BEST AVAILABLE COPY

AC24460

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

DER
OCT 9 1979
SOUTHWEST DISTRICT
TAMPA

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: DAP/Fertilizer Plant [X] New[1] [ ] Existing[1]

APPLICATION TYPE: [X] Construction [ ] Operation [ ] Modification

COMPANY NAME: W. R Grace & Co., Bartow Works COUNTY: Polk

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peeking Unit No. 2, Gas Fired) Proposed DAP Fertilizer Plant No. 3 stack

SOURCE LOCATION: Street N. of S. R. 60 City W of Bartow

UTM: East 409.290 North 3,086,870

Latitude 27 ° 54 ' 13 "N Longitude 81 ° 55 ' 17 "W

APPLICANT NAME AND TITLE: J. R. Terry, Vice President

APPLICANT ADDRESS: P. O. Box 471, Bartow, FL 33830

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of W. R. Grace & Co., Bartow Works

I certify that the statements made in this application for a construction permit are true, correct and complete to the best of my knowledge and belief. Further, I agree to maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provision of Chapter 403, Florida Statutes, and all the rules and regulations of the department and revisions thereof. I also understand that a permit, if granted by the department, will be non-transferable and I will promptly notify the department upon sale or legal transfer of the permitted establishment.

*Attach letter of authorization

Signed: J. R. Terry

J. R. Terry, Vice President
Name and Title (Please Type)

Date: _____ Telephone No. (813) 533-2171

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed: D. M. Weatherly

D. M. Weatherly
Name (Please Type)

(Affix Seal)

The D. M. Weatherly Co.
Company Name (Please Type)

1800 Peachtree Rd., N.W., Atlanta, GA
Mailing Address (Please Type)

Florida Registration No. 5513 Date: _____ Telephone No. (404) 355-5323

[1]See Section 17-2.02(15) and (22), Florida Administrative Code, (F.A.C.)

SECTION II: GENERAL PROJECT INFORMATION

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

The Fertilizer Plant scrubbing system consists of three venturi scrubbers in parallel using phosphoric acid to remove particulates and ammonia, followed by two vertical packed counter flow tail gas scrubbers: one for dryer gases and one for the remaining fumes. Emissions will comply with DER Rules & Regulations for Particulates and Fluorides.

B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction January 1981 Completion of Construction December 1981

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

Steel tanks & scrubbers	950,000)	
Ductwork, piping, pumps, blower	750,000)	
Electrical & Instrumentation	400,000)	Total $2,300,000
Engineering & Starting	200,000)	

D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

None

E. Is this application associated with or part of a Development of Regional Impact (DRI) pursuant to Chapter 380, Florida Statutes, and Chapter 22F-2, Florida Administrative Code? ____ Yes X No

F. Normal equipment operating time: hrs/day 20-24 ; days/wk 7 ; wks/yr 48-50 ; ~~if power~~ plant, hrs/yr 7600 ;

if seasonal, describe: _____

G. If this is a new source or major modification, answer the following questions. (Yes or No)

1. Is this source in a non-attainment area for a particular pollutant? No
   a. If yes, has "offset" been applied? _____
   b. If yes, has "Lowest Achievable Emission Rate" been applied? _____
   c. If yes, list non-attainment pollutants. _____
2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. Yes
3. Does the State "Prevention of Significant Deterioriation" (PSD) requirements apply to this source? If yes, see Sections VI and VII. No
4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? Yes, to F only
5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? No

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.

REVISION 1, 12/11/79

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable:

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		
*Phosphoric Acid	Fluorides	1.8-3.8%	78,000 P2O5 (dry basis)	sketch No. 1
Ammonia, 100%	-	N.A.	38,000	"
Sulfuric Acid 100%	-	N.A.	2,500	"
Inert filler	-	-	as required	
*as 100% P_2O_5				

B. Process Rate, if applicable: (See Section V, Item 1) 390TPH

1. Total Process Input Rate (lbs/hr): 78,000 of 100% P_2O_5, see above

2. Product Weight (lbs/hr): 160,000 of diammonium phosphate (18-46-0) 800TPH

C. Airborne Contaminants Emitted:

Name of Contaminant	Emission[1]		Allowed Emission[2] Rate per Ch. 17-2, F.A.C.	Allowable[3] Emission lbs/hr	Inlet Loading ~~Potential Emission~~[4]		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/hr	T/yr	
Particulates	37	140	44 lbs/hr.@450 tph	44 lbs/hr	800	3,000	)sketch
(average:	34)		recycle rate				)No. 2:
Fluorides	2.3 0.59*LBS/HR	< 9	0.06/lbsF/ton of	2.31 lbs/hr	40	150	)stack
(average:	2.0)		100% P_2O_5 input				

