico Chemical Company Responses to Technical Discrepancies, October 30, 1980.

PERMIT NO.: AC 53-34871
APPLICANT: Agrico Chemical Company

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions", and as such are binding upon the permittee and enforceable pursuant to the authority of Section 403.161(1), Florida Statutes. Permittee is hereby placed on notice that the department will review this permit periodically and may initiate court action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.

2. This permit is valid only for the specific processes and operations indicated in the attached drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit shall constitute grounds for revocation and enforcement action by the department.

3. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately notify and provide the department with the following information: (a) a description of and cause of non-compliance; and (b) the period of non-compliance, including exact dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance. The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the department for penalties or revocation of this permit.

4. As provided in subsection 403.087(6), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.

5. This permit is required to be posted in a conspicuous location at the work site or source during the entire period of construction or operation.

6. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, which are submitted to the department, may be used by the department as evidence in any enforcement case arising under the Florida Statutes or department rules, except where such use is proscribed by Section 403.111, F.S.

7. In the case of an operation permit, permittee agrees to comply with changes in department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or department rules.

8. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, plant, or aquatic life or property and penalties therefore caused by the construction or operation of this permitted source, nor does it allow the permittee to cause pollution in contravention of Florida Statutes and department rules, except where specifically authorized by an order from the department granting a variance or exception from department rules or state statutes.

9. This permit is not transferable. Upon sale or legal transfer of the property or facility covered by this permit, the permittee shall notify the department within thirty (30) days. The new owner must apply for a permit transfer within thirty (30) days. The permittee shall be liable for any non-compliance of the permitted source until the transferee applies for and receives a transfer of permit.

10. The permittee, by acceptance of this permit, specifically agrees to allow access to permitted source at reasonable times by department personnel presenting credentials for the purposes of inspection and testing to determine compliance with this permit and department rules.

11. This permit does not indicate a waiver of or approval of any other department permit that may be required for other aspects of the total project.

12. This permit conveys no title to land or water, nor constitutes state recognition or acknowledgement of title, and does not constitute authority for the reclamation of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.

13. This permit also constitutes:

- ☒ Determination of Best Available Control Technology (BACT)
- ☒ Determination of Prevention of Significant Deterioration (PSD)
- ☒ Certification of Compliance with State Water Quality Standards (Section 401, PL 92-500)

PERMIT NO. AC 53-34871

APPLICANT: Agrico Chemical Company

Specific ConditionsSulfuric Acid Plant

1. Maximum operation time will be 8,400 hours per year.
2. Maximum production rate will be 2,000 ton per day of 100% sulfuric acid and 83.33 TPH.
3. The maximum amount of sulfur dioxide emitted will be 4 lb. SO_2 /ton 100% H_2SO_4 and 333.3 lb. SO_2 /hr.
4. The amount of H_2SO_4 mist emitted will be a maximum of 0.15 lb. acid mist/ton 100% H_2SO_4 and 12.5 lb. acid/hr.
5. A continuous monitoring system for the measurement of sulfur dioxide shall be installed, calibrated, maintained, and operated by the applicant. The pollutant gas used to prepare calibration gas mixture under paragraph 2.1 Performance Specification 2 and for calibration checks under 40 CFR 60.13(d) shall be sulfur dioxide (SO_2). Reference Method 8 shall be used for conducting monitoring system performance evaluations under 40 CFR 60.13(c) except that only the sulfur dioxide portion of the Method 8 results shall be used. The span shall be set at 1000 ppm of sulfur dioxide.
6. The applicant shall establish a conversion factor for the purpose of converting monitoring data into units of the applicable standard (kg/metric ton, lb./short ton). The conversion factor shall be determined, as a minimum, three times daily by measuring the concentration of sulfur dioxide entering the converter using suitable methods and calculating the appropriate conversion factor for each eight hour period as follows:

$$\text{CF} = \text{K} \frac{(1.000 - 0.015r)}{r-s}$$

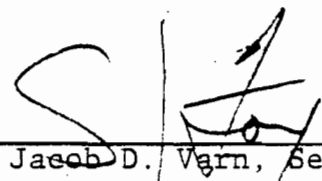
where CF, K, r, and s are defined as in 40 CFR 60.84(b).

7. The applicant shall record all conversion factors and values under paragraph (b) as set forth in 40 CFR 60.84 Subpart H - Standards of Performance for Sulfuric Acid Plant.
8. For the purpose of reports under 40 CFR 60.7(c), periods of excess emission shall be all three-hour periods (or the arithmetic average of three consecutive one-hour periods) during which the integrated average sulfur dioxide emissions exceed the applicable standards under 40 CFR 60.82.

PERMIT NO: AC 53-34871
APPLICANT: Agrico Chemical Company

Specific Conditions (cont'd)

9. Reasonable precautions to prevent fugitive particulate emissions during construction such as coating or spraying roads and construction sites used by contractors, will be taken by the Permittee.
10. Construction should reasonably conform to the plans submitted in the application.
11. The applicant should report any delays in construction and completion.
12. Before the construction permit expires the sulfuric acid plant will be tested for visible emissions, sulfur dioxide and sulfuric acid mist. Test procedures will be EPA reference methods 1, 2, 3, 8, and 9 as published in 40 CFR 60, Appendix A, dated July 1, 1978 or by any other State approved method. Minimum sample volume and time per run will be as defined in the applicable NSPS. DER will be notified 30 days in advance of the compliance test. The test will be conducted at permitted production capacity $\pm 10\%$.
13. The applicant will demonstrate compliance with the condition of the construction permit and submit a complete application for an operating permit to the Tampa District office prior to 90 days of the expiration date of the construction permit. The permittee may continue to operate in compliance with all terms of the construction permit until the expiration date or issuance of an operating permit.
14. Upon obtaining an operating permit, the applicant will be required to submit periodic test reports on the actual operation and emissions of the facility.
15. Stack sampling facilities will include the eyebolt and angle described in the attached figures.
16. Visible emission shall not exceed 10% opacity.



Jacob D. Varn, Secretary

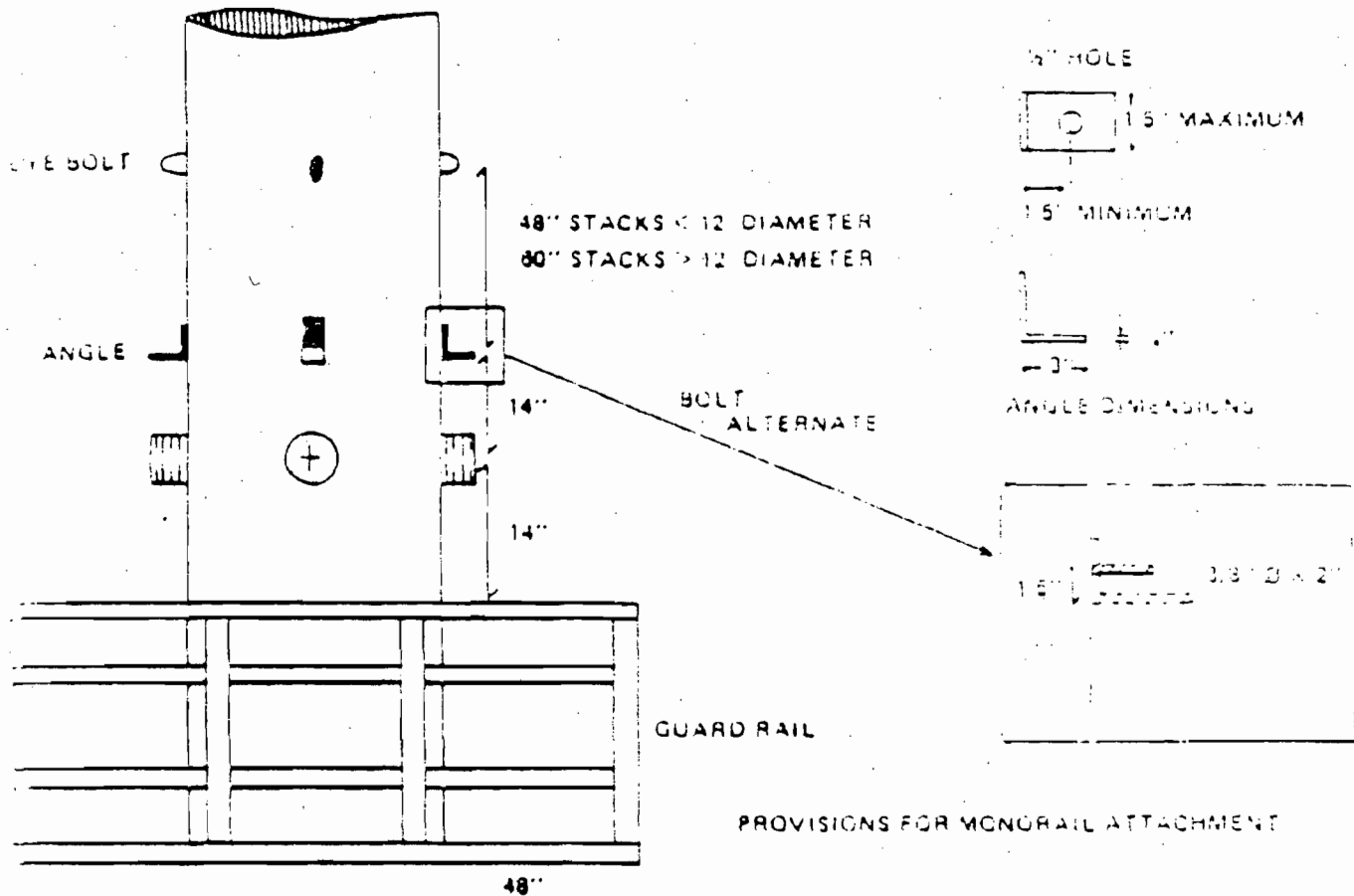
Expiration Date: March 30, 1983

Issued this 30 day of January 19 81

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

BEST AVAILABLE COPY

AN EYEBOLT AND ANGLE SHALL BE ATTACHED DIRECTLY ABOVE EACH PORT OF VERTICAL STACKS AND ABOVE EACH VERTICAL SET OF PORTS FOUND ON THE SIDES OF HORIZONTAL DUCTWORK 1.8 WORKING PLATFORMS. THE DIMENSIONS AND PLACEMENT OF THESE FIXTURES ARE SHOWN IN FIGURE 1.1



IF EYEBOLT IS MORE THAN 120 INCHES ABOVE THE PLATFORM A PIECE OF CHAIN SHOULD BE ATTACHED TO IT TO BRING THE POINT OF ATTACHMENT WITHIN SAFE REACH. THE EYEBOLT SHOULD BE CAPABLE OF SUPPORTING A 500 POUND WORKING LOAD.

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301



BOB GRAHAM
GOVERNOR

JACOB D. VARN
SECRETARY

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

M E M O R A N D U M

TO: Mr. J.C. Lahman, Plant Manager, Agrico Chemical Company
Mr. William Hennessey, District Manager, Southwest District

FROM: *Steve Smallwood for*
Steve Smallwood, Chief, Bureau of Air Quality Management

DATE: December 24, 1980

SUBJ: Proposed Permits - Agrico Chemical Company - Applications
for Permits to Construct a Sulfuric Acid Plant, DAP Plant,
and DAP Storage and Shipping Facility and to Modify a
Phosphoric Acid Plant.

Attached are copies of the Applications, Technical Evaluation and Preliminary Determination, BACT Determination and proposed permits to construct a sulfuric acid plant, DAP plant, and DAP storage and shipping facility and to modify a phosphoric acid plant at the Agrico Chemical Company plant on State Road 630, Polk County.

Please send any comments that you wish to have considered concerning this action, in writing, to Willard Hanks of the Bureau of Air Quality Management.

SS:dav

Technical Evaluation
and
Preliminary Determination

Agrico Chemical Company
South Pierce Facility
Polk County, Florida

Construction Permit

Application Numbers:

AC 53-34868
AC 53-34861
AC 53-34865
AC 53-34871

Florida Department of Environmental Regulation

Bureau of Air Quality Management

Central Air Permitting

December 9, 1980

Construction Notice

THE DEPARTMENT OF ENVIRONMENTAL REGULATION (DER) has received an application from and intends to issue Construction Permits to Agrico Chemical Company for the construction of a sulfuric acid plant, a Diammonium phosphate plant (DAP), a DAP plant storage and shipping facility and a modification of a phosphoric acid plant, to be located at State Road 630, Polk County, Florida. A determination of Best Available Control Technology was required. Copies of the application, BACT Determination, Technical Evaluation and Departmental Intent are available for public inspection at the following offices: Department of Environmental Regulation, Southwest District, 7601 Highway 301 North, Tampa, Florida 33601, Department of Environmental Regulation, Bureau of Air Quality Management, 2600 Blair Stone Road, Tallahassee, Florida 32301. Procedures for filing comments or requesting a hearing on this action are described in the Technical Evaluation.

I. PROPOSED DEPARTMENT ACTION:

The Department intends to issue the requested permits to Agrico Chemical Company to construct a sulfuric acid plant, a DAP plant, DAP storage and shipping facility and to modify the phosphoric acid plants at its complex located at State Road 630, South Pierce, Polk County, Florida. The permits will include conditions to assure compliance with Chapter 17-2, FAC.

Any person wishing to comment on this proposed action may do so by submitting such comments in writing to:

Willard Hanks
Florida Department of Environmental Regulation
Bureau of Air Quality Management
2600 Blair Stone Road
Tallahassee, Florida 32301

Any person whose substantial interest would be affected by the issuance of these permits may request an administrative hearing by filing a petition for hearing as set forth in Section 28-5.15 (copy attached). Such petition must be filed within 14 days of the date this notice is published. Such petition is to be filed with:

Mary Clark
Office of General Counsel
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

II. SUMMARY OF EMISSIONS AND AIR QUALITY ANALYSIS:

a. The location of the proposed sources at State Road 630, Polk County, is approximately 39 kms. southeast of the boundary of the Hillsborough County particulate nonattainment area. This places the proposed sources within the area of influence of that nonattainment area. The location is "unclassifiable" for the criteria pollutant particulate and attainment for the remaining criteria pollutants.

b. The sources will emit fluoride, sulfuric acid mist, sulfur dioxide and particulate.

c. Best Available Control Technology (BACT) for the Sulfuric acid plant is 4 lb. SO_2 /tons 100% H_2SO_4 and 0.15 lbs. acid mist/tons 100% H_2SO_4 , achieved by using a double absorption type acid plant.

BACT for the phosphoric acid plants is determined to be 0.02 lb F/ton P_2O_5 when using cross-flow packed scrubbers as control device.

BACT for the DAP plant is the following emission levels: fluoride 0.06 lb./ton P_2O_5 input, particulate matter 0.5 lb./ton P_2O_5 input, sulfur dioxide 0.7 lb./ton P_2O_5 input to be achieved with a coaxial venturi scrubber and a tail gas scrubber in series.

BACT for the DAP storage and shipping facility is 0.015 grains/DSCF for particulate matter.

d. Modeling results indicate that no violation of particulate or sulfur dioxide increments and ambient air quality standards will occur.

III. SYNOPSIS OF APPLICATIONS:

a. Name and Address of Applicant:

Agrico Chemical Company
P. O. Box 1969
Bartow, Florida 33830

b. Description of Project and Controls:

This project is the proposed construction of a sulfuric acid plant, a DAP plant including storage and shipping facilities and a modification to the existing phosphoric acid plants.

A coaxial venturi scrubber/separator on the reactor-granulator, dryer and cooler systems followed by either a vertical counter-current flow or a horizontal cross-flow packed tail gas scrubber have been proposed to control emissions from the DAP plant.

Particulate matter emission from the DAP storage and shipping facility will be controlled by a venturi or impingement scrubber.

In the sulfuric acid plants, emissions of sulfur dioxide and sulfuric acid mist will be controlled with a double adsorption system and mist eliminator.

In the phosphoric plants the existing cross-flow packed scrubbers will be used to control fluoride emissions.

c. Descriptions of Processes, Proposed Processes Rates and Emission Rates:

Sulfuric Acid Plants

The principal steps in the process consist of burning sulfur(S) in air to form sulfur dioxide (SO_2), combining the sulfur dioxide with oxygen (O_2) to form sulfur trioxide (SO_3), and absorbing the sulfur trioxide in water (H_2O) to form sulfuric acid (H_2SO_4).

The new double absorption contact sulfuric acid plant will have a capacity of 2000 tons per day of 100% sulfuric acid. An existing 165 MMBTU/hr. package boiler will be used to start up the sulfuric acid plant.

DAP Plant, Storage and Shipping Facility

Diammonium phosphate is manufactured from phosphoric acid and ammonia. The process consists of three basic steps: reaction, granulation and finishing operations such as drying, cooling, and screening.

A DAP storage and shipping facility with a capacity of 600,000 TPY DAP will be constructed. Capability for shipping by rail and truck will be provided. Particulate emissions will be controlled with a scrubber.

Phosphoric Acid Plant

Phosphoric acid is produced by reacting ground phosphate rock with sulfuric acid. This reaction produces phosphoric acid and gypsum. $\text{Ca}_3(\text{PO}_4)_2 + \text{H}_2\text{SO}_4 + 6\text{H}_2\text{O} \rightarrow 3(\text{CaSO}_4 \cdot 2\text{H}_2\text{O}) + 2\text{H}_3\text{PO}_4$.

All process types consist of three major steps: reaction, filtration and evaporation. The existing phosphoric acid plants will be modified by adding additional evaporation capacity to increase production from 430,000 TPY to 625,000 TPY.

The following table outlines the proposed emission rates for the above sources:

Unit	Pollutants (lb/hr)				
	NO _x	Particulate	SO ₂	H ₂ SO ₄ mist	Fluoride
Sulfuric Acid Plant	14.0	N/A	333.3	12.5	N/A
Phosphoric Acid Plant	N/A	N/A	N/A	N/A	2.22
DAP Plant	8.1	24.0	33.5	N/A	2.9
DAP, storage and shipping	N/A	3.4	N/A	N/A	N/A

The stack parameters are as follow:

	DAP Plant	Sulfuric Acid Plant	Phosphoric Acid Plant	DAP storage and shipping	Units
	Train "A"		Train "B"		
Stack Height	125	150	120	100	125 ft.
Gas flow rate	225,000	133,000	67,000	70,000	30,000 ACFM

	DAP Plant	Sulfuric Acid Plant	Phosphoric Acid Plant	DAP storage and shipping	Units
			Train "A"	Train "B"	
Water vapor content	12	0	8	8	5 %
Stack Diameter	10	9.5	6.33	5.0	3.5 ft.
Gas Exit Temperature	130	170	115	115	115 °F
Velocity	47.8	31.3	35.5	59.4	52.0 FPS

IV. RULE APPLICABILITY:

The sources comprise a major emitting facility for fluoride, particulate and sulfur dioxide as defined in Chapter 17-2 FAC because the potential emissions exceed 100 TPY. The projects are subject to provisions of 17-2.05(6) Table II, item B(2) for the sulfuric acid plant, item C(1)(a) for the wet phosphoric acid plants and item C(1)(f) for the diammonium phosphate plant and auxiliary equipment.

The project is subject to 17-2.03(1) which requires the use of Best Available Control Technology (BACT) and 17-2.04(6) which requires a Prevention of Significant Deterioration (PSD) review.

Mathematical modeling for determination of maximum particulate emissions impacts on the Hillsborough County nonattainment area indicates that the proposed project will not have a significant impact on the area and is, therefore, exempt from the requirements of 17-2.17, 17-2.18, and 17-2.19.

V. FINDING:

Best Available Control Technology (BACT) has been determined as required by 17-2.03 for fluoride, particulate, sulfur dioxide and sulfuric acid mist emissions from the proposed sources.

The standards selected as BACT, which will be the permitted emissions through the stacks, are listed below:

DAP Plant Emission Limits:

Particulates - 0.5 lb. per ton P_{2O_5} input
Sulfur Dioxide - 0.7 lb. per ton P_{2O_5} input
Fluorides - 0.06 lb. per ton P_{2O_5} input.

Page Five

Phosphoric Acid Plant:

Fluorides 0.02 lb. per ton P_2O_5 input

DAP Storage and Shipping Facility:

Effluent Particulates - 0.015 grains per DSCF

Sulfuric Acid Plant:

Sulfur Dioxide - 4.0 lb. per ton 100% acid

Acid Mist - 0.15 lb. per ton 100% acid

Visible Emissions - 10% maximum opacity

Other findings are as follows:

Sulfuric Acid Plant

1. The proposed facility is a major emitting facility for SO_2 and H_2SO_4 mist because the potential emissions of each are greater than 100 tons per year.
2. The proposed facility is not a major emitting facility for nitrogen oxides or carbon monoxide as uncontrolled emissions of each are less than 100 tons per year.
3. Modeling results conclude no violations of the PSD or ambient air standards for SO_2 will occur.
4. The installation of the double absorption system and mist eliminator will minimize the discharge of sulfur dioxide and sulfuric acid mist from the sulfuric acid plant.
5. An existing 165 MMBTU/hr. package boiler will be used with the sulfuric acid plant.

Phosphoric Acid Plant

1. The existing phosphoric acid plants will be modified by adding additional evaporation capacity to increase production.
2. The existing phosphoric acid plants are a major fluoride emitting facility since the total potential fluoride emissions are more than 100 tons per year.
3. The existing phosphoric acid plants are not major emitting facilities for particulate since uncontrolled emissions are less than 100 tons per year.
4. Since wet phosphate rock is used for phosphoric acid production, particulate matter emissions are minimized.
5. The "A" and "B" phosphoric acid trains are presently equipped with cross-flow packed scrubbers which have proven compliance with NSPS and which are of sufficient size to accommodate the proposed modification without alteration.

6. The fluoride emissions from the proposed modification are not expected to create any adverse secondary impacts.
7. Under the conditions of the proposed expansion, the fluoride emission rate from all point sources in the complex will decrease to approximately 40 tons per year.

Diammonium Phosphate Plant

1. The DAP plant is a major emitting facility for particulate, fluoride and sulfur dioxide because the potential emissions of these pollutants are more than 100 tons per year.
2. The DAP plant scrubber water will recirculate through a new retention pond which will not require discharge except during periods of excessive rainfall.
3. Modeling results conclude no violations of the PSD increments or ambient air standards for particulate and SO₂ will occur.
4. There is no solid waste from the DAP plant. Liquid wastes is recirculated through a retention pond. Negative water balance results in no discharge from pond except during periods of excessive rainfall.
5. The DAP plant will also be utilized for the production of MAP.
6. A coaxial venturi scrubber followed by either a vertical counter-current flow or a horizontal cross-flow packed tail gas scrubber will be used to control emissions.

DAP Storage and Shipping Facilities

1. The proposed facility is a major emitting facility for particulate since the potential emissions are more than 100 tons per year.
2. All transfer points will be vented and ducted to a common scrubber for particulate control.
3. The storage and shipping facility will be designed to store and ship the product from the proposed DAP plant; 600,000 TPY.
4. The maximum load-out rate will be 200 TPH.
5. The maximum rate at which DAP will be transferred into storage is 100 TPH.
6. A Venturi or impingement scrubber has been proposed as the control device for the facility.

VI. Proposed Allowable Emissions and Permit Conditions:

See Draft Permit

RULES OF THE ADMINISTRATIVE COMMISSION
MODEL RULES OF PROCEDURE
CHAPTER 28-5
DECISIONS DETERMINING SUBSTANTIAL INTERESTS

28-5.15 Requests for Formal and Informal Proceedings

- (1) Requests for proceedings shall be made by petition to the agency involved. Each petition shall be printed typewritten or otherwise duplicated in legible form on white paper of standard legal size. Unless printed, the impression shall be on one side of the paper only and lines shall be double spaced and indented.
- (2) All petitions filed under these rules should contain:
 - (a) The name and address of each agency affected and each agency's file or identification number, if known;
 - (b) The name and address of the petitioner or petitioners;
 - (c) All disputed issues of material fact. If there are none, the petition must so indicate;
 - (d) A concise statement of the ultimate facts alleged, and the rules, regulations and constitutional provisions which entitle the petitioner to relief;
 - (e) A statement summarizing any informal action taken to resolve the issues, and the results of that action;
 - (f) A demand for the relief to which the petitioner deems himself entitled; and
 - (g) Such other information which the petitioner contends is material.

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

INTEROFFICE MEMORANDUM

For Routing To District Offices And/Or To Other Than The Addressee		
To: _____	Locn.: _____	
To: _____	Locn.: _____	
To: _____	Locn.: _____	
From: _____	Date: _____	
Reply Optional []	Reply Required []	Info. Only []
Date Due: _____	Date Due: _____	

TO: Ed Palagyi
FROM: Bob King *B. King*
DATE: November 25, 1980
SUBJ: BACT Determination - Agrico Chemical Company

1. For the phosphoric acid plant, I agree with the applicants' proposal, 0.02 lbs fluorides per ton of P_2O_5 input, which is the NSPS for this type of source.
2. For the sulfuric acid plant, I agree with the applicants' proposal as follows:

Sulfur Dioxide	4.0 lbs/ton 100% acid produced
Acid Mist	0.15 lb/ton 100% acid produced

which is the NSPS for this type of source.
3. For the DAP plant, I recommend the BACT as follows:

Fluorides	0.06 lb/ton P_2O_5 input
Particulate Matter	0.4 lb/ton P_2O_5 input
Sulfur Dioxide	0.5 lb/ton P_2O_5 input

Based on EPA report (600/2-79-169), particulate emission rate from DAP plant can be low as 0.3 lb/ton P_2O_5 input.
4. For DAP storage and shipping, I agree with applicants' proposal, 0.015 grains/SCF, as the BACT.

BK:dav

BEST AVAILABLE COPY

THE TAMPA TRIBUNE

Published Daily
Tampa, Hillsborough County, Florida

State of Florida }
County of Hillsborough } ss.

Before the undersigned authority personally appeared
J. F. Urbanski, who on oath says that he is Vice President and General Manager of The Tampa Tribune, a daily newspaper published at Tampa in Hillsborough County, Florida; that the attached copy of advertisement being a

-----LEGAL NOTICE-----

in the matter of The Dept. of Environmental Regulation has received
an application from and intends to issue Construction Permits to
Agrico Chemicals Co.-----

was published in said newspaper in the issues of January 1, 1981-----

Affiant further says that the said The Tampa Tribune is a newspaper published at Tampa, in said Hillsborough County, Florida, and that the said newspaper has heretofore been continuously published in said Hillsborough County, Florida, each day and has been entered as second class mail matter at the post office in Tampa, in said Hillsborough County, Florida, for a period of one year next preceding the first publication of the attached copy of advertisement; and affiant further says that he has neither paid nor promised any person, firm, or corporation any discount, rebate, commission or refund for the purpose of securing this advertisement for publication in the said newspaper.

Sworn to and subscribed before me, this 15th day
of January, A.D. 1981.

(SEAL)

Notary Public State of Florida at Large
My Commission Expires July 7, 1983.

Construction Notice
THE DEPARTMENT OF ENVIRONMENTAL REGULATION (DER) has received an application from and intends to issue Construction Permits to Agrico Chemicals Company for the construction of a sulfuric acid plant, a Diammonium phosphate plant (DAP), a DAP plant storage and shipping facility and a modification of a phosphoric acid plant, to be located at State Road 630, Polk County, Florida. A determination of Best Available Control Technology was required. Copies of the application, BACT Determination, Technical Evaluation and Departmental Intent are available for public inspection at the following offices: Department of Environmental Regulation, Southwest District, 7601 Highway 301 North, Tampa, Florida 33601, Department of Environmental Regulation, Bureau of Air Quality Management, 2600 Blair Stone Road, Tallahassee, Florida 32301. Procedures for filing comments or requesting a hearing on this action are described in the Technical Evaluation.
M2008 Jan. 1, 1981

PURCHASING

APPLICATION FOR FDER CONSTRUCTION PERMITS

AGRICO CHEMICAL COMPANY
SOUTH PIERCE CHEMICAL WORKS
POLK COUNTY, FLORIDA

EXISTING POLK COUNTY
AMBIENT SULFUR DIOXIDE MONITORING SUMMARY

AUGUST 29, 1980

SUMMARY OF POLK COUNTY AMBIENT SULFUR DIOXIDE MONITORING

During the period January 1977 through January 1978, Sholtes & Koogler Environmental Consultants conducted an ambient sulfur dioxide monitoring program for W.R.Grace in southwest Polk County, Florida. The network consisted of four (4) monitoring sites located as shown in the attached figures. The samples were collected by the EPA Reference Method (40 CFR 50, Appendix A). Each of the four samplers were temperature controlled.

The criteria used for establishing the monitoring site locations is detailed in the attached correspondence. Basically, the monitoring sites were selected using as criteria: (1) the results of an air quality modelling study conducted for W.R.Grace (See Attachments); and (2) the availability of electric power and security for the monitors.

The monitoring network was approved by the Florida Department of Environmental Regulation and was inspected and found satisfactory by representatives of that agency (see attached correspondence).

The results of the monitoring program which are detailed in the attached report, indicated that ambient 24-hour sulfur dioxide levels in southwest Polk County were well within the applicable Florida Air Quality Standard.

During the operation of the monitoring program, various quality assurance measures were incorporated to insure the validity of the monitoring data. The monitors were serviced during each six-day period by a field technician who recorded the necessary field data and inspected monitoring sites. Attached are sample copies of the field data sheets and a copy of the checklist the field technician followed. Although it is not specifically recorded on the field data sheet, the temperature of the container housing the sulfur dioxide bubbler tubes was checked each time the site was visited. The field technician had specific instructions to record on the data sheet any instance when the bubbler temperature exceeded 50° F.

The exposed absorbing solution was recovered from each monitoring site and stored for a period of three weeks at a temperature below 50° F. When three sets of samples were accumulated they were packed in a refrigerated container and shipped by United Parcel Service to the analytical laboratory in Jacksonville. A thermometer was packed with the samples.

Upon receipt at the laboratory the temperature of the samples was recorded and the samples transferred to refrigeration (4°C) until the samples were analyzed. Analysis took place within one week after receipt of the samples. This schedule was such that no one sample was held longer than 30 days before analysis.

During the analysis of the samples which was conducted on a Technicon Automatic Analyzer, approximately five percent (5%) blanks and five percent (5%) spike samples were run.

The laboratory data including the percent transmittance for each sample and the total micrograms of sulfur dioxide in each sample were forwarded to SKEC. The field technician likewise forwarded the field data sheets and orifices used for controlling the flow through the sampler to SKEC.

It should be noted that orifices were calibrated before and after each sample was run.

At SKEC the sulfur dioxide concentrations were calculated and orifices recalibrated and returned to the field technician.

Periodically spot checks were made on the sulfur dioxide concentration calculations by principals of SKEC.

The laboratory, Southern Analytical Laboratories, Inc., has participated for several years in the EPA Quality Assurance Program for Ambient Sulfur Dioxide Sample Analysis. The success of the laboratory in analyzing the unknown samples has been very good.

AMBIENT AIR SULFUR DIOXIDE
MONITORING NETWORK

JANUARY 1977 - JANUARY 1978

W.R. GRACE AND COMPANY
BARTOW, FLORIDA

SHOLTES & KOOGLER
ENVIRONMENTAL CONSULTANTS
1213 NW 6th Street
Gainesville, FL 32601
(904) 377-5822

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I. INTRODUCTION

Commencing January 19, 1977 and continuing through January 8, 1978, Sholtes & Koogler Environmental Consultants (SKEC) of Gainesville, Florida operated and maintained an ambient air sulfur dioxide monitoring network for W.R. Grace and Company in Polk County, Florida. The sampling was required of W.R. Grace by the Florida Department of Environmental Regulation (FDER) as a proviso on a construction permit for a sulfuric acid plant. The samples were collected by the EPA Reference Method (40 CFR 50, Appendix A). During this period a total of 239 out of a possible 240 samples were collected for data retrieval of 99.6 percent.

Of the 239 samples which were collected only two samples exceeded the minimum detectable limit for the sampling method of 25 micrograms per cubic meter. The maximum observed 24-hour concentration was on August 29, 1977 at Station No. 2. The concentration was 214.8 micrograms per cubic meter. The second highest concentration was also at Station 2 on April 19, 1977. The concentration was 92.0 micrograms per cubic meter. These compared to the Florida Department of Environmental Regulation (FDER) 24-hour SO_2 standard of 260 micrograms per cubic meter not to be exceeded more than once per year. It is suspected that the two high measured SO_2 levels resulted from a plant upset rather than from normal plant operation. The location of the upset was not investigated by SKEC.

The arithmetic average of the samples for each of the stations were all less than 10 micrograms per cubic meter. This compares with the annual FDER SO₂ standard of 60 micrograms per cubic meter. Table 1 is a summary of the sampling results observed at each site along with the arithmetic average for each station for the period in which these samples were collected. A tabulation of all sampling data is presented in the Appendix.

II. SULFUR DIOXIDE SAMPLING PROCEDURE

Ambient sulfur dioxide samplers were located at stations No. 1 through 4 shown in Figure 1. The samplers were operated on a six day schedule corresponding to the schedule adopted by FDER and the U.S. Environmental Protection Agency (EPA). Sulfur dioxide sampling was conducted using the EPA Reference Method (pararosaniline method) as outlined in the Federal Register (Volume 36, No. 21, Appendix A, January 30, 1971). The samplers were temperature controlled.

The method involves the placement of 50 mililiters of a potassium tetrachloromercurate (TCM) solution in a polypropylene absorber and sampling at a constant rate of approximately 0.2 liters per minute for a 24-hour period. The analysis for sulfur dioxide is a spectrophotometric method. A copy of the sampling and analytical procedures is included in the Appendix of this report.

Figure 2 is a schematic diagram of the sulfur dioxide sampling train used to collect the ambient samples. The components consist of a

TABLE 1

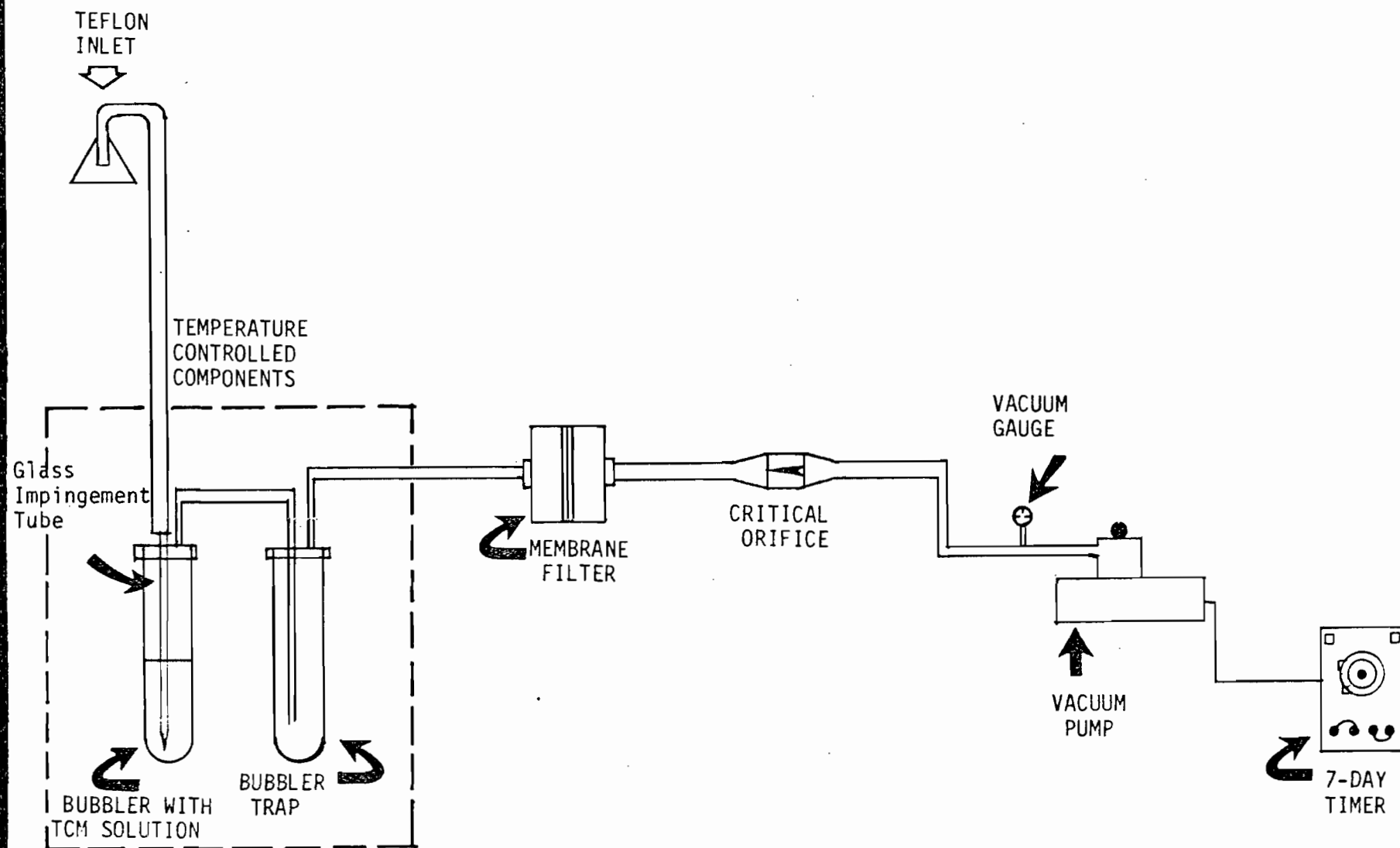
SUMMARY OF 24-HOUR SULFUR DIOXIDE
MONITORING DATA - W.R. GRACE NETWORK
POLK COUNTY, FLORIDA
JANUARY 1977 - JANUARY 1978

Site	No. of Samples	Sulfur Dioxide Data ($\mu\text{g}/\text{m}^3$)			
		24-Hour Concentrations			Annual Average
		High	2nd High	3rd High	
1	60	21.0	9.9	9.5	3.6
2	60	214.8	92.0	17.9	9.2
3	60	15.6	15.1	11.0	3.7
4	59	14.3	9.8	9.4	2.7

FIGURE 2

AMBIENT SO_2 SAMPLING TRAIN

24-HOUR SAMPLING METHOD



teflon inlet tube connected to a polypropylene bubbler containing 50 mililiters of TCM solution. This is connected to a polypropylene trap, then to a membrane filter to clean the stream, and then to a critical orifice and a vacuum pump. The system is controlled with a 7-day timer.

The absorber solution is kept in a refrigerated container prior to, during, and after exposure to prevent sample and reagent deterioration. During the sampling period and during the subsequent storage prior to shipping the samples are maintained at 45-50°F. During shipping the samples are maintained at 50°F. Sampler and storage temperature is monitored by the field technicians and sample temperature is checked upon receipt at the laboratory.

III. SAMPLING SITE DESCRIPTIONS

Sampling Station No. 1 is located at UTM coordinates 3086.5 kilometers north and 407.5 kilometers east. This site is located on reclaimed land owned by W.R. Grace and Company. The station was located at a power sub-station which was the only obstruction within 1000 meters of the sampler. The site is approximately one mile north of Route 60 and slightly to the northwest of the W.R. Grace chemical complex. Between the site and the chemical complex is nothing but reclaimed land.

Station 2 is located at UTM coordinates 3084.7 kilometers north and 404.5 kilometers east. It is located in a residential area of south-

east Mulberry. This station is located in the back yard of a small housing development. To the north and east of the sampler there are no obstructions for approximately 100 meters. To the west and south there are residential homes which are no closer than 30 meters.

Station 3 is located at UTM coordinates 3084.0 kilometers north and 408.8 kilometers east. This sampler had no major obstructions within 500 meters. The sampler is located southwest of the W.R. Grace complex. There are no obstructions between W.R. Grace and the sampler.

Station 4 is located at UTM coordinates 3079.6 kilometers north and 407.2 kilometers east. This sampling site is located in a pasture almost due south of the W.R. Grace chemical complex. The sampler was located approximately 40 meters from a small mobile home with no other obstructions within 200 meters of the sampler. This sampler is located approximately one-half mile off Highway 640.

The SAROAD numbers for each of the sampling sites are:

Station No. 1	103680005
Station No. 2	103680006
Station No. 3	103680007
Station No. 4	103680008.

IV. DISCUSSION OF RESULTS

During the period January 19, 1977 - January 8, 1978 a total of 239 sulfur dioxide samples were collected in the vicinity of the W.R. Grace and Company phosphate fertilized complex and mining operations in Polk County.

Of the 239 sulfur dioxide samples collected, only two, or 0.8 percent, exceeded the 25 microgram per cubic meter minimum detectable level established for the monitoring method by EPA. The sampling and analytical procedures for the method will detect concentrations less than the minimum detectable but the absorption efficiency of sulfur dioxide is low and variable so that these values of less than 25 micrograms per cubic meter are not quantitative.

It can be concluded that the air quality measured by the W.R. Grace network is much better than that required to meet State and Federal air quality standards. The annual average SO_2 levels ranged from 3 to 9 micrograms per cubic meter, compared with the FDER standard of 60 micrograms per cubic meter.

Except for the two excursions measured at Site 2 (215 and 92 micrograms per cubic meter), the 24-hour SO_2 levels were less than one-tenth of the FDER standard of 260 micrograms per cubic meter.

APPENDIX A
SO₂ MONITORING DATA

W.R. GRACE AND COMPANY
AMBIENT SULFUR DIOXIDE MONITORING NETWORK
BARTOW, FLORIDA

24-Hour SO₂ Concentrations
($\mu\text{g}/\text{m}^3$)

Date	Station 1	Station 2	Station 3	Station 4
1/19/77	4.2	1.9	7.2	2.5
1/25/77	4.7	6.2	4.7	4.0
1/31/77	3.6	7.3	2.6	6.5
2/6/77	8.5	8.9	10.1	6.6
2/12/77	9.3	9.5	9.3	9.0
2/18/77	9.5	11.5	9.0	9.4
2/24/77	8.3	7.4	7.1	6.5
3/2/77	0.72	17.9	15.1	14.3
3/8/77	9.9	5.7	8.6	0.39
3/14/77	6.7	13.8	10.0	4.3
3/20/77	2.7	3.5	3.9	2.4
3/26/77	4.0	2.9	3.4	3.7
4/1/77	0.0	0.77	0.0	0.0
4/7/77	0.0	0.0	0.0	0.0
4/13/77	0.96	0.0	0.0	0.0
4/19/77	4.2	92.0	3.4	3.1
4/25/77	2.6	2.7	1.0	3.6
5/1/77	2.5	6.2	2.7	5.0
5/7/77	4.1	4.4	1.2	1.8
5/13/77	1.3	1.8	0.0	1.2
5/19/77	1.2	1.3	1.9	1.7

W.R. GRACE AND COMPANY
 AMBIENT SULFUR DIOXIDE MONITORING NETWORK
 BARTOW, FLORIDA

24-Hour SO₂ Concentrations
 (μg/m³)

Date	Station 1	Station 2	Station 3	Station 4
5/25/77	1.0	3.5	0.3	0.0
5/31/77	0.3	0.3	0.0	0.6
6/6/77	1.0	1.4	0.3	0.6
6/12/77	3.3	7.1	6.0	4.2 ✓
6/18/77	1.0	3.4	5.0	1.8
6/24/77	0.0	15.3	15.6	6.6
6/30/77	2.5	10.5	11.0	0.0
7/6/77	3.8	8.5	9.3	0.0
7/12/77	21.0	13.4	10.9 ✓	3.9 ✓
7/18/77	6.2	9.0	3.0 ✓	5.2 ✓
7/24/77	5.1	4.4	4.4 ✓	6.7 ✓
7/30/77	2.8	7.9	5.7 ✓	7.1 ✓
8/5/77	2.1	2.2	4.4 ✓	9.8 ✓
8/11/77	7.2	9.4	6.6 ✓	---
8/17/77	1.8	3.0	5.6 ✓	0.4 ✓
8/23/77	0.03	0.8	0.6 ✓	0.5 ✓
8/29/77	3.3	214.8	1.6	1.0
9/4/77	2.4	0.8	0.4	0.0
9/10/77	3.9	5.5	1.6	0.0
9/16/77	1.1	2.5	4.5	4.1
9/22/77	4.3	7.8	6.2	5.5
9/28/77	1.2	2.8	5.1	7.3

W.R. GRACE AND COMPANY
 AMBIENT SULFUR DIOXIDE MONITORING NETWORK
 BARTOW, FLORIDA

24-Hour SO₂ Concentrations
 (µg/m³)

Date	Station 1	Station 2	Station 3	Station 4
10/4/77	1.4	2.0	0.6	0.0
10/10/77	4.6	0.7	1.4	1.2
10/16/77	0.7	0.3	0.3	0.3✓
10/22/77	0.7	0.7	0.3	0.7✓
10/28/77	0.0	0.4	0.0	0.0
11/3/77	2.1	0.0	0.0	0.7✓
11/9/77	0.4	0.7	0.3	0.0
11/15/77	0.7	0.7	0.0	0.0
11/21/77	0.0	0.7	0.0	0.0
11/27/77	0.7	0.4	0.4	1.1✓
12/3/77	0.0	0.0	0.0	0.0
12/9/77	0.0	0.0	0.0	0.0✓
12/15/77	0.0	0.0	0.0	0.0✓
12/21/77	0.70	0.0	0.0	0.0
12/27/77	2.1	2.8	3.4	2.8✓
1/2/78	2.2	2.2	2.6	2.9✓
1/8/78	2.1	2.6	2.4	2.5✓
Arithmetic Mean	3.6	9.2	3.7	2.7✓
No. of Samples	60	60	60	59

APPENDIX B
FIELD AND ANALYTICAL PROCEDURES

$$C = \frac{P \times 10^3}{R_d + R_i}$$

Where:

C = Concentration of SO_2 , $\mu\text{g./m.}^3$ at reference conditions.

P = Tube permeation rate, $\mu\text{g./minute}$.

R_d = Flow rate of dilution air, liter/minute at reference conditions.

R_i = Flow rate of inert gas, liter/minute at reference conditions.

8.2.2.3 Sampling and Preparation of Calibration Curve. Prepare a series (usually six) of standard atmospheres containing SO_2 levels from 25 to 390 $\mu\text{g./m.}^3$. Sample each atmosphere using similar apparatus and taking exactly the same air volume as will be done in atmospheric sampling. Determine absorbances as directed in 7.2. Plot the concentration of SO_2 in $\mu\text{g./m.}^3$ (x-axis) against $A - A_0$ values (y-axis), draw the straight line of best fit and determine the slope. Alternatively, regression analysis by the method of least squares may be used to calculate the slope. Calculate the reciprocal of the slope and denote as B_s .

8.3 Sampling Efficiency. Collection efficiency is above 98 percent; efficiency may fall off, however, at concentrations below 25 $\mu\text{g./m.}^3$. (12, 13)

9. Calculations.

9.1 Conversion of Volume. Convert the volume of air sampled to the volume at reference conditions of 25° C. and 760 mm. Hg. (On 24-hour samples, this may not be possible.)

$$V_s = V \times \frac{P}{760} \times \frac{298}{t + 273}$$

V_s = Volume of air at 25° C. and 760 mm Hg, liters.

V = Volume of air sampled, liters.

P = Barometric pressure, mm. Hg.

t = Temperature of air sample, °C.

9.2 Sulfur Dioxide Concentration.

9.2.1 When sulfite solutions are used to prepare calibration curves, compute the concentration of sulfur dioxide in the sample:

$$\mu\text{g. SO}_2/\text{m.}^3 = \frac{(A - A_0) (10^3) (B_s)}{V_s} \times D$$

A = Sample absorbance.

A_0 = Reagent blank absorbance.

10^3 = Conversion of liters to cubic meters.

V_s = The sample corrected to 25° C. and 760 mm. Hg, liters.

B_s = Calibration factor, $\mu\text{g./absorbance unit}$.

D = Dilution factor.

For 30-minute and 1-hour samples,

$D = 1$.

For 24-hour samples, $D = 10$.

9.2.2 When SO_2 gas standard atmospheres are used to prepare calibration curves, com-

pute the sulfur dioxide in the sample by the following formula:

$$\text{SO}_2, \mu\text{g./m.}^3 = (A - A_0) \times B_s$$

A = Sample absorbance.

A_0 = Reagent blank absorbance.

B_s = (See 8.2.2.3).

9.2.3 Conversion of $\mu\text{g./m.}^3$ to p.p.m. If desired, the concentration of sulfur dioxide may be calculated as p.p.m. SO_2 at reference conditions as follows:

$$\text{p.p.m. SO}_2 = \mu\text{g./m.}^3 \times 3.82 \times 10^{-4}$$

10. References.

- (1) West, P. W., and Gaeke, G. O., "Fixation of Sulfur Dioxide as Sulfotomercurate III and Subsequent Colorimetric Determination", *Anal. Chem.* 28, 1816 (1956).
- (2) Sphraims, F., "Inorganic Chemistry," p. 562, Edited by P.O.L. Thorne and E. R. Roberts, 6th Edition, Interscience. (1948).
- (3) Lyles, G. R., Dowling, F. B., and Blanchard, V. J., "Quantitative Determination of Formaldehyde in Parts Per Hundred Million Concentration Level", *J. Air Poll. Cont. Assoc.* 15, 106 (1965).
- (4) Scaringelli, F. P., Saltzman, B. E., and Frey, S. A., "Spectrophotometric Determination of Atmospheric Sulfur Dioxide", *Anal. Chem.* 39, 1709 (1967).
- (5) Pate, J. B., Ammons, B. E., Swanson, G. A., Lodge, J. P., Jr., "Nitrite Interference in Spectrophotometric Determination of Atmospheric Sulfur Dioxide", *Anal. Chem.* 37, 942 (1965).
- (6) Zurlo, N. and Griffini, A. M., "Measurement of the SO_2 Content of Air in the Presence of Oxides of Nitrogen and Heavy Metals", *Med. Lavoro*, 53, 330 (1952).
- (7) Scaringelli, F. P., Elfers, L., Norris, D., and Hochheiser, S., "Enhanced Stability of Sulfur Dioxide in Solution", *Anal. Chem.* 42, 1818 (1970).
- (8) Lodge, J. P. Jr., Pate, J. B., Ammons, B. E. and Swanson, G. A., "Use of Hypodermic Needles as Critical Orifices in Air Sampling," *J. Air Poll. Cont. Assoc.* 16, 197 (1966).
- (9) O'Keeffe, A. E., and Ortman, G. C., "Primary Standards for Trace Gas Analysis", *Anal. Chem.* 38, 760 (1966).
- (10) Scaringelli, F. P., Frey, S. A., and Saltzman, B. E., "Evaluation of Teflon Permeation Tubes for Use with Sulfur Dioxide", *Amer. Ind. Hygiene Assoc. J.* 28, 260 (1967).
- (11) Scaringelli, F. P., O'Keeffe, A. E., Rosenberg, E., and Bell, J. P., "Preparation of Known Concentrations of Gases and Vapors with Permeation Devices Calibrated Gravimetrically", *Anal. Chem.* 42, 871 (1970).

7.2.1.1 30-Minute and 1-Hour Samples. Transfer the sample quantitatively to a 25-ml. volumetric flask; use about 5 ml. distilled water for rinsing. Delay analyses for 20 minutes to allow any ozone to decompose.

7.2.1.2 24-Hour Sample. Dilute the entire sample to 50 ml. with absorbing solution. Pipet 5 ml. of the sample into a 25-ml. volumetric flask for chemical analyses. Bring volume to 10 ml. with absorbing reagent. Delay analyses for 20 minutes to allow any ozone to decompose.

7.2.1 Determination. For each set of determinations prepare a reagent blank by adding 10 ml. unexposed TCM solution to a 25-ml. volumetric flask. Prepare a control solution by adding 2 ml. of working sulfite-TCM solution and 8 ml. TCM solution to a 25-ml. volumetric flask. To each flask containing either sample, control solution, or reagent blank, add 1 ml. 0.8 percent sulfamic acid and allow to react 10 minutes to destroy the nitrite from oxides of nitrogen. Accurately pipet in 2 ml. 0.2 percent formaldehyde solution, then 5 ml. paracresaniline solution. Start a laboratory timer that has been set for 30 minutes. Bring all flasks to volume with freshly boiled and cooled distilled water and mix thoroughly. After 30 minutes and before 60 minutes, determine the absorbances of the sample (denote as A), reagent blank (denote as A_r) and the control solution at 548 nm. using 1-cm. optical path length cells. Use distilled water, not the reagent blank, as the reference. (Note: This is important because of the color sensitivity of the reagent blank to temperature changes which can be induced in the cell compartment of a spectrophotometer.) Do not allow the colored solution to stand in the absorbance cells, because a film of dye may be deposited. Clean cells with alcohol after use. If the temperature of the determinations does not differ by more than 2° C. from the calibration temperature (8.2), the reagent blank should be within 0.03 absorbance unit of the y-intercept of the calibration curve (8.2). If the reagent blank differs by more than 0.03 absorbance unit from that found in the calibration curve, prepare a new curve.

7.2.3 Absorbance Range. If the absorbance of the sample solution ranges between 1.0 and 2.0, the sample can be diluted 1:1 with a portion of the reagent blank and read within a few minutes. Solutions with higher absorbance can be diluted up to sixfold with the reagent blank in order to obtain on-scale readings within 10 percent of the true absorbance value.

8. Calibration and Efficiency.

8.1 Flowmeters and Hypodermic Needle. Calibrate flowmeters and hypodermic needle (8) against a calibrated wet test meter.

8.2 Calibration Curves.

8.2.1 Procedure with Sulfite Solution. Accurately pipet graduated amounts of the working sulfite-TCM solution (8.2.9) (such as 0, 0.5, 1, 2, 3, and 4 ml.) into a series of 25-ml. volumetric flasks. Add sufficient TCM

solution to each flask to bring the volume to approximately 10 ml. Then add the remaining reagents as described in 7.2.2. For maximum precision use a constant-temperature bath. The temperature of calibration must be maintained within $\pm 1^\circ$ C. and in the range of 20° to 30° C. The temperature of calibration and the temperature of analysis must be within 2 degrees. Plot the absorbance against the total concentration in $\mu\text{g. SO}_2$ for the corresponding solution. The total $\mu\text{g. SO}_2$ in solution equals the concentration of the standard (Section 6.2.9) in $\mu\text{g. SO}_2/\text{ml.}$ times the ml. sulfite solution added ($\mu\text{g. SO}_2 = \mu\text{g./ml. SO}_2 \times \text{ml. added}$). A linear relationship should be obtained, and the y-intercept should be within 0.03 absorbance unit of the zero standard absorbance. For maximum precision determine the line of best fit using regression analysis by the method of least squares. Determine the slope of the line of best fit, calculate its reciprocal and denote as B. B is the calibration factor. (See Section 6.2.10.1 for specifications on the slope of the calibration curve). This calibration factor can be used for calculating results provided there are no radical changes in temperature or pH. At least one control sample containing a known concentration of SO_2 for each series of determinations, is recommended to insure the reliability of this factor.

8.2.2 Procedure with SO_2 Permeation Tubes.

8.2.2.1 General Considerations. Atmospheres containing accurately known amounts of sulfur dioxide at levels of interest can be prepared using permeation tubes. In the systems for generating these atmospheres, the permeation tube emits SO_2 gas at a known, low, constant rate, provided the temperature of the tube is held constant ($\pm 0.1^\circ$ C.) and provided the tube has been accurately calibrated at the temperature of use. The SO_2 gas permeating from the tube is carried by a low flow of inert gas to a mixing chamber where it is accurately diluted with SO_2 -free air to the level of interest and the sample taken. These systems are shown schematically in Figures A2 and A3 and have been described in detail by O'Keefe and Ortman (9), Scaringelli, Frey, and Saltzman (10), and Scaringelli, O'Keefe, Rosenberg, and Bell (11).

8.2.2.2 Preparation of Standard Atmospheres. Permeation tubes may be prepared or purchased. Scaringelli, O'Keefe, Rosenberg, and Bell (11) give detailed, explicit directions for permeation tube calibration. Tubes with a certified permeation rate are available from the National Bureau of Standards. Tube permeation rates from 0.2 to 0.4 $\mu\text{g./minute}$, inert gas flows of about 50 ml./minute, and dilution air flow rates from 1.1 to 15 liters/minute conveniently give standard atmospheres containing desired levels of SO_2 (25 to 390 $\mu\text{g./m.}^3$; 0.01 to 0.15 p.p.m. SO_2). The concentration of SO_2 in any standard atmosphere can be calculated as follows:

6.2.7 Sodium Thiosulfate Titrant (0.01 N). Dilute 100 ml. of the stock thiosulfate solution to 1,000 ml. with freshly boiled distilled water.

Normality = Normality of stock solution $\times 0.100$.

6.2.8 Standardized Sulfite Solution for Preparation of Working Sulfite-TCM Solution. Dissolve 0.3 g. sodium metabisulfite ($\text{Na}_2\text{S}_2\text{O}_5$) or 0.40 g. sodium sulfite (Na_2SO_3) in 500 ml. of recently boiled, cooled, distilled water. (Sulfite solution is unstable; it is therefore important to use water of the highest purity to minimize this instability.) This solution contains the equivalent of 320 to 400 $\mu\text{g./ml.}$ of SO_2 . The actual concentration of the solution is determined by adding excess iodine and back-titrating with standard sodium thiosulfate solution. To back-titrate, pipet 50 ml. of the 0.01 N iodine into each of two 500-ml. iodine flasks (A and B). To flask A (blank) add 25 ml. distilled water, and to flask B (sample) pipet 25 ml. sulfite solution. Stopper the flasks and allow to react for 5 minutes. Prepare the working sulfite-TCM solution (6.2.9) at the same time iodine solution is added to the flasks. By means of a buret containing standardized 0.01 N thiosulfate, titrate each flask in turn to a pale yellow. Then add 5 ml. starch solution and continue the titration until the blue color disappears.

6.2.9 Working Sulfite-TCM Solution. Pipet accurately 2 ml. of the standard solution into a 100 ml. volumetric flask and bring to mark with 0.04 M TCM. Calculate the concentration of sulfur dioxide in the working solution:

$$\mu\text{g SO}_2/\text{ml.} = \frac{(A - B) (N) (32,000)}{25} \times 0.02$$

A = Volume thiosulfate for blank, ml.

B = Volume thiosulfate for sample, ml.

N = Normality of thiosulfate titrant.

32,000 = Milliequivalent wt. of SO_2 , $\mu\text{g.}$

25 = Volume standard sulfite solution, ml.

0.02 = Dilution factor.

This solution is stable for 80 days if kept at 5° C. (refrigerator). If not kept at 5° C., prepare daily.

6.2.10 Purified Pararosaniline Stock Solution (0.2 percent nominal).

6.2.10.1 Dye Specifications. The pararosaniline dye must meet the following performance specifications: (1) the dye must have a wavelength of maximum absorbance at 540 nm. when assayed in a buffered solution of 0.1 M sodium acetate-acetic acid; (2) the absorbance of the reagent blank, which is temperature-sensitive (0.015 absorbance unit/°C), should not exceed 0.170 absorbance unit at 22° C. with a 1-cm. optical path length, when the blank is prepared according to the prescribed analytical procedure and to the specified concentration of the dye; (3) the calibration curve (Section 8.2.1) should have a slope of 0.030 ± 0.002 absorb-

ance units/ $\mu\text{g. SO}_2$ at this path length when the dye is pure and the sulfite solution is properly standardized.

6.2.10.2 Preparation of Stock Solution. A specially purified (99–100 percent pure) solution of pararosaniline, which meets the above specifications, is commercially available in the required 0.20 percent concentration (Harleco*). Alternatively, the dye may be purified, a stock solution prepared and then assayed according to the procedure of Scaringelli, et al. (4).

6.2.11 Pararosaniline Reagent. To a 250-ml. volumetric flask, add 20 ml. stock pararosaniline solution. Add an additional 0.2 ml. stock solution for each percent the stock assays below 100 percent. Then add 25 ml. 3 M phosphoric acid and dilute to volume with distilled water. This reagent is stable for at least 9 months.

7. Procedure.

7.1 Sampling. Procedures are described for short-term (30 minutes and 1 hour) and for long-term (24 hours) sampling. One can select different combinations of sampling rate and time to meet special needs. Sample volumes should be adjusted, so that linearity is maintained between absorbance and concentration over the dynamic range.

7.1.1 30-Minute and 1-Hour Samplings. Insert a midjet impinger into the sampling system, Figure A1. Add 10 ml. TCM solution to the impinger. Collect sample at 1 liter/minute for 30 minutes, or at 0.5 liter/minute for 1 hour, using either a rotameter, as shown in Figure A1, or a critical orifice, as shown in Figure A1a, to control flow. Shield the absorbing reagent from direct sunlight during and after sampling by covering the impinger with aluminum foil, to prevent deterioration. Determine the volume of air sampled by multiplying the flow rate by the time in minutes and record the atmospheric pressure and temperature. Remove and stopper the impinger. If the sample must be stored for more than a day before analysis, keep it at 5° C. in a refrigerator (see 4.2).

7.1.2 24-Hour Sampling. Place 50 ml. TCM solution in a large absorber and collect the sample at 0.2 liter/minute for 24 hours from midnight to midnight. Make sure no entrainment of solution results with the impinger. During collection and storage protect from direct sunlight. Determine the total air volume by multiplying the air flow rate by the time in minutes. The correction of 24-hour measurements for temperature and pressure is extremely difficult and is not ordinarily done. However, the accuracy of the measurement will be improved if meaningful corrections can be applied. If storage is necessary, refrigerate at 5° C. (see 4.2).

7.2 Analysis.

7.2.1 Sample Preparation. After collection, if a precipitate is observed in the sample, remove it by centrifugation.

*Hartmen-Leddon, 60th and Woodland Avenue, Philadelphia, PA 19143.

4.2 After sample collection the solutions are relatively stable. At 22° C. losses of sulfur dioxide occur at the rate of 1 percent per day. When samples are stored at 5° C. for 30 days, no detectable losses of sulfur dioxide occur. The presence of EDTA enhances the stability of SO₂ in solution, and the rate of decay is independent of the concentration of SO₂. (7)

5. Apparatus.

5.1 Sampling.

5.1.1 *Absorber.* Absorbers normally used in air pollution sampling are acceptable for concentrations above 25 µg./m.³ (0.01 p.p.m.). An all-glass midjet impinger, as shown in Figure A1, is recommended for 30-minute and 1-hour samples.

For 24-hour sampling, assemble an absorber from the following parts:

Polypropylene 2-port tube closures, special manufacture (available from Bel-Art Products, Pequannock, N.J.).

Glass impingers, 6 mm. tubing, 6 inches long, one end drawn to small diameter such that No. 78 jewelers drill will pass through, but No. 78 jewelers drill will not. (Other end fire polished.)

Polypropylene tubes, 164 by 32 mm. (Nalgene or equal).

5.1.2 *Pump.* Capable of maintaining an air pressure differential greater than 0.7 atmosphere at the desired flow rate.

5.1.3 *Air Flowmeter or Critical Orifice.* A calibrated rotameter or critical orifice capable of measuring air flow within ±2 percent. For 30-minute sampling, a 22-gauge hypodermic needle 1 inch long may be used as a critical orifice to give a flow of about 1 liter/minute. For 1-hour sampling, a 23-gauge hypodermic needle five-eighths of an inch long may be used as a critical orifice to give a flow of about 0.5 liter/minute. For 24-hour sampling, a 27-gauge hypodermic needle three-eighths of an inch long may be used to give a flow of about 0.2 liter/minute. Use a membrane filter to protect the needle (Figure A1a).

5.2 Analysis.

5.2.1 *Spectrophotometer.* Suitable for measurement of absorbance at 548 nm. with an effective spectral band width of less than 15 nm. Reagent blank problems may occur with spectrophotometers having greater spectral band width. The wavelength calibration of the instrument should be verified. If transmittance is measured, this can be converted to absorbance:

$$A = \log_{10}(1/T)$$

6. Reagents.

6.1 Sampling

6.1.1 *Distilled water.* Must be free from oxidants.

6.1.2 *Absorbing Reagent [0.04 M Potassium Tetrachloromercurate (TCM)].* Dissolve 10.86 g. mercuric chloride, 0.064 g. EDTA (ethylenediaminetetraacetic acid, disodium salt), and 6.0 g. potassium chloride in water and bring to mark in a 1,000-ml. volumetric flask. (Caution: highly poisonous. If spilled on skin, flush off with water immediately). The pH of this reagent should be approximately 4.0, but it has been shown that there is no appreciable difference in collection efficiency over the range of pH 5 to pH 3. (7) The absorbing reagent is normally stable for 6 months. If a precipitate forms, discard the reagent.

6.2 Analysis.

6.2.1 *Sulfamic Acid (0.6 percent).* Dissolve 0.6 g. sulfamic acid in 100 ml. distilled water. Prepare fresh daily.

6.2.2 *Formaldehyde (0.2 percent).* Dilute 5 ml. formaldehyde solution (36-38 percent) to 1,000 ml. with distilled water. Prepare daily.

6.2.3 *Stock Iodine Solution (0.1 N).* Place 12.7 g. iodine in a 250-ml. beaker; add 40 g. potassium iodide and 25 ml. water. Stir until all is dissolved, then dilute to 1,000 ml. with distilled water.

6.2.4 *Iodine Solution (0.01 N).* Prepare approximately 0.01 N iodine solution by diluting 50 ml. of stock solution to 500 ml. with distilled water.

6.2.5 *Starch Indicator Solution.* Triturate 0.4 g. soluble starch and 0.002 g. mercuric iodide (preservative) with a little water, and add the paste slowly to 200 ml. boiling water. Continue boiling until the solution is clear; cool, and transfer to a glass-stoppered bottle.

6.2.6 *Stock Sodium Thiosulfate Solution (0.1 N).* Prepare a stock solution by dissolving 25 g. sodium thiosulfate (Na₂S₂O₃·5H₂O) in 1,000 ml. freshly boiled, cooled, distilled water and add 0.1 g. sodium carbonate to the solution. Allow the solution to stand 1 day before standardizing. To standardize, accurately weigh, to the nearest 0.1 mg., 1.5 g. primary standard potassium iodate dried at 180° C. and dilute to volume in a 500-ml. volumetric flask. To a 500-ml. iodine flask, pipet 50 ml. of iodate solution. Add 2 g. potassium iodide and 10 ml. of 1 N hydrochloric acid. Stopper the flask. After 5 minutes, titrate with stock thiosulfate solution to a pale yellow. Add 5 ml. starch indicator solution and continue the titration until the blue color disappears. Calculate the normality of the stock solution:

$$N = \frac{W}{M} \times 2.80$$

N=Normality of stock thiosulfate solution.

M=Volume of thiosulfate required, ml.

W=Weight of potassium iodate, grams.

$$2.80 = \frac{10^4 (\text{conversion of g. to mg.}) \times 0.1 (\text{fraction iodate used})}{36.67 (\text{equivalent weight of potassium iodate})}$$

APPENDIX A—REFERENCE METHOD FOR THE
DETERMINATION OF SULFUR DIOXIDE IN THE
ATMOSPHERE (PARAROSANILINE METHOD)

1. *Principle and Applicability.* 1.1 Sulfur dioxide is absorbed from air in a solution of potassium tetrachloromercurate (TCM). A dichlorosulfite-mercurate complex, which resists oxidation by the oxygen in the air, is formed (1, 2). Once formed, this complex is stable to strong oxidants (e.g., ozone, oxides of nitrogen). The complex is reacted with pararosaniline and formaldehyde to form intensely colored pararosaniline methyl sulfonic acid (3). The absorbance of the solution is measured spectrophotometrically.

1.2 The method is applicable to the measurement of sulfur dioxide in ambient air using sampling periods up to 24 hours.

2. *Range and Sensitivity.* 2.1 Concentrations of sulfur dioxide in the range of 25 to 1,050 $\mu\text{g}/\text{m}^3$ (0.01 to 0.40 p.p.m.) can be measured under the conditions given. One can measure concentrations below 25 $\mu\text{g}/\text{m}^3$ by sampling larger volumes of air, but only if the absorption efficiency of the particular system is first determined. Higher concentrations can be analyzed by using smaller gas samples, a larger collection volume, or a suitable aliquot of the collected sample. Beer's Law is followed through the working range from 0.03 to 1.0 absorbance units (0.8 to 27 μg of sulfite ion in 25 ml. final solution computed as SO_2).

2.2 The lower limit of detection of sulfur dioxide in 10 ml. TCM is 0.75 μg . (based on twice the standard deviation) representing a concentration of 25 $\mu\text{g}/\text{m}^3\text{SO}_2$ (0.01 p.p.m.) in an air sample of 30 liters.

3. *Interferences.* 3.1 The effects of the principal known interferences have been minimized or eliminated. Interferences by oxides of nitrogen are eliminated by sulfamic acid (4, 5), ozone by time-delay (6), and heavy metals by EDTA (ethylenediamine-tetraacetic acid, disodium salt) and phosphoric acid (4, 6). At least 60 μg . Fe (III), 10 μg . Mn(II), and 10 μg . Cr(III) in 10 ml. absorbing reagent can be tolerated in the procedure. No significant interference was found with 10 μg . Cu (II) and 22 μg . V(V).

4. *Precision, Accuracy, and Stability.* 4.1 Relative standard deviation at the 95 percent confidence level is 4.6 percent for the analytical procedure using standard samples. (5)

W. R. GRACE & CO.

AGRICULTURAL CHEMICALS GROUP



August 20, 1976

Mr. Joseph Tessitore
Department of Environmental Regulation
500 East Central Avenue - Suite 238
Winter Haven, Florida 33880

RE: #5 & #6 H₂SO₄ PLANTS

Dear Joe:

After consulting with John Koogler, of Sholtes & Koogler, about our proposed ambient air program, I like to offer the following:

- A. The isopleth map attached to the Construction Permits (Figure #7) is no longer applicable since #1 and #2 plants have been shut down and #4 plant has been brought up to design rate and accepted from the contractor. This means we have moved from Phase III to Phase IV - the operation of #3 and #4 plants only.
- B. Figures #8 and #10 represent the predicted isopleths of our operation during Phase IV and Phase V - after #5 and #6 plants come into operation.

After studying the enclosed maps, John suggested the following plan which is least costly but still gives you the information you want:

- 1. The operation (for 1 year) of the four indicated monitoring locations - three already existing and one new station on Grace property;
- 2. Note that in Phase IV (Figure #8) one station is within the predicted 15 and 20 isopleths and three cover the wider area between the 10 and 15 isopleths;
- 3. Note that in Phase V the new station will also fall between the predicted 15 and 20 isopleths;

Mr. Joseph Tessitore

-2-

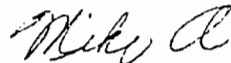
August 20, 1976

4. John Koogler will personally supervise the operation of all four stations on the same schedule as the indicated two D.E.R. stations; this will increase the data available.
5. John will summarize and submit to Grace the data obtained each month; if you would like, John can include the information from the two D.E.R. stations. We will, in turn, forward the report to you.

After you have had a chance to study this proposal, I would like to get together with you and John Koogler to discuss the details. Since #5 and #6 plants are scheduled to be in operation by the first of next year, we should try to resolve this program as soon as possible so we can get as much data as possible before that time.

Sincerely,

W. R. GRACE & CO.
Agricultural Chemicals Group



M. J. Altenburger
Superintendent
Air & Water Quality Control

MJA:db

Enclosure

cc: J. R. Terry (WO/Encl.)
M. P. McArthur (WO/Encl.)
C. Peters (W/Encl.)
John Koogler (W/Encl.) ✓

Best Available Copy

Table 1. Summary of the Proposed Three-Phase Expansion at W. R. Grace
Phosphate Fertilizer Complex Near Bartow, Florida.

Phase	Time Period	Plants in Operation	Operating Capacity (Tons H ₂ SO ₄ /Day)	Emission Rate (Lbs SO ₂ /Ton H ₂ SO ₄)
III	7-1-75	1	700	36
	to	2	700	36
	4-1-76 2-1-76	3	1000	10
IV	8-1-76 4-1-77	3	1000	10
	to	4	1600	4
	7-1-78 2-1-77			
V	7-1-78 2-1-77	3	1000	10
		4	1600	4
		5	1600	4
		6	1600	4

NOTE: Plants 4, 5 and 6 are proposed new plants.

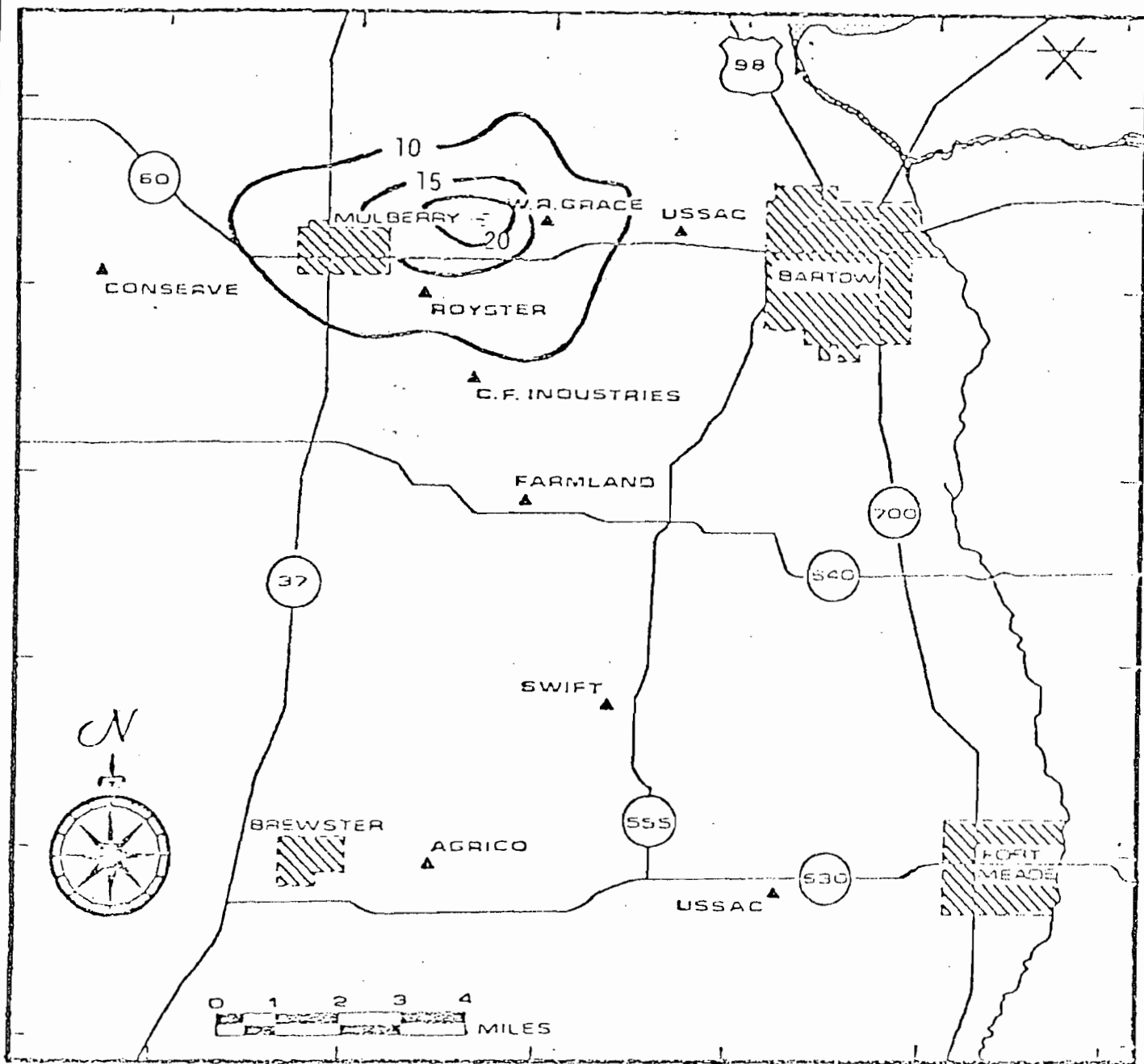


Figure 7. Isopleths of the Contribution to the Annual Average Ground-Level Sulfur Dioxide Concentrations from the W. R. Grace Site Under Emission Conditions Proposed During Phase III of the Grace Expansion Plan ($\mu\text{g}/\text{m}^3$).

#1 - #2 4 #3

- ⊕ NEW STATIONS
- ⊕ EXISTING IND. MON. STATIONS
- D.E.R. STATIONS

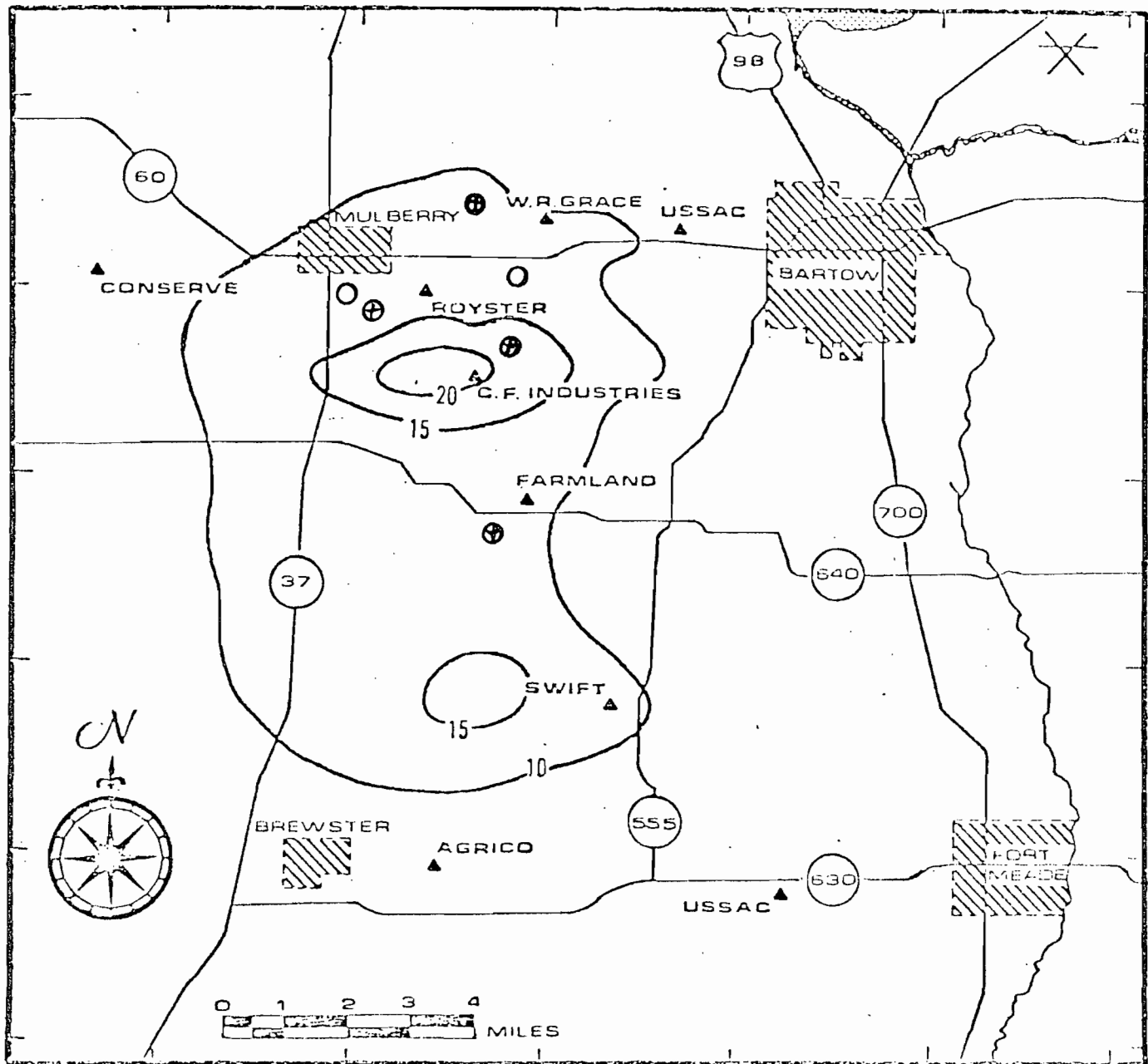


Figure 8. Isopleths of Predicted Annual Average Ground-Level Sulfur Dioxide Concentrations Near the W. R. Grace Plant Site, Polk County, Florida, Under Emission Conditions Proposed During Phase IV of the Grace Expansion Plan. ($\mu\text{g}/\text{m}^3$)

#3 + #4

- ⊕ NEW STATION
- ⊕ EXISTING INDUSTRY STATION
- D.E.R. STATIONS

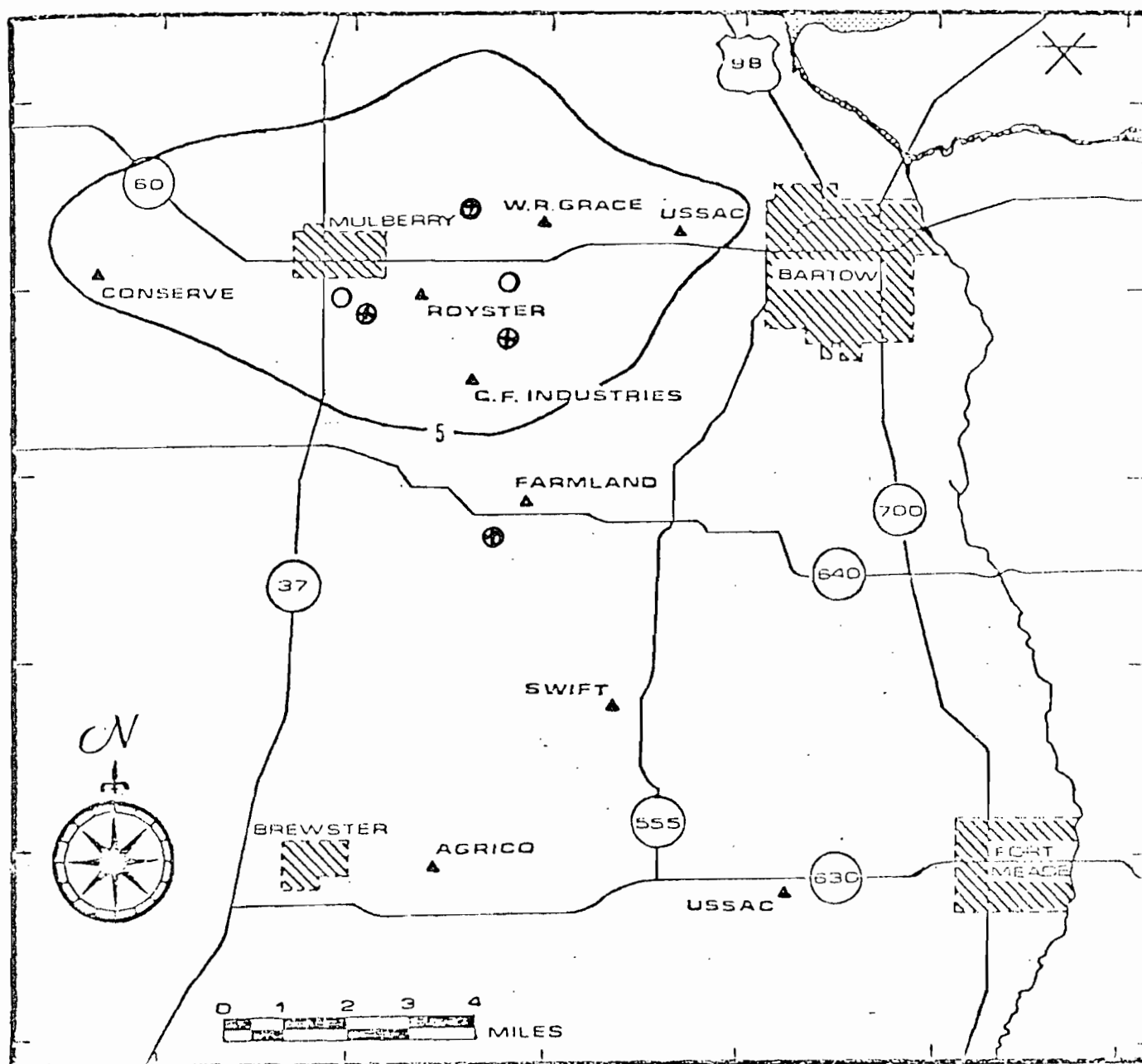


Figure 9. Isopleths of the Contribution to the Annual Average Ground-Level Sulfur Dioxide Concentrations from the W. R. Grace Site, Under Emission Conditions Proposed During Phase IV of the Grace Expansion Plan. ($\mu\text{g}/\text{m}^3$)

#3 & #4

⊕ NEW STATION
 ⊗ EXISTING INDUSTRIAL SITES
 ○ POLL STATIONS

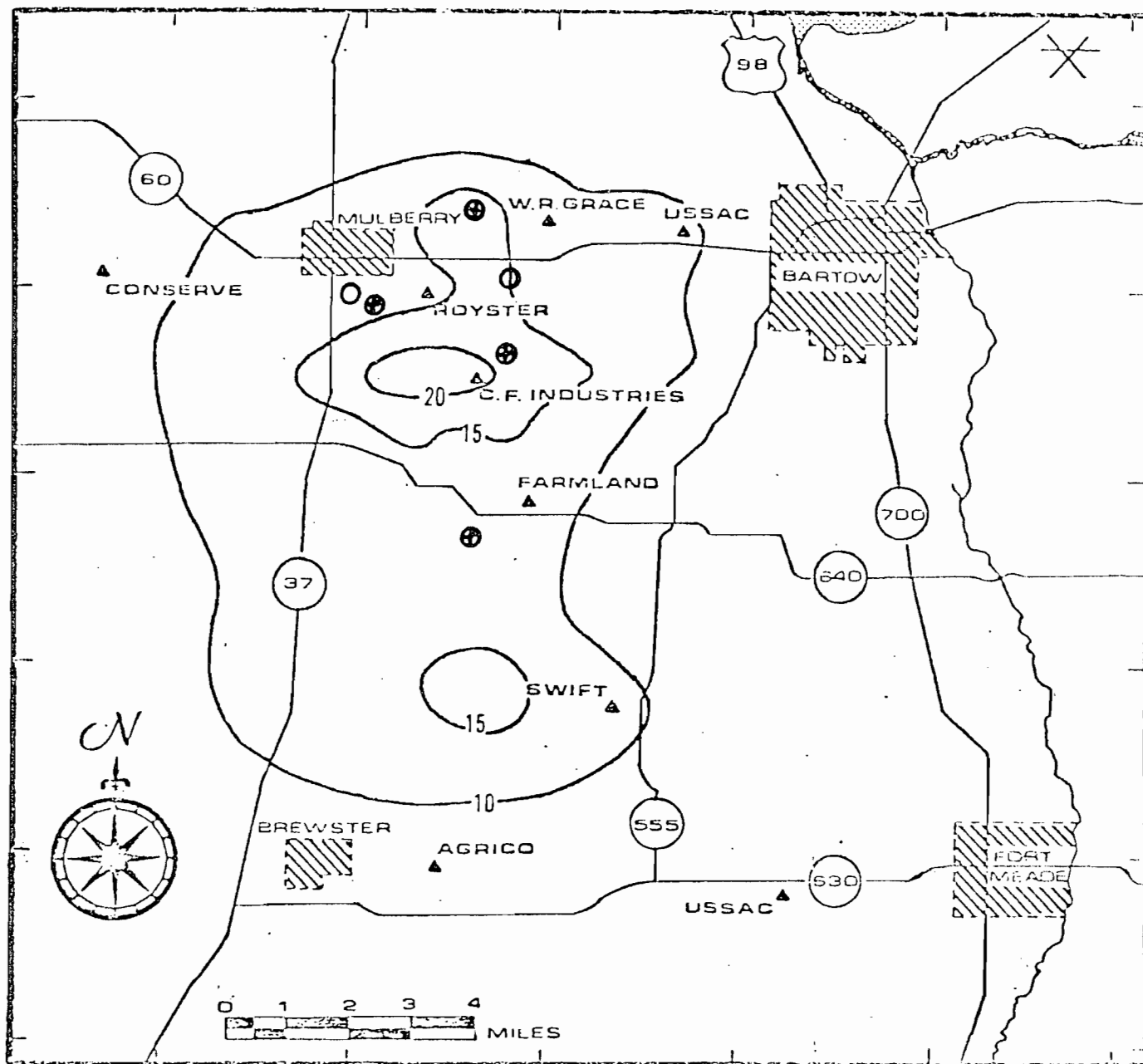


Figure 10. Isopleths of Predicted Annual Average Ground-Level Sulfur Dioxide Concentrations Near the W. R. Grace Plant Site, Polk County, Florida, Under Emission Conditions Proposed During Phase V of the Grace Expansion Plan. ($\mu\text{g}/\text{m}^3$)

#3-#4-#5 & #6

① NEW STATION

② EXISTING INDUSTRIAL SITES

○ D.E.R. STATIONS

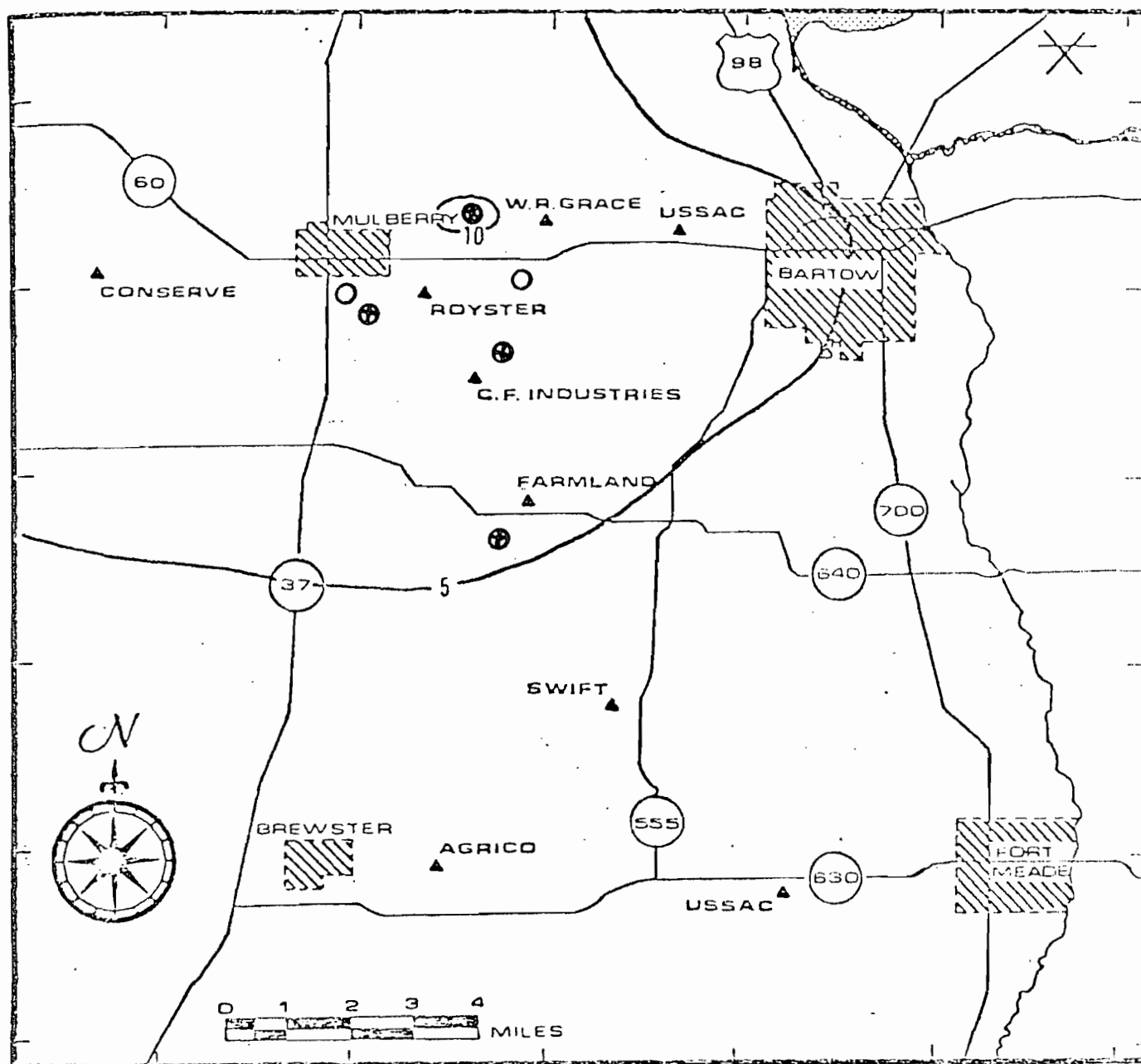


Figure 11. Isopleths of the Contribution to the Annual Average Ground-Level Sulfur Dioxide Concentrations from the W. R. Grace Site Under Emission Conditions Proposed During Phase V of the Grace Expansion Plan. ($\mu\text{g}/\text{m}^3$)

#3 - #4 - #5 + #6

W. R. GRACE & CO.

AGRICULTURAL CHEMICALS GROUP



November 3, 1976

Mr. Joseph Tessitore
Department of Environmental Regulation
500 East Central Avenue - Suite 238
Winter Haven, Florida 33880

RE: AMBIENT AIR MONITORING SO₂ PROGRAM FOR COMPLIANCE WITH
PROVISOS OF CONSTRUCTION PERMITS FOR #5 AND #6 SULFURIC
ACID PLANTS.

Dear Joe:

This letter is to confirm our agreement reached during this morning's meeting with John Koogler in your office.

It was agreed that:

1. W. R. Grace would activate, as soon as possible, the four station network described and located in the letter and enclosures mailed to you August 20, 1976;
2. This network will be under the supervision of Sholtes & Koogler; John Koogler will give you the exact sampling locations, sampling method, analytical methods, etc. to document the entire procedure;
3. This monitoring program will continue for a period of one year in an effort to identify the effects of activating #5 and #6 plants in addition to the existing #3 and #4 plants;
4. This program will be terminated after one year if #5 and #6 plants are demonstrated to be meeting the emission regulations of the Department of Environmental Regulation;

Mr. Joseph Tessitore

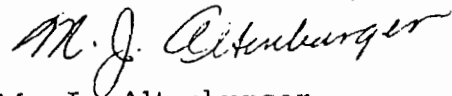
-2-

November 3, 1976

Thank you for your co-operation in this matter.

Sincerely,

W. R. GRACE & CO.
Agricultural Chemicals Group



M. J. Altenburger
Superintendent
Air & Water Quality Control

MJA:db

cc: J. R. Terry
M. P. McArthur
C. F. Peters
John Koogler ✓



SHOLTES & KOOGLER, ENVIRONMENTAL CONSULTANTS
1213 N.W. 6th Street Gainesville, Florida 32601 (904) 377-5822

November 8, 1976

Mr. Joe Tessitore
Florida Department of
Environmental Regulation
Post Office Box 9205
Winter Haven, Florida 33880

Dear Joe:

This letter will confirm the information that Mike Altenburger and I discussed with you during our meeting in your office on November 3, 1976 regarding the W. R. Grace ambient sulfur dioxide monitoring program.

As we discussed, we will place four monitors at the locations shown on the attached map. The UTM coordinates of these stations are:

<u>Station</u>	<u>UTM North (km)</u>	<u>UTM East (km)</u>
1	3086.5	407.5
2	3084.7	404.5
3	3084.0	408.8
4	3079.6	407.2

These sites were selected because they are in locations which will reasonably represent existing air quality and will monitor the impact of W. R. Grace sulfuric acid plants 5 and 6 when these plants are put on-line.

The frequency of sampling at each of the four sites will be once every sixth day using the monitoring schedule adopted by the FDER and EPA. Each of the samplers will run for a 24-hour period from midnight through midnight on the scheduled sampling date.

The monitoring method used at each of these four stations will be the 24-hour reference method for the determination of ambient concentrations of SO₂ as developed by EPA and published in the Federal Register of April 30, 1971. Recommendations published in the document, "The Effect of Temperature on Stability of Sulfur Dioxide Samples Collected by the Federal Reference Method," (EPA report no. EPA-600/4-76-024 by R. G. Fuerst, F. P. Scaringelli and J. H. Margeson, EPA Office of Research and Development, Research Triangle Park, North Carolina, May 1976) will be incorporated into the

Mr. Joe Tessitore

-2-

November 8, 1976

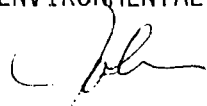
monitoring program to overcome the temperature instability of the monitoring method. The recommendations adopted include the refrigeration of the bubbler sampler and the refrigeration of the exposed samples during storage and shipping prior to analysis.

If you have any questions regarding the sampler locations or the field and analytical procedures, please feel free to contact me.

One matter which we did not discuss, but which deserves some clarification, is the method of reporting the monitoring data. I would appreciate it if you will let me know the frequency of reporting which you desire and whether or not you would like SAROAD numbers assigned to each of the monitoring sites and the data reported on SAROAD forms. I will look for your response on this matter.

Very truly yours,

SHOLTES & KOOGLER
ENVIRONMENTAL CONSULTANTS

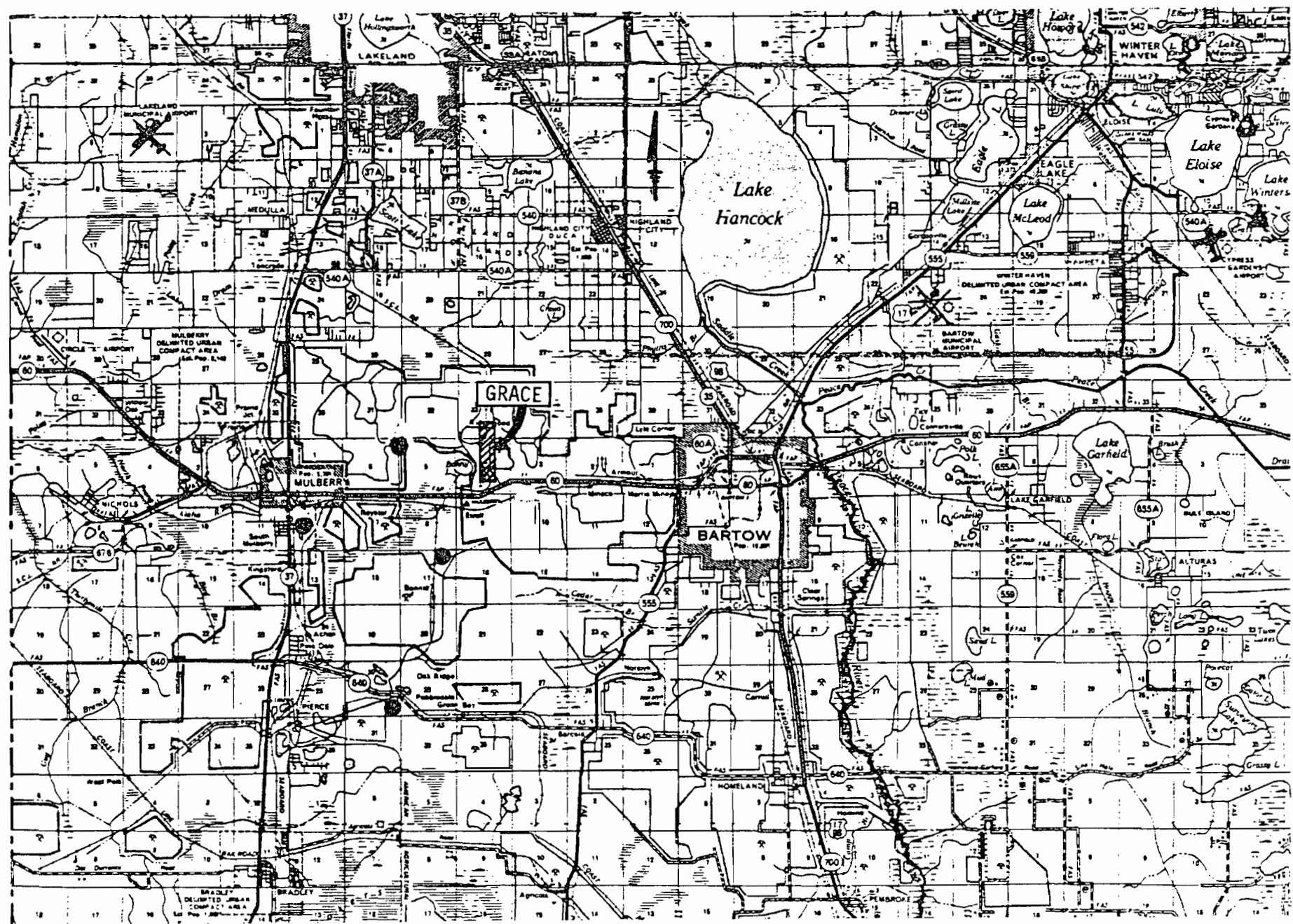


John B. Koogler, Ph.D., P.E.

JBK/jvp

cc: Mike Altenburger

Best Available Copy





REUBIN O.D. ASKEW
GOVERNOR

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

CENTRAL SUBDISTRICT
500 EAST CENTRAL AVENUE
P.O. BOX 9205
WINTER HAVEN, FLORIDA 33880

December 20, 1976

JOSEPH W. LANDERS, JR.
SECRETARY

M. J. Altenburger, Superintendent
Air & Water Quality Control
W. R. Grace & Company
Agricultural Chemicals Group
Post Office Box 471
Bartow, Florida 33830

Re: Ambient Air Monitoring SO₂ Program for Compliance with
Provisions of Construction Permits AC53-2655 & AC53-2656
Sulfuric Acid Plants # 5 & 6

Dear Mr. Altenburger:

The ambient SO₂ monitoring plan for the subject sulfuric acid plants which was submitted on 11-30-76 and further detailed in Sholtes & Koogler letter dated 11-8-76 was reviewed and found acceptable in meeting the provisions for the subject construction permits. Although the construction permit provisos require continuous automatic monitoring of ambient SO₂, the subject program will be acceptable if the temperature instability of SO₂ is eliminated by refrigeration of the bubbler sampler and refrigeration of the samples during storage and shipping prior to analysis.

If you have any questions, do not hesitate to call on me.

Sincerely,

John C. Barnett, P.E.
Branch Office Manager

JCB:JLT:bat

cc: John Koogler ✓

BEST AVAILABLE COPY

203-76-01

Subject: Saroad Site Codes

From: William J. Snider
Air Programs Branch
Region IV Saroad Contact

To: State: *Florida*

The attached Saroad Identification Forms have been updated at NADB. The assigned Saroad code is as indicated in pencil at the top right hand corner (CA 1 A).

If further information is needed, please contact me at 404/526-2864.

Date:

BEST AVAILABLE COPY

TO: SAROAD Contact:
(Air Quality Chief) *FL*

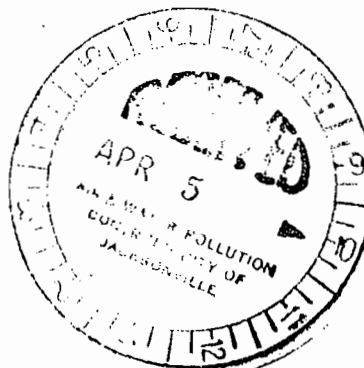
Enclosed you will find the following air quality (SAROAD) report(s):

Report	# copies	period
<input type="checkbox"/> NA 219 (1 hour data)	_____	_____
<input type="checkbox"/> NA 209 (24 hour data)	_____	_____
<input type="checkbox"/> NA 211 (Year Frequency)	_____	_____
<input type="checkbox"/> NA 212 (Year by Quarters)	_____	_____
<input type="checkbox"/> NA 240 (Quarterly Frequency with 2nd max)	_____	_____
<input type="checkbox"/> NA 202S (Inventory by Site)	_____	_____
<input type="checkbox"/> NA 202P (Inventory by Pollutant)	_____	_____
<input type="checkbox"/> NA 217Y (Yearly Frequency - No Site Desc.)	_____	_____
<input type="checkbox"/> NA 217Q (Quarterly Frequency - No Site Desc.)	_____	_____
<input type="checkbox"/> (Particulate Trends - # Violations)	_____	_____
<input type="checkbox"/> (SO ₂ Trends - # Violations)	_____	_____
<input type="checkbox"/> (O _x Trends - # Violations)	_____	_____
<input type="checkbox"/> (NO _x Trends)	_____	_____
<input type="checkbox"/> (CO Trends - # Violations)	_____	_____
<input type="checkbox"/> NA 252 (Active Sites Reporting)	_____	_____
<input type="checkbox"/> SAROAD Editor Parameter File	_____	_____
<input type="checkbox"/> NA 026 (Pre-edit or Receipt)	_____	_____
<input type="checkbox"/> NA 027 (Edit)	_____	_____
<input type="checkbox"/> Duplicate Data Edit	_____	_____
<input type="checkbox"/> Table #1 (Monitoring Sites not Reporting during quarter)	_____	_____
<input type="checkbox"/> SAROAD-PL (Sorted raw data listing prior to edit)	_____	_____

Other:

*SAROAD SITE
CODES*

Comments:



If you have any questions please contact Barry Gilbert or myself at 404/526-2864.

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ENVIRONMENTAL PROTECTION AGENCY

National Aerometric Data Bank

Research Triangle Park, N. C. 27711

SAROAD Site Identification Form

RECEIVED
MAY 1977REVISIONS:
() CHANGE
() ADD
() DELETE

LE 70076

Form Completed By SHOLTES & KOOGLER
JB KOOGLER 904/377-5822 Date 3/15/77 New ☒

TO BE COMPLETED BY THE REPORTING AGENCY

DO NOT WRITE HERE

A FLORIDA SOURCE ORIENTED
State ProjectPOLK COUNTY FL
City Name (23 characters)POLK COUNTY FL
County Name (15 characters)

City Population (right justified)

						0	0	0
52	53	54	55	56	57	58	59	

Longitude
Deg. Min. Sec.

0	0							
62	63	64	65	66	67	68	69	

TM Zone Easting Coord., meters

1	7			4	0	7	5	0	0
62	63	64	65	66	67	68	69		

Latitude
Deg. Min. Sec.

N								
70	71	72	73	74	75	76		

Northing Coord., meters

3	0	8	7	4	0	0		
70	71	72	73	74	75	76		

B SHOLTES & KOOGLER ENV. CONSULTANTS
Supporting Agency (61 characters)1213 NW 6TH ST
Supporting Agency, continuedGAINESVILLE FLC WR GRACE NETWORK STA 1
Optional: Comments that will help identifyBARTOW FL
the sampling site (132 characters)SO2 MONITOR PER 40CFR50; TEMPD CONTROLLED
Abbreviated Site Address (25 characters)1.8 KM NORTH SR 60
Abbreviated Site Address (25 characters)E 1.8 KM NORTH SR 60
Abbreviated Site Address (25 characters)State Area Site
A 1 0 3 6 8 0 0 0 5
1 2 3 4 5 6 7 8 9 10Agency Project
J 0 2
11 12 13Region Action
4 0 7 1
77 80State Area Site
B
1 2 3 4 5 6 7 8 9 10Agency Project SMSA Action
11 12 13 14 15 16 17 80State Area Site
C
1 2 3 4 5 6 7 8 9 10Agency Project Action
11 12 13 80State Area Site
D
1 2 3 4 5 6 7 8 9 10Agency Project Action
11 12 13 80State Area Site
E
1 2 3 4 5 6 7 8 9 10Agency Project Action
11 12 13 80

MB No. 158-R0012

Approval expires 6/30/76

(over)

BEST AVAILABLE COPY

ENVIRONMENTAL PROTECTION AGENCY

National Aerometric Data Bank

Research Triangle Park, N. C. 27711

SAROAD Site Identification Form

LE 70076

Form Completed By SCHULTES & KOOGLER
JB KOOGLER 904/377-5822 Date 3/15/77New ☒

() DELETE

DEVIATIONS:

() CHANGE

() ADD

TO BE COMPLETED BY THE REPORTING AGENCY

DO NOT WRITE HERE

FLORIDA

State

SOURCE ORIENTED

Project

MULBERRY FL

City Name (23 characters)

POLK COUNTY

County Name (15 characters)

City Population (right justified)

				3	1	5	0
52	53	54	55	56	57	58	59

Longitude
Deg. Min. Sec.Latitude
Deg. Min. Sec.

0	W							
61	62	63	64	65	66	67	68	69

N								
70	71	72	73	74	75	76		

TM Zone

Easting Coord., meters

Northing Coord., meters

7			4	0	4	5	0	0
61	62	63	64	65	66	67	68	69

3	0	8	4	7	0	0		
70	71	72	73	74	75	76		

SCHULTES & KOOGLER ENV CONSULTANTS

Supporting Agency (61 characters)

1213 NW 6TH ST

Supporting Agency, continued

GAINESVILLE FL

WR GRACE NETWORK STA 2

Optional: Comments that will help identify

BARTOW FL

the sampling site (132 characters)

SO2 MONITOR PER 40CFR50 ; TEMP

CONTROLLED

KINGSFORD RD MULBERRY FL

Abbreviated Site Address (25 characters)

State Area Site

A	1	0	3	6	8	0	0	0	6
1	2	3	4	5	6	7	8	9	10

Agency

Project

J
11

0	2
12	13

Region

Action

4
77

0	7

1
80

State Area Site

B									
1	2	3	4	5	6	7	8	9	10

Agency Project

SMSA

Action

11

12	13

0	0	0	0
14	15	16	17

1
80

State Area Site

C									
1	2	3	4	5	6	7	8	9	10

Agency Project

Action

11

12	13

80

State Area Site

D									
1	2	3	4	5	6	7	8	9	10

Agency Project

Action

11

12	13

80

State Area Site

E									
1	2	3	4	5	6	7	8	9	10

Agency Project

Action

11

12	13

80

V6 No. 158-R0012

V6 No. 158-R0012 expires 6/30/76

(over)

BEST AVAILABLE COPY ENVIRONMENTAL PROTECTION AGENCY

National Aerometric Data Bank
Research Triangle Park, N. C. 27711

SAROAD Site Identification Form

REVISIONS:

() CHANGE

() ADD

() DELETE

7076

Completed By SHOLTES & KOOGLER JBK DOGLER 904/377-5822 Date 3/15/77

New ☒

TO BE COMPLETED BY THE REPORTING AGENCY

DO NOT WRITE HERE

FLORIDA

State

SOURCE ORIENTED

Project

POLK COUNTY FL

City Name (23 characters)

POLK COUNTY FL

County Name (15 characters)

City Population (right justified)

57 53 54 55 56 57 58 59 000

Longitude

Deg. Min. Sec.

W 62 63 64 65 66 67 68 69

Latitude

Deg. Min. Sec.

N 70 71 72 73 74 75 76

Easting Coord., meters

62 63 64 65 66 67 68 69 408800

Northing Coord., meters

70 71 72 73 74 75 76 3084000

SHOLTES & KOOGLER ENV CONSULTANTS

Supporting Agency (61 characters)

1213 NW 6TH ST

Supporting Agency, continued

GAINESVILLE FL

WR GRACE NETWORK STA 3

Optional: Comments that will help identify

BARTOW FL

the sampling site (132 characters)

SO2 MONITOR PER 40CFR 50; TEMP.

CONTROLLED

BONNIE MINE RD

Abbreviated Site Address (25 characters)

State Area Site
A 1 0 3 6 8 0 0 0 7

Agency

J 11

Project

02 12 13

Region

4 11

Action

1 80

State Area Site
B 1 2 3 4 5 6 7 8 9 10

Agency Project

11 12 13

SMSA

0000 14 15 16 17

Action

1 80

State Area Site
C 1 2 3 4 5 6 7 8 9 10

Agency Project

11 12 13

Action

80

State Area Site
D 1 2 3 4 5 6 7 8 9 10

Agency Project

11 12 13

Action

80

State Area Site
E 1 2 3 4 5 6 7 8 9 10

Agency Project

11 12 13

Action

80

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ENVIRONMENTAL PROTECTION AGENCY

National Aerometric Data Bank

Research Triangle Park, N. C. 27711

REVISIONS:

() CHANGE

() ADD

() DELETE

70076

SAROAD Site Identification Form

Form Completed By SHOLTES & KOOGLER
JR KOOGLER 904/377-3822 Date 3/15/77 New ☒

TO BE COMPLETED BY THE REPORTING AGENCY

DO NOT WRITE HERE

FLORIDA

State

SOURCE ORIENTED

Project

POLK COUNTY FL

City Name (23 characters)

POLK COUNTY FL

County Name (15 characters)

City Population (right justified)

52	53	54	55	56	57	58	59
				0	0	0	

Longitude

Deg. Min. Sec.

Latitude

Deg. Min. Sec.

60	61	62	63	64	65	66	67	68	69
0		W							

70	71	72	73	74	75	76
N						

Zone

Easting Coord., meters

Northing Coord., meters

80	81	82	83	84	85	86	87	88	89
7		4	0	7	2	0	0		

90	91	92	93	94	95	96
3	0	7	9	6	0	0

SHOLTES & KOOGLER ENV CONSULTANTS

Supporting Agency (61 characters)

1213 NW 6TH ST

Supporting Agency, continued

GAINESVILLE FL

WR GRACE NETWORK STA 4

Optional: Comments that will help identify

BARTOW FL

the sampling site (132 characters)

SO2 MONITOR PER 40 CFR 50; TEMP

CONTROLLED

(14-79)

0.2 KM SOUTH SR 640

Abbreviated Site Address (25 characters)

MB No. 158-R0012

Approval expires 6/30/76

(over)

State

Area

Site

1	2	3	4	5	6	7	8	9	10
A	1	0	3	6	8	0	0	0	8

Agency

Project

11
J

12	13
0	2

Region

Action

17
4

07

80
1

State

Area

Site

1	2	3	4	5	6	7	8	9	10
8									

Agency Project

SMSA

Action

11	12	13	14	15	16	17	80
			0	0	0	0	

State

Area

Site

1	2	3	4	5	6	7	8	9	10
C									

Agency

Project

Action

11	12	13	80

State

Area

Site

1	2	3	4	5	6	7	8	9	10
D									

Agency

Project

Action

11	12	13	80

State

Area

Site

1	2	3	4	5	6	7	8	9	10
E									

Agency

Project

Action

11	12	13	80

ENVIRONMENTAL PROTECTION AGENCY

NATIONAL AEROMETRIC DATA BANK

RESEARCH TRIANGLE PARK, N.C. 27711

SAROAD MULTIPLE-STATION DATA FORM.

OMB No 158 R0012
Approval Expires 6/30/71

3		STATE	AGENCY	PROJECT	TIME
1	AGENCY	2 3	4	5 6	7
PARAMETER OBSERVED		TIME INTERVAL		PARAMETER	METHOD
				8 9 10 11 12	13 14
				15 16	17
METHOD		UNITS		PROJECT	
SITE ADDRESS A			SITE ADDRESS B		
SITE ADDRESS C			SITE ADDRESS D		
DAY	START HOUR	AREA	SITE	VALUE	
22 23	(24-25)	(26-32)	A	(33-36)	
	(37-38)	(39-45)	B	(46-49)	
	(50-51)	(52-58)	C	(59-62)	
	(63-64)	(65-71)	D	(72-75)	
SITE ADDRESS E			SITE ADDRESS F		
SITE ADDRESS G			SITE ADDRESS H		
DAY	START HOUR	AREA	SITE	VALUE	
22 23	(24-25)	(26-32)	E	(33-36)	
	(37-38)	(39-45)	F	(46-49)	
	(50-51)	(52-58)	G	(59-62)	
	(63-64)	(65-71)	H	(72-75)	
SITE ADDRESS I			SITE ADDRESS J		
SITE ADDRESS K			SITE ADDRESS L		
DAY	START HOUR	AREA	SITE	VALUE	
22 23	(24-25)	(26-32)	I	(33-36)	
	(37-38)	(39-45)	J	(46-49)	
	(50-51)	(52-58)	K	(59-62)	
	(63-64)	(65-71)	L	(72-75)	



SHOLTES & KOOGLER, ENVIRONMENTAL CONSULTANTS
1213 N.W. 6th Street Gainesville, Florida 32601 (904) 377-5822

August 22, 1977

Mr. Robert Stephens
Florida Department of
Environmental Regulation
500 E. Central Avenue
Suite 238
Winter Haven, FL 33880

Re: W.R. Grace Company--Operating Permits for No. 5 and 6
Sulfuric Acid Plants

Dear Bob:

I would like to confirm the meetings we had on Monday, August 15, 1977 in the Bartow area to review the W.R. Grace monitoring network. The visit included a review of the four monitoring sites and an inspection of the interior of the samplers at stations 2, 3 and 4. The No. 1 sampler was not inspected due to the fact that I did not have a key for this sampler. In addition to inspecting the sites, I outlined the procedures followed by our field technician, Mr. George Vallejo, and I gave you a copy of the checklist George follows each time he services one of the samplers. You also had an opportunity to meet George when he met us at the No. 2 sampling site.

In discussing our program with you following the tour you informed me that you had no objection to the sampling procedures that we employed. You did ask however that in the future we correct calculated sulfur dioxide concentrations to standard temperature, pressure and dry conditions. I confirmed that we would do this and further volunteered that we would go back and calculate a representative number of previously recorded sulfur dioxide data to standard temperature, pressure and dry conditions.

I would also like to report to you that the pump on the No. 4 sampler has been replaced. This is the pump that did not operate during our tour.

Mr. Robert Stephens

August 22, 1977

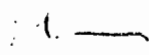
Page Two

I would also like to confirm that during our site visit I transmitted to you ambient sulfur dioxide data collected at the four monitoring sites through July 12, 1977. Included in the material transmitted to you was a tabular summary of all data collected at each of the four sampling sites and SAROAD forms with the ambient data appropriately entered.

I enjoyed our visit and look forward to seeing you again.

Very truly yours,

SHOLTES & KOOGLER
ENVIRONMENTAL CONSULTANTS


John B. Koogler, Ph.D., P.E.

JBK:vw

cc: Mr. Mike Altenburger

Take With You

Old data sheet

New set of orifices and data sheet

TCM

4 shipping tubes with labels

labels to include: W. R. Grace
Site No. (1, 2, 3 or 4)
Sample date

Wash bottle with distilled water

At Each Site

Check refrigerator temperature

Check timer time (make note if time not correct and set to correct time
and date)

Change timer trips to next sample date

Turn on pump and record final vacuum

While pump is running, check bubble rate in sample tube

Turn pump off

Put TCM in shipping tube

Rinse sample tube with distilled water

Put fresh TCM in sample tube

Change orifice

Turn pump on

Record initial vacuum

Check bubble rate

Turn pump off

Check sample line

Keep area around sampler clean

General

Store samples, TCM, and distilled water in refrigerator

Ship samples every third week to Jacksonville

Ship orifices and data sheets every third week to Gainesville

SAMPLING NETWORK W. R. Grace Pollutant SO₂

Date Absorbant Prepared _____ Sampling Date 1/2/78 Sample Start Time 0001

Date Absorbers Placed in Field _____ Sample Pick-up Date _____

Station No.	Orifice No.	Initial Vacuum (in. Hg)	Final Vacuum (in. Hg)	Sample Time (min)	Initial Calibration (L/M)	Final Calibration (L/M)	Average Flow Rate (L/M)
<u>1</u>	<u>S-48</u>	<u>25"</u>	<u>20"</u>	<u>1440</u>	<u>.194</u>	<u>.193</u>	<u>.1935</u>
<u>2</u>	<u>S-49</u>	<u>20"</u>	<u>20"</u>	<u>1440</u>	<u>.194</u>	<u>.191</u>	<u>.1925</u>
<u>3</u>	<u>S-50</u>	<u>20"</u>	<u>20"</u>	<u>1440</u>	<u>.200</u>	<u>.188</u>	<u>.189</u>
<u>4</u>	<u>S-51</u>	<u>20"</u>	<u>20"</u>	<u>1440</u>	<u>.194</u>	<u>.194</u>	<u>.194</u>

Wind Speed (mph) 0 - 3 _____ Relative Humidity (%) _____
 4 - 8 _____ Average Temp. (°F) _____
 > 8 _____ Average Pressure (mmHg) _____

REMARKS: _____

Initial calibration 8 Dec 77

Final Final " 25 Jan 78

Signature F. S. V.

FIELD DATA SHEET
(1/2/78)

Best Available Copy

FinalSAMPLING NETWORK W. R. Grace

Pollutant

SO₂

Date Absorbant Prepared _____

Sampling Date

12/27/77

Sample Start Time

0001

Date Absorbers Placed in Field _____

Sample Pick-up Date _____

Station No.	Orifice No.	Initial Vacuum (in. Hg)	Final Vacuum (in. Hg)	Sample Time (min)	Initial Calibration (L/M)	Final Calibration (L/M)	Average Flow Rate (L/M)
<u>1</u>	<u>S-18</u>	<u>26"</u>	<u>20"</u>	<u>1440</u>	<u>.200</u>	<u>.197</u>	<u>.1985</u>
<u>2</u>	<u>S-44</u>	<u>20"</u>	<u>20"</u>	<u>1440</u>	<u>.202</u>	<u>.202</u>	<u>.202</u>
<u>3</u>	<u>S-45</u>	<u>20"</u>	<u>20"</u>	<u>1440</u>	<u>.204</u>	<u>.206</u>	<u>.205</u>
<u>4</u>	<u>S-46</u>	<u>20"</u>	<u>20"</u>	<u>1440</u>	<u>.203</u>	<u>.202</u>	<u>.2025</u>

Wind Speed (mph) 0 - 3 _____

Relative Humidity (%) _____

4 - 8 _____

Average Temp. (°F) _____

> 8 _____

Average Pressure (mmHg) _____

REMARKS: _____

Initial Calibration 8 Dec - 77 NewmanFinal Calibration 25 Jan - 78

Signature

[Signature]FIELD DATA SHEET
(12/27/77)

BEST AVAILABLE COPY
 AMBIENT SAMPLING DATA SHEET

LAB DATA SHEET
 (12/27/77 & 1/12/78)

Project Name Sholtest-Kearless
 Project No. 77-088-001
 Month/Year 78

Sample Type SO₂
 Sample Duration 24 hours
 Field Sampler SK-EC

SAMPLE NO.	DATE	STN & RUN #s	% T	Total $\mu\text{g/sample}$	FLOW RATE	$\mu\text{g/m}^3$	Comments
250	12-27-77	Wk Grast 1	92.5	0.6		2.1	
251	12-27-77	" 2	91.9	0.8		2.2	
252	12-27-77	" 3	91.4	1.0		3.4	
253	12-27-77	" 4	91.9	0.8		2.8	
254	1-2-78	" 1	92.5	0.6		2.2	
255	1-2-78	" 2	92.5	0.6		2.2	
256	1-2-78	" 3	92.1	0.7		2.6	
257	1-12-78	" 4	92.0	0.8		2.9	
258	1-8-78	" 1	92.4	0.6		2.1	
259	1-8-78	" 2	92.1	0.7		2.6	
260	1-8-78	" 3	92.1	0.7		2.4	
261	1-8-78	" 4	92.1	0.7		2.5	
262	1-14-78	" 2	93.6	0.3			
263	" " "	" 3	93.8	0.2			
264	" " "	" 4	94.0	0.2			
265	" " "	" 5	82.5	11.9			
266	" " "	" 6	84.9	3.1			
267	" " "	" 7	87.0	2.4			
268	" " "	" 8	34.0	29.3			
269	" " "	" 9	88.9	1.8			
270	" " "	" Blank	94.5	0.0			
271	" " "	" 11	93.3	0.4			
272	" " "	" 12	92.6	0.6			
273	1-14-78	" 13	90.5	1.3			
274	1-20-78	" 2	94.3	0.1			
275	"	" 3	61.5	12.4			
276	"	" 4	62.0	12.1			
277	"	" 5	77.4	5.8			
278	"	" 6	58.9	13.6			
279	"	" 7	60.0	13.1			
280	"	" 8	38.6	25.7			
281	"	" 9	66.5	10.1			
282	"	" Blank	94.6	0.0			
283	"	" 11	78.9	5.2			
284	"	" 12	63.8	11.3			
285	1-20-78	" 13	77.0	2.9			

Sample temperature when received at Laboratory

In the folder labeled as follows there are documents, listed below, which were not reproduced in this electronic file. That folder can be found in the supplementary documents file drawer. Folders in that drawer are arranged alphabetically, then by permit number.

Folder Name: Agrico Chemical Company
Permit(s) numbered: AC 53-34861
AC 53-34865
AC 53-34868

S. Pierce Works Bartow, Polk County
AC 53-34871

Documents:
Period During Which
DOCUMENT WAS
SUBMITTED
(APPLICATION, PD & TE,
FINAL DETERMINATION,
POST PERMIT

App 11/3/80

Detailed Description

1. Phos. ACID "A" TRAIN FUME
SCRUBBER WATER AND FUME FLOW
SCHEMATIC (BLUE PRINT)

AIR QUALITY REVIEW
FOR PROPOSED PHOSPHATE FERTILIZER COMPLEX EXPANSION

AGRICO CHEMICAL COMPANY
SOUTH PIERCE CHEMICAL WORKS

AUGUST 29, 1980

SHOLTES & KOOGLER
ENVIRONMENTAL CONSULTANTS
1213 NW 6TH STREET
GAINESVILLE, FLORIDA 32601
(904) 377-5822

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1.0 EXISTING AIR QUALITY DATA

1.1 Existing Data

Pollutants for which monitoring data might be required are sulfur dioxide, particulate matter and nitrogen oxides. Various factors, including air quality modeling and existing monitoring data justify eliminating the necessity for Agrico to enter into a preconstruction ambient air monitoring program.

Particulate matter monitoring data have been collected in Polk County for several years by the Florida Department of Environmental Regulation and other organizations. The data collected by the Department of Environmental Regulation at the Union Hall monitoring site (approximately one kilometer south of SR 60 on Bonnie Mine Road) is probably most representative of air quality in areas of phosphate industry activity.

This monitoring site was located in an area with much greater phosphate industry related activity than the area in which the Agrico South Pierce Chemical Works is located. Data from the Union Hall site for the period January 1978 through October 1979 were analyzed to establish some reference to the impact of phosphate industry activity on ambient total suspended particulate matter levels. Those monitoring data are presented in Table 1-1. The data show a long-term (20-month) geometric mean TSP level of 53.6 micrograms per cubic meter and a second-high 24-hour TSP level of 119 micrograms per cubic meter. The TSP levels near Agrico are expected to be lower than these levels because the density of phosphate fertilizer related activities is lower.

The existing sulfur dioxide monitoring data available for Polk County is submitted under separate cover with this permit package. These data were collected at monitors located 8-16 km north of the Agrico site in an area with a much heavier sulfur dioxide emission burden. Since the monitoring data indicated that there was no threat to sulfur dioxide ambient air quality standards in this area, it followed that there would be even less of a threat to exceeding the standards near the Agrico plant site. The detailed modeling of sulfur dioxide emissions included in Section 2.0 of this application confirms the preliminary modeling data and further supports the preliminary decision that preconstruction sulfur dioxide monitoring is not necessary to determine whether emissions will cause or contribute to a violation of an ambient air quality standard.

Other pollutants potentially emitted from the proposed sources for which ambient air quality standards exist are carbon monoxide and nitrogen oxides. The potential emission rate of both of these pollutants is less than 100 tons per year. Because of this neither preconstruction nor post-construction air quality monitoring is required for these pollutants.

1.2 Background Concentrations

Background levels for particulate matter, sulfur dioxide and nitrogen oxides have been estimated. For nitrogen oxides and sulfur dioxide the background was assumed to be zero. This assumption was made since all of the sulfur dioxide and nitrogen oxides emitted within several miles of

the proposed Agrico chemical complex are emitted from permitted air pollution sources. Emission data for these sources are on file with the Florida Department of Environmental Regulation office in Tampa, Florida and were taken into consideration in developing emission inventories which were used for air quality modeling.

The background concentrations of particulate matter for the annual average period and the 24-hour average period were derived from two reports: A Comparison of Total Suspended Particulate Matter Levels in The Ambient Air Measured at Two Monitoring Sites in Mulberry, Florida, Sholtes & Koogler Environmental Consultants, April 1977; and Environmental Impact Statement-Draft, Estech General Chemicals Corporation, Duette Mine, Manatee County, Florida, US EPA Region IV, October 1979. In the first report an annual average particulate matter background concentration of 35 micrograms per cubic meter is reported. In the second report an annual average background concentration of 25 micrograms per cubic meter is reported. Since the Agrico site is approximately mid-way between the areas included in the two referenced studies, the annual total suspended particulate matter background for the Agrico SPCW area was assumed to be 30 micrograms per cubic meter.

For the 24-hour background, the Estech EIS reports a concentration of 55 micrograms per cubic meter. A 24-hour background level was not reported in the Sholtes & Koogler report. Since the annual average particulate matter background level assumed for the Agrico site was five micrograms per cubic meter higher than that reported in the Estech EIS, a 24-hour background level of 60 micrograms per cubic meter, which is five micrograms per cubic meter higher than the 24-hour background reported in the Estech EIS, was assumed for the Agrico site.

TABLE 1-1
FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION
TOTAL SUSPENDED PARTICULATE MATTER MONITORING DATA

UNION HALL SITE
JANUARY, 1978 TO OCTOBER, 1979

POLK COUNTY, FLORIDA

DATE	TSP ($\mu\text{g}/\text{m}^3$)	DATE	TSP ($\mu\text{g}/\text{m}^3$)	DATE	TSP ($\mu\text{g}/\text{m}^3$)	DATE	TSP ($\mu\text{g}/\text{m}^3$)
1/6/78	58	7/5	50	1/1/79	67	7/6	50
1/12	68	7/11	48	1/7	67	7/12	44
1/18	56	7/17	46	1/13	63	7/18	43
1/24	42	7/23	32	1/19	60	7/24	--
1/30	85	7/29	53	1/25	36	7/30	50
2/5	72	8/4	36	1/31	64	8/5	40
2/11	85	8/10	57	2/6	54	8/11	44
2/17	61	8/16	27	2/12	64	8/17	42
2/23	75	8/22	65	2/18	85	8/23	33
3/1	53	8/28	45	2/24	48	8/29	25
3/7	50	9/3	52	3/2	48	9/6	55
3/13	64	9/9	76	3/8	60	9/12	--
3/19	126	9/15	119*	3/14	43	9/18	--
3/25	53	9/21	47	3/20	38	9/24	29
3/31	65	9/27	82	3/26	40	9/30	35
4/6	--	10/3	99	4/1	48	10/6	38
4/12	--	10/9	67	4/7	--	10/12	88
4/18	54	10/15	59	4/13	49	10/18	44
4/24	33	10/21	89	4/19	89	10/24	51
4/30	80	10/27	51	4/25	26	10/30/79	40
5/6	44	11/2	111	5/1	32		
5/12	44	11/10	56	5/7	14		
5/18	64	11/16	51	5/13	--	n =	99
5/24	62	11/22	86	5/19	64	$\bar{x}_g =$	53.6
5/30	--	11/26	49	5/25	--		
6/5	51	12/2	31	5/31	--		
6/11	56	12/8	52	6/6	67		
6/17	46	12/14	114	6/12	78		
6/23	35	12/20	62	6/18	64		
6/30	63	12/26/78	--	6/24	81		
				6/30	61		

* Second-high 24-hour SO_2 concentration.

2.0 AIR QUALITY IMPACT ANALYSIS

2.1 Introduction

Air quality modeling has been conducted to evaluate the impact of sulfur dioxide and particulate matter emissions from the expanded Agrico facility. The baseline concentration for these pollutants and the impact of new or modified sources (all major sources constructed since January 6, 1975 and all sources since August 7, 1977) have been established by air quality modeling. The impact of new or modified sources within the area of the Agrico chemical complex have been included in the air quality impact analysis.

The air quality modeling for both long-term and short-term impacts was conducted in accordance with guidelines established by EPA (Guideline for Air Quality Models, March 1978).

For sulfur dioxide the annual, the 24-hour and the 3-hour time periods were investigated. With particulate matter the annual period and the 24-hour period were evaluated.

The annual period was evaluated by using the Air Quality Display Model (AQDM). Meteorological data from Tampa for the period 1970-1974 were used.

For the 24-hour and 3-hour periods, the CRSTER and PTMTPW models were used. The CRSTER was used to establish the area of significant impact and the meteorological conditions resulting in the highest second-high impacts in various directions from the fertilizer complex. Once the meteorological conditions were established, these data plus emission

data from various sources were input into the PTMTPW model and the maximum impacts were determined. Receptor spacing of 0.1 km were used in determining the point of maximum impact.

The results of the modeling are summarized in Table 2-1 and various Figures. The computer print-outs for all of the air quality modeling are bound as a separate document.

2.2 Impact Analysis

The short-term impact is defined as the 3-hour and 24-hour impact of pollutants emitted from sources in the study area. The short-term impact analysis was conducted with the CRSTER and PTMTPW air quality models.

The CRSTER model was run first using as input the emission data from the proposed sources and meteorological data for the period 1970-1974 from Tampa, Florida. The receptor distances in the CRSTER model were set to predict the point of maximum impact and also the boundary of the area of significant impact of the proposed sources. Significant, as it is used in this context, is defined in Table 2-2. The areas of significant impact for sulfur dioxide and particulate matter are shown in Figures 2-1 and 2-2 respectively.

Air pollutant emissions from all major sources within and well beyond the boundary of the area of significant impact of the SPCW were included in the impact studies.

The emission inventory for sulfur dioxide and particulate matter in the area of influence was developed from data on file at the Florida Department of Environmental Regulation District Office in Tampa, Florida. These files were reviewed source by source to develop an emission inventory which is as realistic as possible.

Meteorological data for evaluating the 3-hour and 24-hour pollutant levels in the ambient air were selected from the CRSTER model output. Meteorological data resulting in the highest second-high 24-hour pollutant concentrations in several directions from the SPCW were selected for evaluating particulate matter and sulfur dioxide impacts. Meteorological conditions resulting in the highest second-high 3-hour sulfur dioxide impacts in several directions from the chemical complex were also selected for further investigation.

The long-term impact is defined as the annual average impact of pollutants emitted from sources within the study area. The long-term impact analysis was conducted with the AQDM. The input data to the AQDM included emission data for sulfur dioxide and particulate matter resulting from all sources within approximately 50 km of the SPCW. This includes sources outside the area of significant impact of the proposed Agrico sources.

The meteorological data input to the AQDM were for the 1970-1974 period from Tampa, Florida. These data were in the STAR format with five stability classes. Receptor spacing used in the AQDM was 1.0 km.

2.2.1 Particulate Matter Impact Analysis

2.2.1.1 Short-Term Particulate Matter Impact

The CRSTER was run twice with particulate matter data from the Agrico sources and meteorological data for the period 1970-1974 from Tampa, Florida. From the first run it was found that the maximum 24-hour impact from proposed sources was significant (> 5 micrograms per cubic meter) and occurred at a direction of 90° from north from the proposed chemical complex at a distance of approximately 1.0 km. The meteorological data resulting in this impact was day 173, 1972. With the same set of CRSTER runs, the area of significant impact of the proposed sources was determined. The results of this preliminary analysis indicated that the average annual impact of the particulate matter emitted from the proposed sources was not significant at any distance and that the 24-hour impact dropped to an insignificant level at 2.0 km. These data are summarized in Figure 2-2. It can be seen from Figure 2-2 that the particulate matter emitted from the proposed sources will not significantly impact either the particulate matter non-attainment area in Hillsborough County or any Class I areas.

With the second set of CRSTER runs, particulate matter emissions from all Agrico sources were input with 1970-1974 Tampa meteorological data. From this series of runs the meteorology resulting in the highest second-high impact was determined. Other directions were also investigated to account for the combined influence of the Agrico sources and other sources which would be aligned during the occurrence of certain wind directions. The directions evaluated and the meteorological conditions resulting in the highest second-high impact for each are presented in Figure 2-3.

The particulate matter emission inventory used for the air quality impact analysis included all major sources within approximately 50 km radius of the Agrico plant site. This includes sources well outside the area of influence of the proposed sources.

With critical meteorological conditions established and an emission inventory developed, the air quality model PTMPW was utilized. Meteorological data were input to the PTMPW with emission data from the Agrico sources and sources upwind of Agrico. The model was run for each of the conditions depicted in Figure 2-3. From these runs the baseline particulate matter levels, the new source impact and the combined impact of existing and new sources were determined. These data are summarized in Figure 2-4 and Table 2-3.

These data show that the maximum 24-hour particulate matter impact from the proposed sources is 6.5 micrograms per cubic meter at a location 1.5 kilometers east of the chemical complex. This impact occurred with meteorology representative of day 173, 1972. The maximum 24-hour point source particulate matter impact occurring near the South Pierce Chemical Complex was calculated to be 49 micrograms per cubic meter. This occurred with a westerly wind and was a result of the impact of Agrico sources only. When combined with the 24-hour particulate matter background of 60 micrograms per cubic meter the resulting maximum expected 24-hour particulate matter level is 109 micrograms per cubic meter. This is below the Florida 24-hour particulate matter standard of 150 micrograms per cubic meter.

In establishing the point of maximum impact, receptor spacings of 0.1 km were used.

2.2.1.2 Long-Term Particulate Matter Impact

The CRSTER model showed that the annual impact of the proposed sources would not be significant at any location. Because of this, no further annual average modeling was done for particulate matter emissions.

2.2.2 Sulfur Dioxide Impact Analysis

2.2.2.1 Short-Term Sulfur Dioxide Impact

The short-term impact analysis for sulfur dioxide involved a 24-hour impact analysis and a 3-hour impact analysis. These time periods correspond to applicable ambient air quality standards.

As with the particulate matter analysis, the CRSTER model was run multiple times with sulfur dioxide emission data for the proposed Agrico sources and meteorological data for the period 1970-1974 for Tampa, Florida. On the first set of runs the receptors were set to determine the maximum air quality impact of the proposed sources. From this run the meteorological conditions resulting in the highest second-high 24-hour and 3-hour impacts at several locations were selected. The locations selected represented the direction to the maximum highest second-high concentration for both the 24-hour and 3-hour periods and directions that would allow investigation of the combined impacts of Agrico sources and other sources which would be aligned with Agrico during the occurrence of various wind directions. The direction selected for evaluation and the meteorological conditions resulting in the highest second-high impact for each direction are presented in Figure 2-5 for the 24-hour sulfur dioxide impact analysis and in Figure 2-6 for the 3-hour sulfur dioxide impact analysis.

The second series of runs with the CRSTER model were made to determine the area of significant impact of the proposed sources. The distance to the boundary of the area of annual significant impact was determined to be 14 km; distance to the boundary for the 24-hour period was 26 km and for the 3-hour period 27 km. The areas of significant influence are shown in Figure 2-1 along with the Pinellas County sulfur dioxide non-attainment area and the Class I PSD area nearest the Agrico plant site.

It can be seen that the proposed sources do not impact significantly on either the non-attainment area or the Class I area.

The sulfur dioxide emission inventory used for the air quality impact analysis included all major sources within approximately 50 km of the Agrico site.

The critical meteorological conditions established with the CRSTER model and the emission inventory were input to the PTMTPW model to determine the maximum impact for each condition investigated. The receptor spacing used for determining the point of maximum impact was 0.1 km. The results of these runs are summarized in Table 2-4 and Figures 2-7 and 2-8.

2.2.2.2 Long-Term Sulfur Dioxide Impact

The AQDM was run once to determine baseline sulfur dioxide levels and a second time to determine the impact of new and proposed sources. The impact of existing and new sources was determined by summing the impacts of the existing and new sources.

The annual average sulfur dioxide levels for all sources, baseline sources, and new and proposed sources are summarized in Figures 2-9 through 2-11 respectively.

2.2.3 Other Pollutant Impact Analyses

The sources proposed by Agrico which are subject to a Tier II review are the sulfuric acid plant and the DAP plant for sulfur dioxide, the DAP plant, the MAP/DAP plant and the DAP storage and shipping for particulate matter and the sulfuric acid plant for acid mist. No other source is subject to a Tier II review for any other pollutant, and hence, the impact of no other pollutant must be investigated.

Since there are no short-term or long-term ambient air quality standards for acid mist, no air quality impact analyses were conducted for this pollutant.

2.3 Impact of Fluoride Emissions

Fluorides in ambient air have been defined by EPA to be a welfare related pollutant as opposed to a health related pollutant⁽¹⁾. This is to say that fluoride levels as observed in the ambient air in the U.S. have not caused any health related effects. Effects on non-human receptors have been noted however.

When fluorides are emitted into the atmosphere in large volumes they have a tendency to accumulate in various types of vegetation and in some cases cause damage to the vegetation. A secondary effect of the accumulation of fluorides in vegetation occurs when vegetation is consumed by foraging animals. If the animals consume sufficient quantities of the fluoride, damage to teeth and bones, known as fluorosis, can occur.

In the phosphate fertilizer industry all point sources of fluorides have been controlled for quite some time. As a result of this, welfare related effects have virtually been non-existent. In 1978 an Environmental Impact Statement was prepared to describe the environmental effects of a proposed phosphate fertilizer plant expansion⁽²⁾. One phase of the EIS involved investigating the effects of fluorides on the environment surrounding the existing plant. The study concluded that no adverse economic effects resulted from fluoride emissions from the fertilizer complex. The complex included phosphoric acid plants, granular fertilizer product plants and a cooling pond and gypsum stack.

At the time this study was conducted, the existing fertilizer plant which was the subject of the study, had a capacity of 550,000 tons per year of P_2O_5 . The proposed Agrico SPCW will have a capacity of approximately 625,000 tons per year of P_2O_5 .

Furthermore, Agrico has received no complaints of damage to cattle, citrus or other crops as a result of fluoride emissions from their existing facility. This is significant since the point source fluoride emissions from the entire chemical complex was approximately 60 tons per year through mid-1977. Under conditions of the proposed expansion the allowable emissions will decrease to approximately 40 tons per year and emissions from the pond will increase about five tons per year. The net result will be a significant reduction in fluoride emissions from the SPCW.

Since Agrico has received no complaints and noted no fluoride damage in the past, it is doubtful that environmental problems will result from future operations of the SPCW since fluoride emissions are being reduced.

2.4 Conclusion

The results of all air quality modeling have been summarized in Table 2-1. These data show that the expansion proposed by Agrico will not threaten particulate matter or sulfur dioxide air quality standards. Neither will the expansion threaten Class II PSD increments, significantly impact non-attainment areas for sulfur dioxide or particulate matter nor significantly impact Class I areas.

TABLE 2-1

BEST AVAILABLE COPY

SUMMARY OF AIR QUALITY ANALYSIS(1)
 AGRICO CHEMICAL COMPANY
 POLK COUNTY, FLORIDA

Pollutant/ Time	Air Quality			Class II Increment (ug/m ³)	PSD		Non-Attainment Impact Area Calculated Impact (ug/m ³)
	Fla. AADS (ug/m ³)	Baseline (ug/m ³)	With New & Existing Sources (ug/m ³)		Calculated Increment (ug/m ³)	Fraction Increment Consumed	
SP							
Annual (2)	60						
24-Hour (3)	150	107	109	37	6	17.6%	<1
SO ₂							
Annual	60	15	19	20	4	20.0%	<1
24-Hour	260	101	143	91	42	46.1%	<1
3-Hour	1300	285	390	512	105	20.5%	<1

(1) Only the maximum impacts or pollutants levels are summarized in this Table. See Figures and Table following for more detailed information.

(2) Not calculated since annual impact is not significant.

(3) Calculated concentrations include 60 ug/m³ background.

TABLE 2-2

DEFINITION OF SIGNIFICANT AIR QUALITY IMPACT

<u>Pollutant/ Time</u>	<u>Significant Impacts are Impacts Exceeding: (ug/m³)</u>
Particulate Matter	
Annual	1
24-Hour	5
SO ₂	
Annual	1
24-Hour	5
3-Hour	25

TABLE 2-3

AIR QUALITY IMPACT ANALYSIS
OF PARTICULATE MATTER EMISSIONS
AGRICO CHEMICAL COMPANY
POLK COUNTY, FLORIDA

Case	Max. Conc. (ug/m ³)	Receptor		Model Run Number
		UTM East (km)	UTM North (km)	
24-Hr TSP	(Total Concentrations[t] include 60 ug/m ³ TSP background. New Source [ns] impact is incremental impact only)			
1t	109	408.9	3071.4	10
1ns	6	408.9	3071.6	11
2t	104	408.3	3070.8	12
2ns	5	408.3	3070.8	12
3t	103	407.5	3069.8	13
3ns	3	407.5	3069.8	13

TABLE 2-4

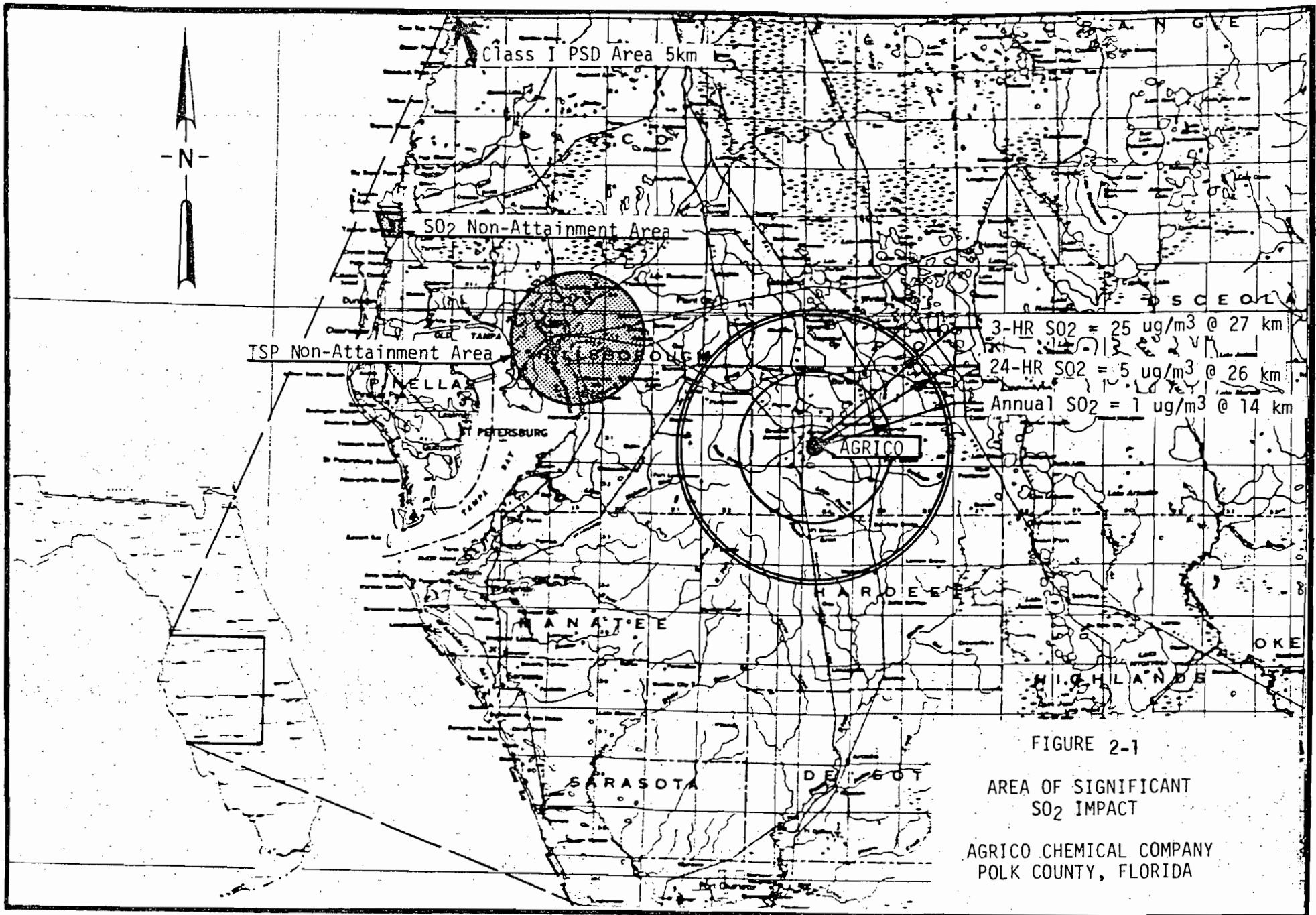
AIR QUALITY IMPACT ANALYSIS
OF SULFUR DIOXIDE EMISSIONS
AGRICOLA CHEMICAL COMPANY
POLK COUNTY, FLORIDA

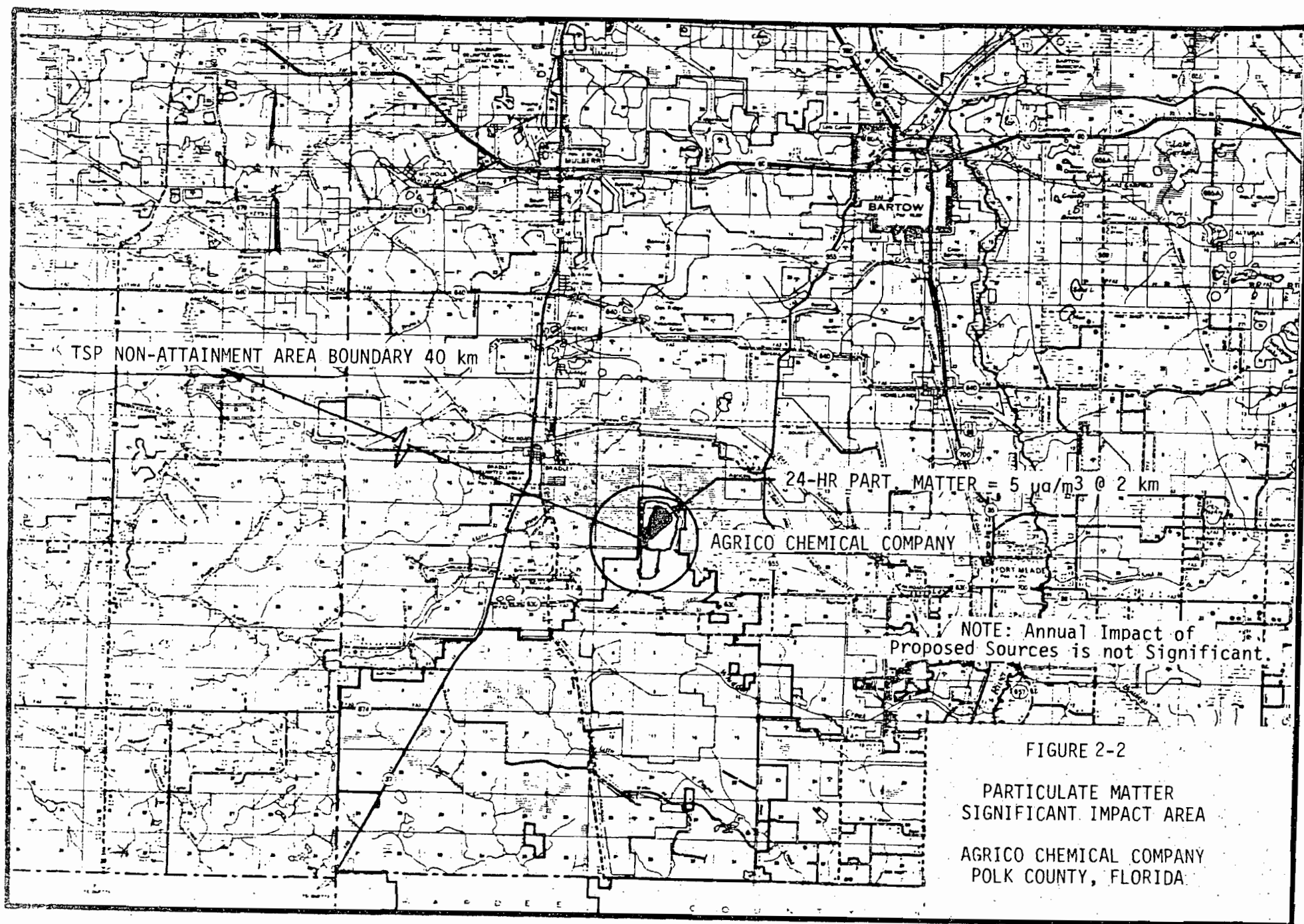
Case	Max. Conc. (ug/m ³)	Receptor		Model Run Number
		UTM East (km)	UTM North (km)	
<hr/>				
24-Hr <u>S0₂</u>	(Background = 0)			
1t	153	409.3	3071.3	20
1ns	42	409.4	3071.4	21
2t	98	408.6	3070.6	22
2ns	29	408.6	3070.7	23
3t	117	407.6	3069.4	24
3ns	25	407.6	3068.8	25
3-Hr <u>S0₂</u>	(Background = 0)			
1t	390	408.4	3071.4	30
1ns	105	408.6	3071.4	31
2t	274	408.5	3070.7	32
2ns	80	408.5	3070.8	33
3t	256	407.5	3070.2	34
3ns	72	407.6	3070.3	35
Annual <u>S0₂</u>	(Background = 0)			
1t	19	406.0	3071.0	100+101
1bl	15	406.0	3071.0	100
1ns	4	406.0	3071.0	101

t = Ground level concentration resulting from existing, new and proposed sources.

bl = Ground level concentrations resulting from existing sources (Pre 1/6/75).

ns = Impact of new and proposed sources.





AGRICO — AGRICO CHEMICAL CO.
 BORDEN — BORDEN, INC.
 B.P. — BREWSTER PHOSPHATES
 C.F.I. — C.F. INDUSTRIES
 CONSERV — CONSERV
 E-P.C. — ELECTRO-PHOS CORP.
 F.L.I. — FARMLAND INDUSTRIES, INC.
 GARDINIER — GARDINIER, INC.
 GRACE — W.R. GRACE & CO.
 IMC — INTERNATIONAL MINERALS
 & CHEMICAL CORP.

MOBIL — MOBIL CHEMICAL CO.
 ROYSTER — ROYSTER CO.
 SWIFT — SWIFT AGRICULTURAL CHEMICAL CORP.
 T/A M. — T/A MINERALS CORP.
 U.R.C. — URANIUM RECOVERY CORP.
 USS — USS AGRI-CHEMICALS

■ — MINERALS PROCESSING PLANT
 ● — CHEMICAL PLANT
 ▲ — MARINE LOADING TERMINAL

SCALE IN MILES
0 1 2 3 4 5 6 7 8 9 10

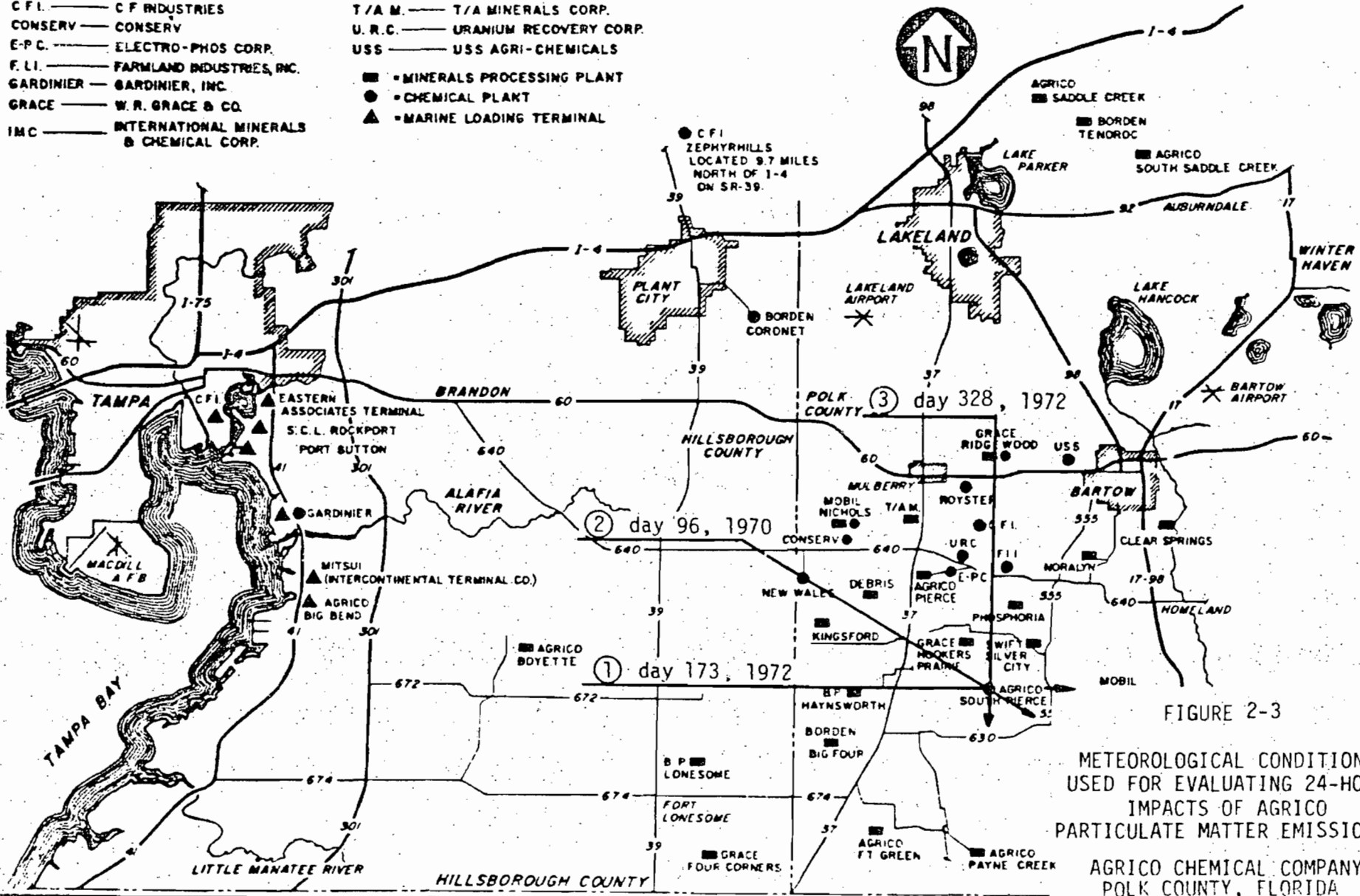


FIGURE 2-3

METEOROLOGICAL CONDITIONS
 USED FOR EVALUATING 24-HOUR
 IMPACTS OF AGRICO
 PARTICULATE MATTER EMISSIONS

AGRICO CHEMICAL COMPANY
 POLK COUNTY, FLORIDA

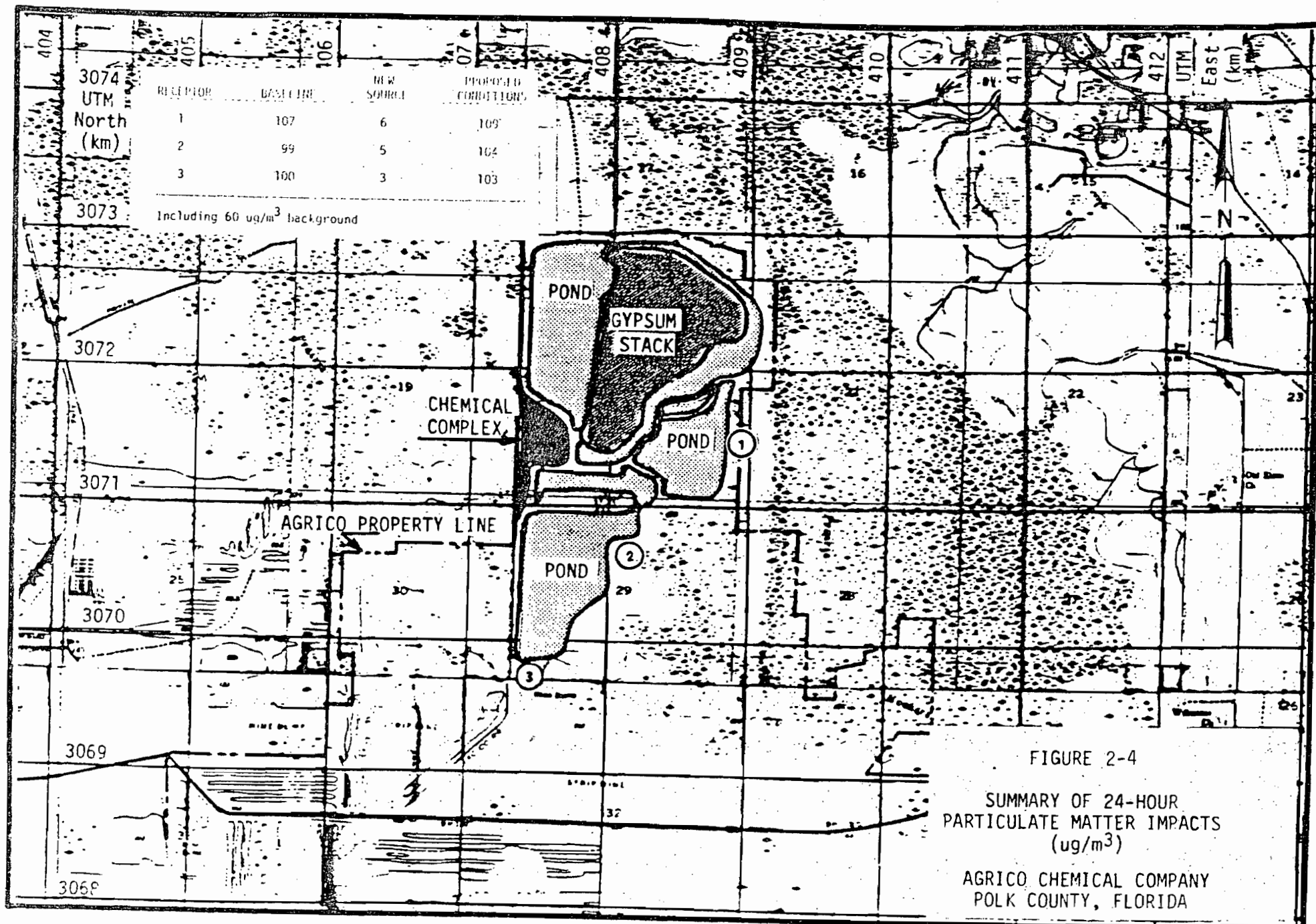
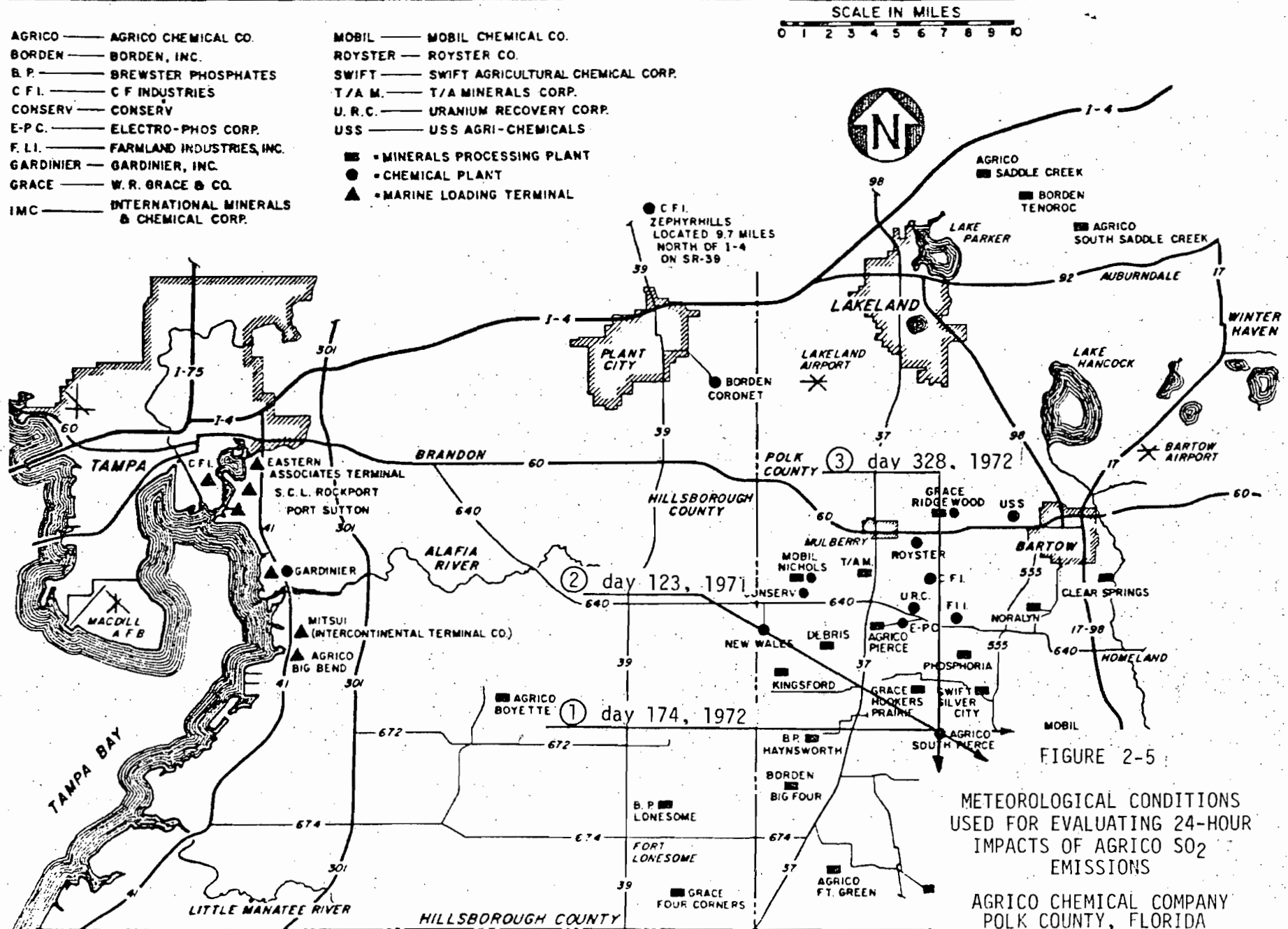


FIGURE 2-4
SUMMARY OF 24-HOUR
PARTICULATE MATTER IMPACTS
(ug/m³)
AGRICO CHEMICAL COMPANY
POLK COUNTY, FLORIDA



AGRICO — AGRICO CHEMICAL CO.
 BORDEN — BORDEN, INC.
 B.P. — BREWSTER PHOSPHATES
 C.F.I. — C F INDUSTRIES
 CONSERV — CONSERV
 E-P.C. — ELECTRO-PHOS CORP.
 F.L.I. — FARMLAND INDUSTRIES, INC.
 GARDINIER — GARDINIER, INC.
 GRACE — W. R. GRACE & CO.
 IMC — INTERNATIONAL MINERALS
 & CHEMICAL CORP.

MOBIL — MOBIL CHEMICAL CO.
 ROYSTER — ROYSTER CO.
 SWIFT — SWIFT AGRICULTURAL CHEMICAL CORP.
 T/A M. — T/A MINERALS CORP.
 U.R.C. — URANIUM RECOVERY CORP.
 USS — USS AGRI-CHEMICALS

■ — MINERALS PROCESSING PLANT
 ● — CHEMICAL PLANT
 ▲ — MARINE LOADING TERMINAL

SCALE IN MILES
0 1 2 3 4 5 6 7 8 9 10

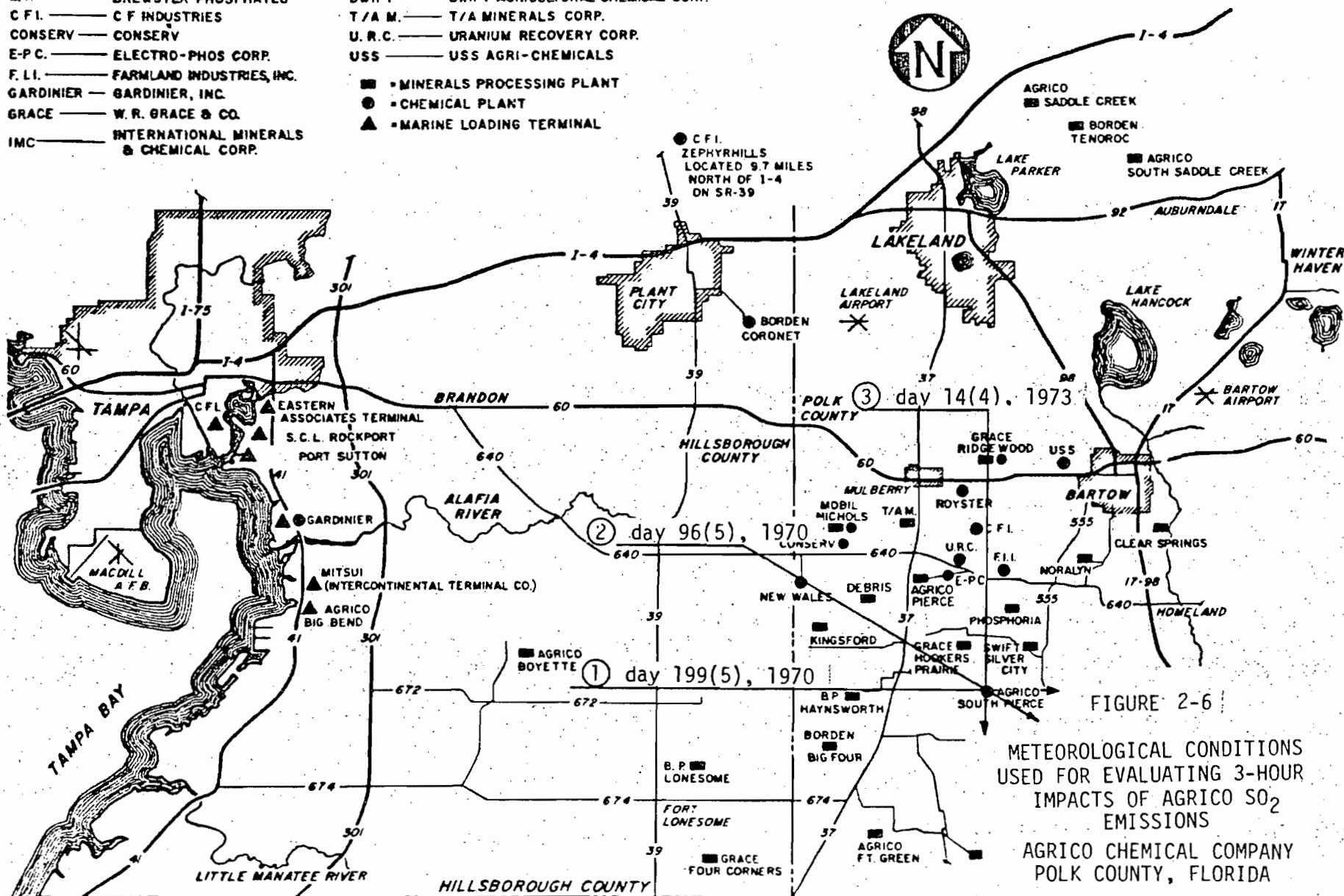
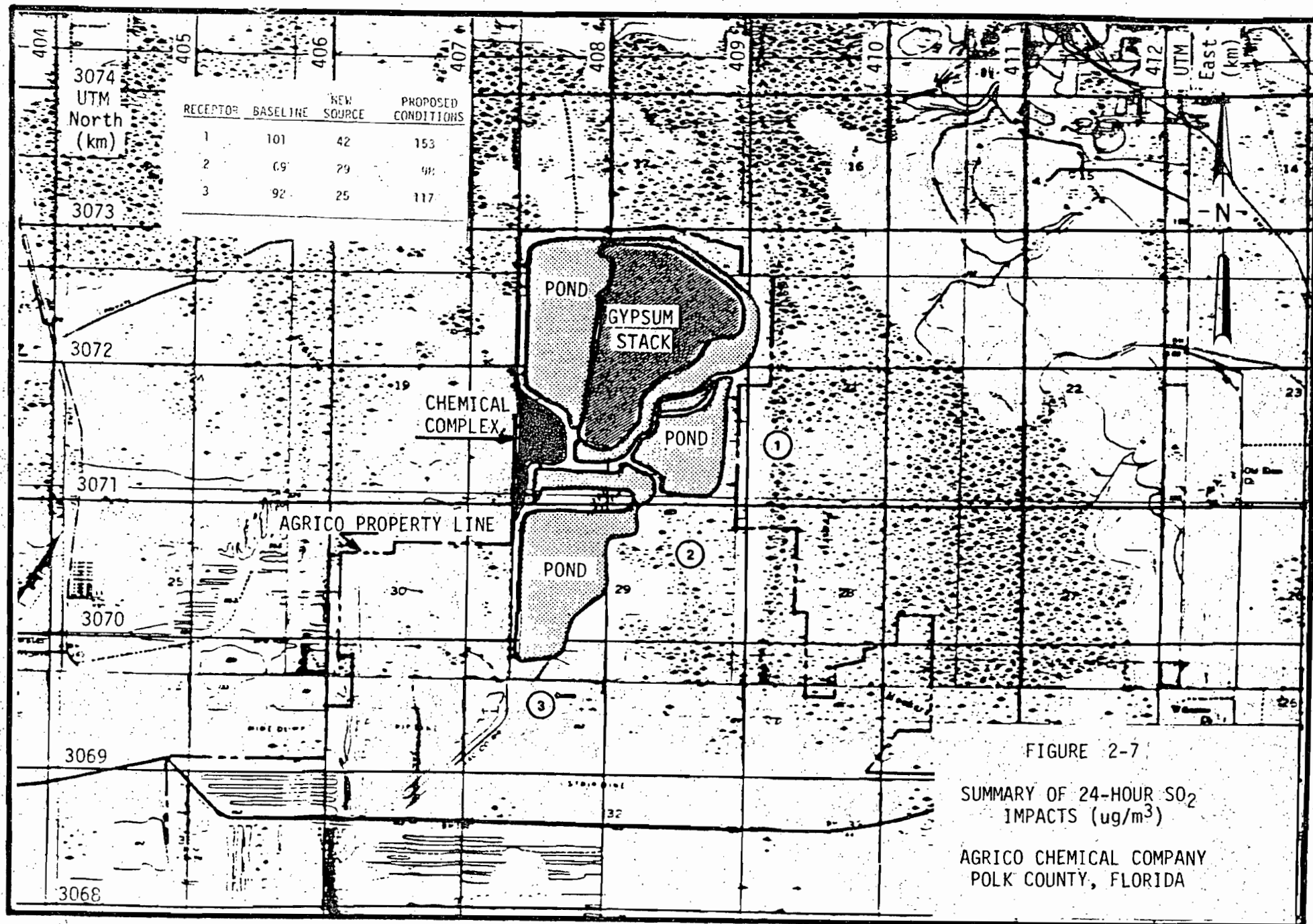
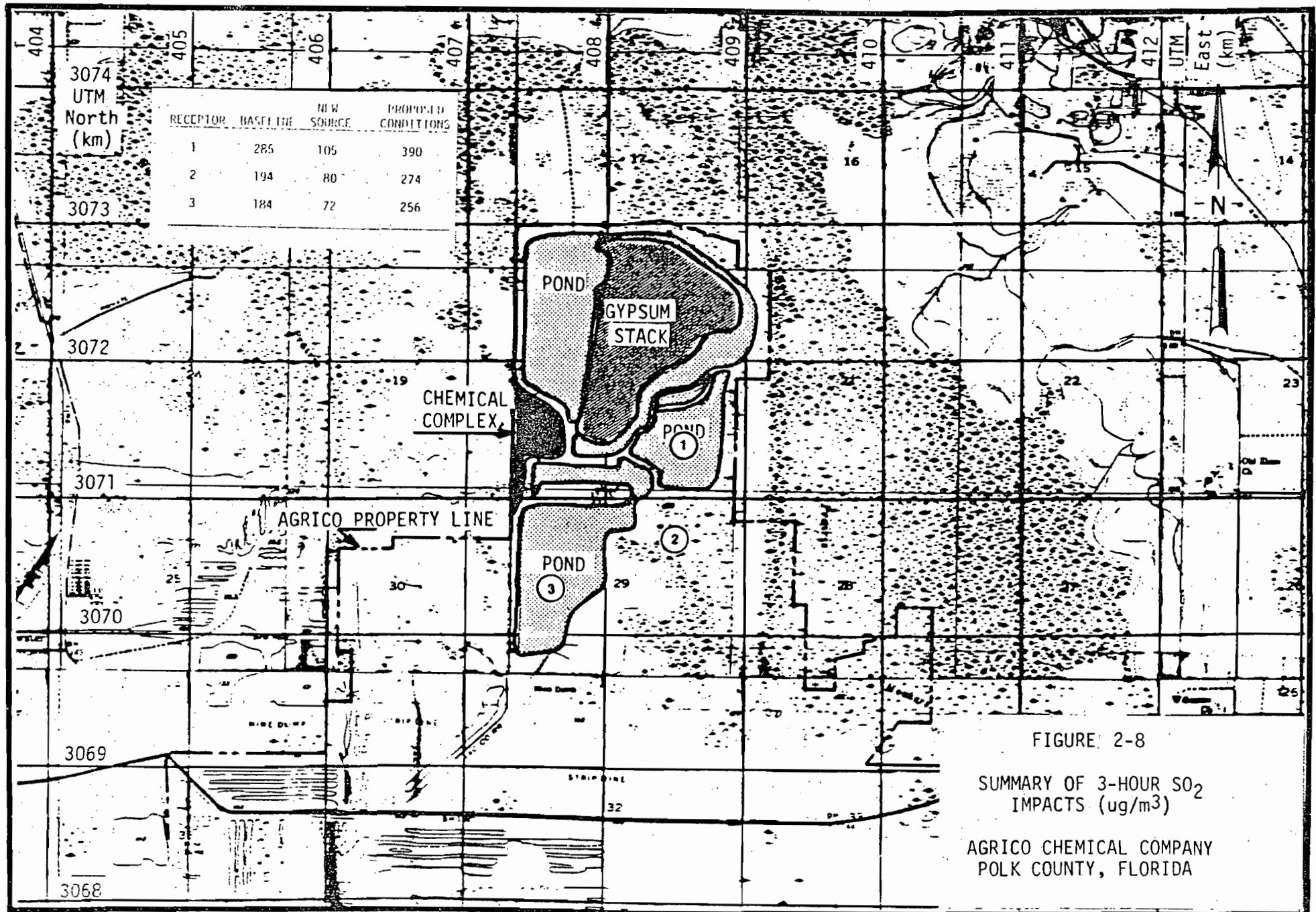


FIGURE 2-6

METEOROLOGICAL CONDITIONS
 USED FOR EVALUATING 3-HOUR
 IMPACTS OF AGRICO SO₂
 EMISSIONS

AGRICO CHEMICAL COMPANY
 POLK COUNTY, FLORIDA





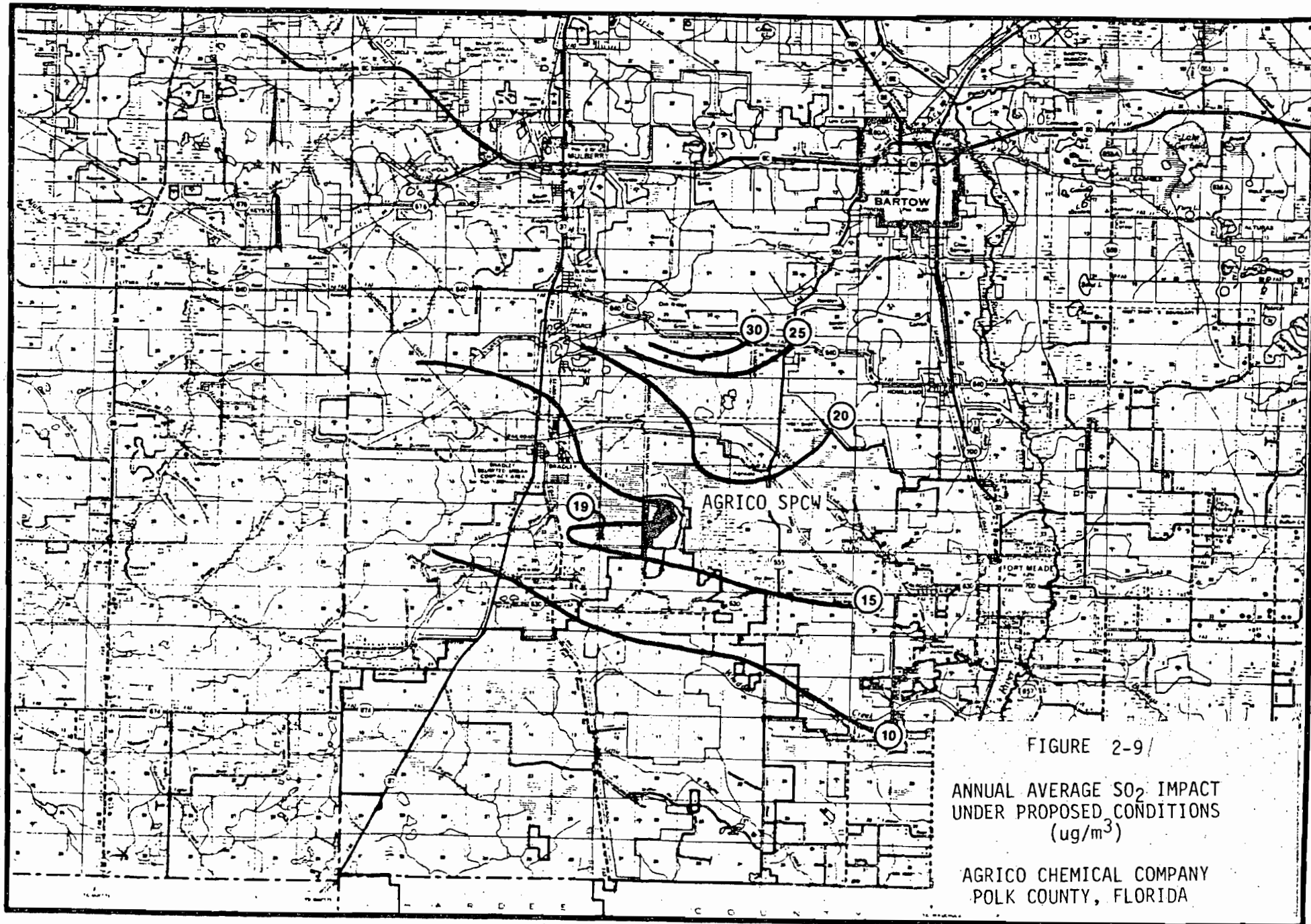
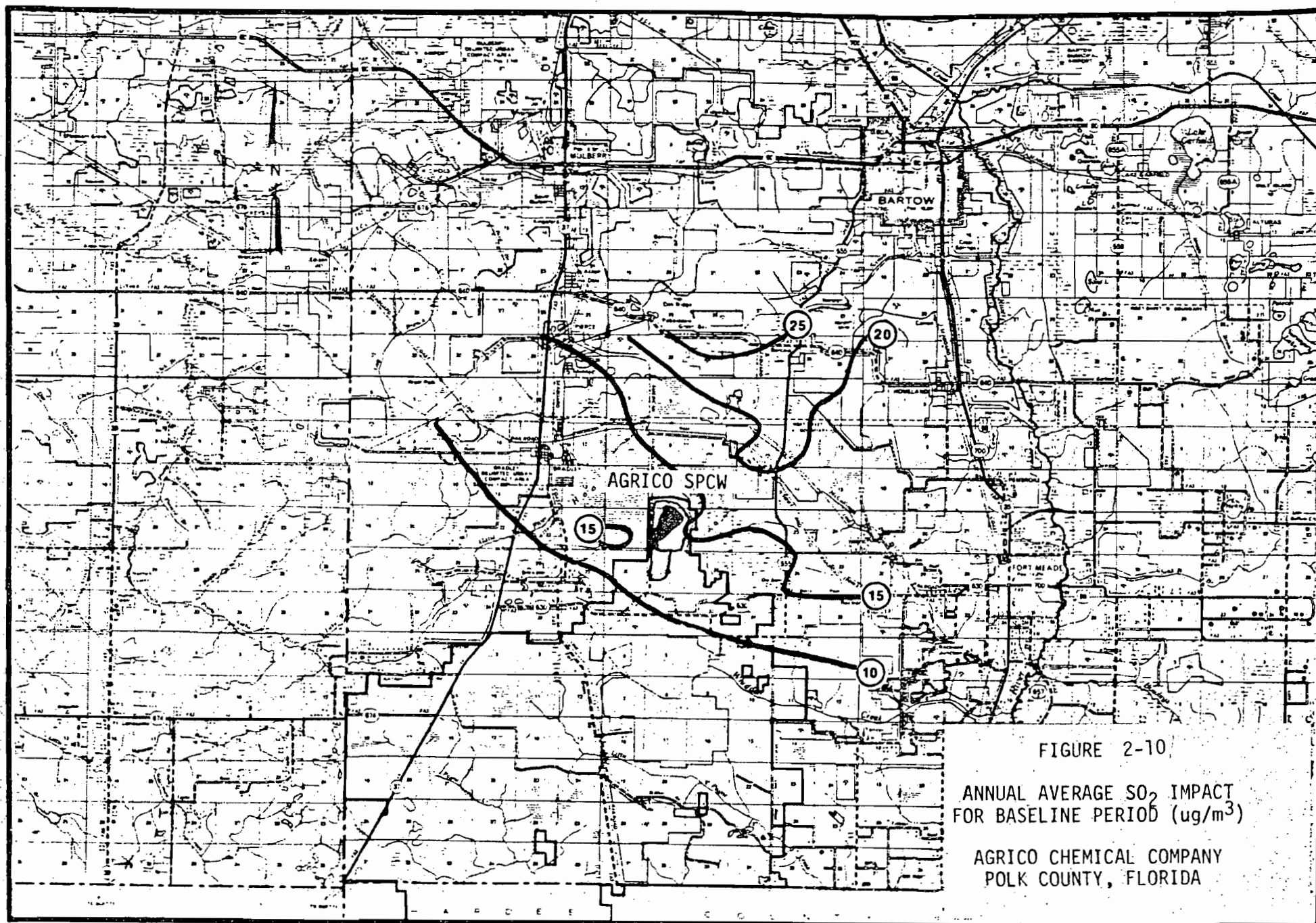
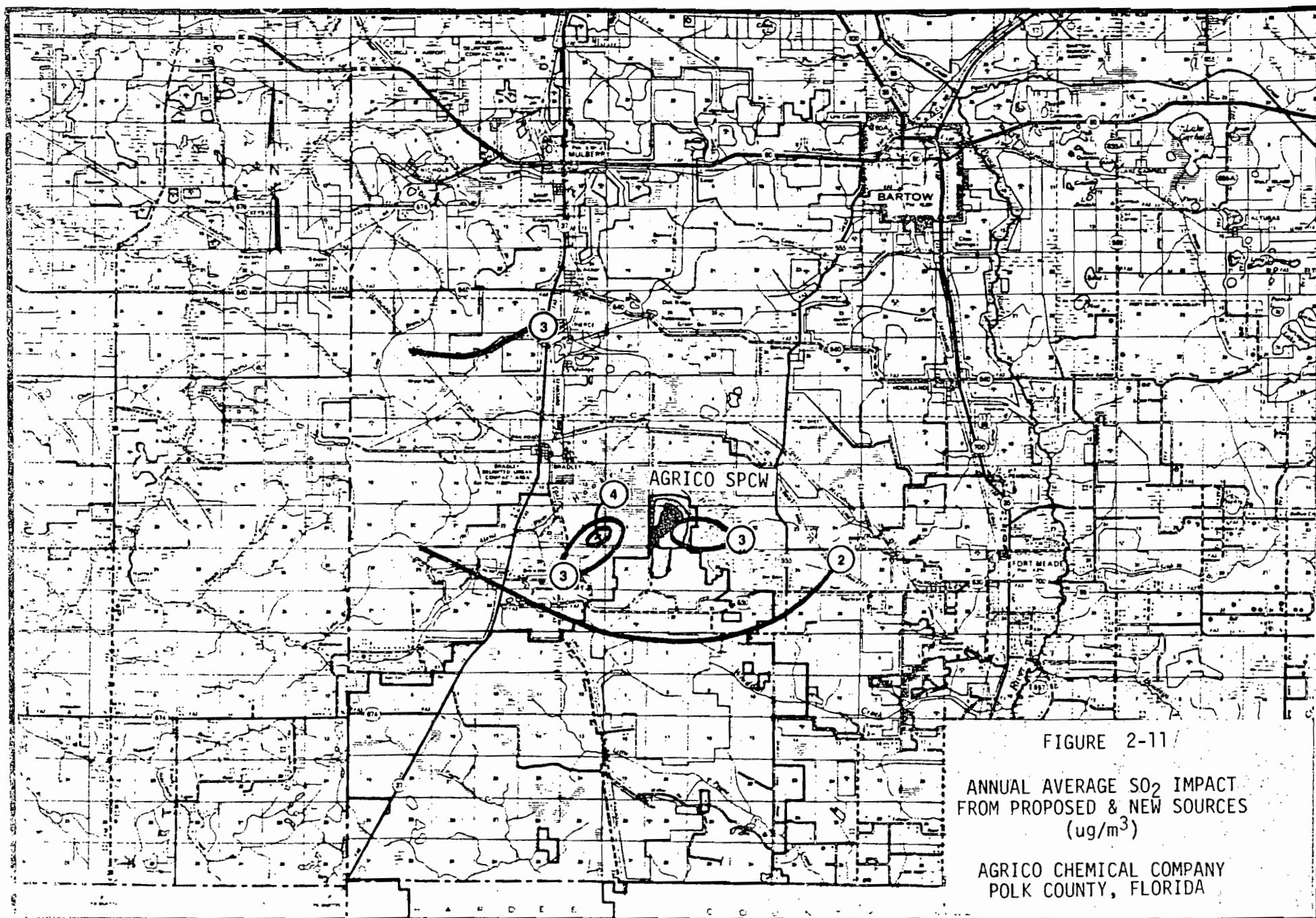


FIGURE 2-9/

ANNUAL AVERAGE SO₂ IMPACT
UNDER PROPOSED CONDITIONS
($\mu\text{g}/\text{m}^3$)

AGRICO CHEMICAL COMPANY
POLK COUNTY, FLORIDA





3.0 SECONDARY IMPACTS

3.1 Introduction

A qualitative evaluation of the proposed expansion on soils, vegetation, visibility and commercial growth in the area has been prepared.

3.2 Particulate Matter and Sulfur Dioxide

Air quality modeling has demonstrated that particulate matter and sulfur dioxide levels after the proposed expansion will be well below the national secondary air quality standards. Since these standards were promulgated to protect welfare related values, it is projected that the proposed expansion will not adversely impact soils, vegetation and visibility in the surrounding area.

3.3 Nitrogen Oxides

Since nitrogen oxide emissions from the proposed sources are only five percent of the sulfur dioxide emissions and since the annual average sulfur dioxide impact of the proposed sources is only four micrograms per cubic meter, the ambient nitrogen oxides concentration resulting from emissions from the proposed sources will be approximately five percent of four micrograms per cubic meter or 0.2 micrograms per cubic meter. At this level no secondary impact is anticipated.

3.4 Fluorides

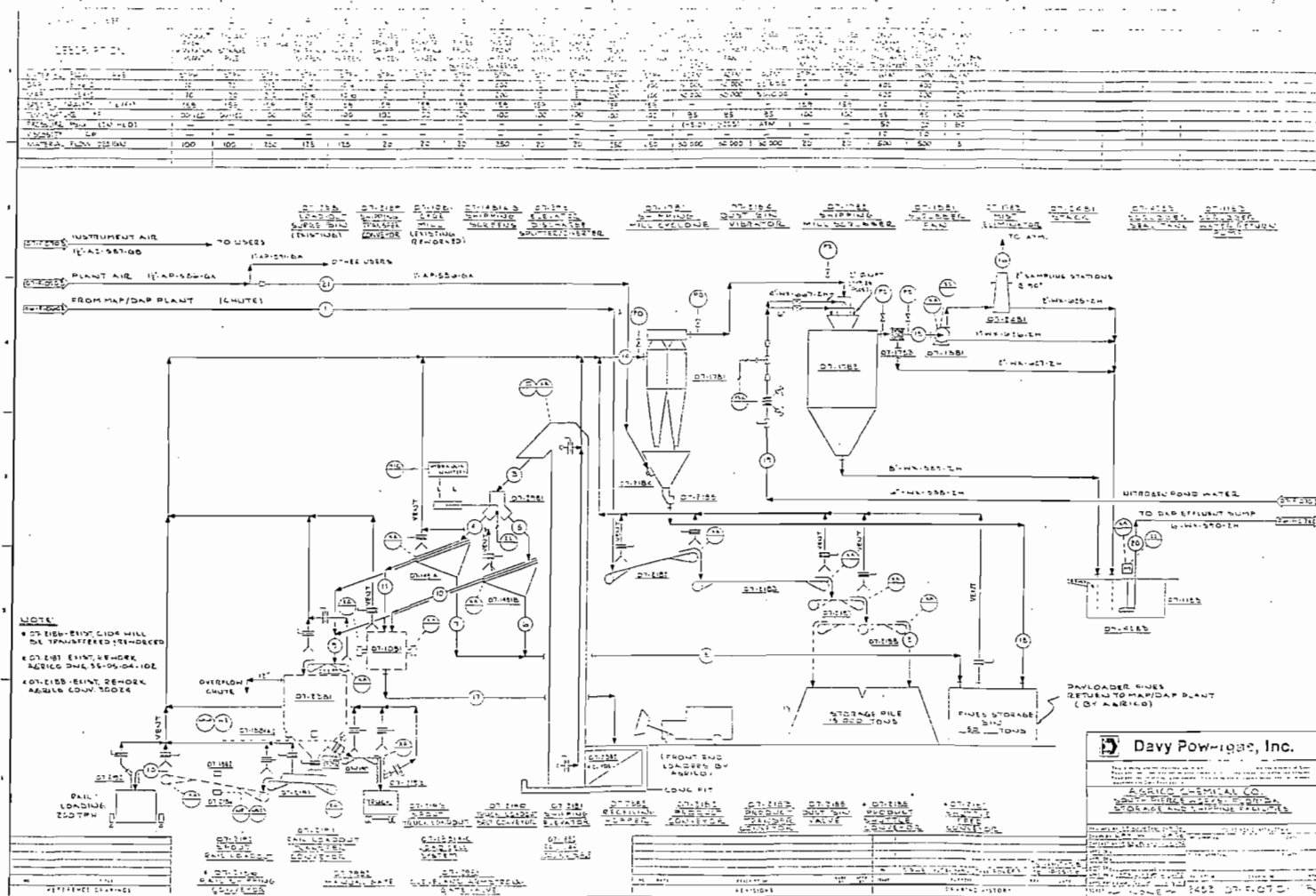
The fluoride emissions from the proposed modification are not expected to create any adverse secondary impacts. An Environmental Impact Statement recently submitted for a phosphate fertilizer complex in north Florida

(Environmental Impact Statement, Occidental Chemical Company Swift Creek Chemical Complex, Hamilton County, Florida, US EPA, Region IV, Atlanta, Georgia, July 1978) includes a section on the environmental impact of fluoride emissions. In this document it states that no significant impact to cattle, agricultural crops or timber was established

Property for several miles in all directions from Agrico is owned by phosphate interests. The closest non-phosphate company owned property on which there is a fluoride sensitive receptor; citrus, is located four kilometers southeast of Agrico. Agrico has not received any complaints from the grove owner related to emissions from the chemical complex or cooling ponds. This is significant since the point source fluoride emissions rate from the entire chemical complex prior to the program of replacing older plants with latest technology (mid-1977) was about 60 tons per year.

Under the conditions of the proposed expansion the fluoride emission rate from all point sources in the SPCW will decrease to approximately 40 tons per year. Since there will be an overall reduction in fluoride emissions from point sources and since the emissions from the ponds will increase only slightly (approximately five tons per year) it is doubtful that any fluoride related impacts will be observed in the future.

BEST AVAILABLE COPY



June 28, 1982

Mr. J. C. Lahman, Plant Manager
Agrico Chemical Company
P.O. Box 1969
Bartow, Florida 33830

Dear Mr. Lahman:

The request for extension of the expiration date of the state construction permits submitted by Mr. Lawrence N. Curtin of Holland & Knight on behalf of Agrico Chemical Company has been reviewed and the following findings noted.

1. State applications for permits to construct were reviewed and construction permits issued based on the air pollution control regulations in effect on January 30, 1981. Time required to construct the sources was listed in the applications. The state permits issued allowed sufficient time for construction or modification, start of operations, and compliance testing. This data is summarized in the following table.

<u>Permit No.</u>	<u>Source</u>	<u>Construction Time</u>	<u>Issue Date</u>	<u>Expiration Date</u>
AC53-34868	Phos. Acid Plant	15 months	1/30/81	6/30/82
AC53-34871	Sulfuric Acid Plant	24 months	1/30/81	3/30/83
AC53-34861	DAP Plant	22 months	1/30/81	1/30/83
AC53-34865	DAP Storage/ Shipping	22 months	1/30/81	1/30/83

Mr. J. C. Lahman
June 28, 1982
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2. A state permit to construct a purified MAP/DAP facility at the same phosphate fertilizer complex was issued by the Department's Southwest District Office (AC53-42155, issued July 17, 1981, expires December 15, 1982).
3. Construction of the purified MAP/DAP facility is proceeding in accordance with state permit, AC53-42155.
4. Construction/modification of the sources listed in 1 above has been delayed at the Company's option, because of the economic conditions associated with a decline in sales of fertilizer products.
5. Agrico Chemical Company, through its agent at Holland & Knight, is requesting that the expiration date of the construction permits for the four sources listed in 1 be extended to December 31, 1985.

Based on the proceeding facts, the Department has reached the following conclusion.

1. Agrico Chemical Company plans to handle the construction/modification allowed by the 5 state permits mentioned earlier in phases with the purified MAP/DAP facility being constructed first and the other sources built at a later date. All sources will be completed and tested by December 31, 1985.
2. This phased construction makes the source subject to Section 17-2.630(3), FAC, Phased Construction Project. This rule requires the owner or operator of the facility to demonstrate the adequacy of any previous determination of BACT before beginning construction.
3. All modifications to permit conditions are subject to Section 17-4.08, FAC. This rule allows the Department to require the permittee to comply with new or additional conditions, for good cause.

Pursuant to Section 17-2.630(3), FAC, and Section 17-4.08, FAC, the Department will extend the expiration dates of the state construction permits as requested and require the agent for the source to demonstrate the adequacy of all BACT determinations for

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Mr. J. C. Lahman
June 28, 1982
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there permits before beginning construction. The Department reserved the right to add new or additional conditions, with good cause, if needed to protect the ambient air quality from the impact of the new/modified sources.

A copy of this letter must be attached to each affected construction permit and it becomes a part of that permit. The affected permit numbers are listed below.

<u>Permit No.</u>	<u>Original Expiration Date</u>	<u>Modified Expiration Date</u>
AC53-34868	6/30/82	12/31/85
AC53-34871	3/30/83	12/31/85
AC53-34861	1/30/83	12/31/85
AC53-34865	1/30/83	12/31/85

Sincerely,

/s/Victoria J. Tschinkel

Victoria J. Tschinkel
Secretary

VT:CF:ras

cc: Southwest District
Holland & Knight