D. Control Devices: (See Section V, Item 4)

Name and Type (Model & Serial No.)	Contaminant	Efficiency %	Range of Particles[5] Size Collected (in microns)	Basis for Efficiency (Sec. V, It[5]
Same "D.M. Weatherly"	DAP parti-	> 96	Not Applicable	Designer's
design as the D.A.P.	culates &			guarantee
plant at USSAG at	Fluorides	> 95	N.A.	confirmed by
Bartow, Florida	or	as required		performance
		to meet DER		test results
		standards		from USSAG

[1]See Section V, Item 2.

[2]Reference applicable emission standards and units (e.g., Section 17-2.05(6) Table II, E. (1), F.A.C. – 0.1 pounds per million BTU heat input)

[3]Calculated from operating rate and applicable standard

[4]Emission, if source operated without control (See Section V, Item 3) (it will be physically impossible to operate this plant without controls)

[5]If Applicable

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
#5 Fuel Oil	1400 lbs.	1800 lbs.	30
or			
Natural gas	25 MMCF	29 MMCF	30

*Units Natural Gas, MMCF/hr; Fuel Oils, barrels/hr; Coal, lbs/hr

Fuel Analysis:

Percent Sulfur: 2.3 Percent Ash: 0.04

Density: 7.7 lbs/gal Typical Percent Nitrogen: -

Heat Capacity: 18,500 BTU/lb 142,000 BTU/gal

Other Fuel Contaminants (which may cause air pollution): -

F. If applicable, indicate the percent of fuel used for space heating. Annual Average - Maximum -

G. Indicate liquid or solid wastes generated and method of disposal.

None. Process "Pond" Water used in scrubbers is combined with contaminated waters from other plants of the chemical complex and recirculated thru cooling ponds. The system operates without discharge.

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: 132.5 ft. Stack Diameter: 7' 0" ft.

Gas Flow Rate: 160,000 ACFM Gas Exit Temperature: 110-120° °F.

Water Vapor Content: saturated, 10 % Velocity: approx. 70 FPS

SECTION IV: INCINERATOR INFORMATION

NOT APPLICABLE

Type of Waste	Type 0 (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	Type V (Liq & Gas By-prod.)	Type VI (Solid By-prod.)
Lbs/hr Incinerated							

Description of Waste

Total Weight Incinerated (lbs/hr) Design Capacity (lbs/hr)

Approximate Number of Hours of Operation per day days/week

Manufacturer

Date Constructed Model No.

NOT APPLICABLE

	Volume $(ft)^3$	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber					
Secondary Chamber					

Stack Height: _____ ft. Stack Diameter _____ Stack Temp. _____

Gas Flow Rate: _____ ACFM _____ DSCFM* Velocity _____ FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device: [ ] Cyclone [ ] Wet Scrubber [ ] Afterburner [ ] Other (specify) _____

Brief description of operating characteristics of control devices: _____

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

SECTION V: SUPPLEMENTAL REQUIREMENTS

Please provide the following supplements where required for this application.

1. Total process input rate and product weight — show derivation.
2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.,) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.
3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).
4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, etc.).
5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3, and 5 should be consistent: actual emissions = potential (1-efficiency).
6. An 8½" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.
7. An 8½" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).
8. An 8½" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

9. An application fee of $20, unless exempted by Section 17-4.05(3), F.A.C. The check should be made payable to the Department of Environmental Regulation.

10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?
[X] Yes [ ] No

Contaminant	Rate or Concentration
Fluorides	0.06 lbs./ton P_2O_5 input

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy) [ ] Yes [ ] No

Contaminant	Rate or Concentration

C. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration
Fluorides	0.06 lbs./ton P_2O_5 input
DAP Particulates	$\leq$ 34 lbs./hr. or $\leq$ 130 TPY AVG

D. Describe the existing control and treatment technology (if any).

1. Control Device/System: 3 venturi cyclonic scrubbers followed by two counter flow packed towers.
2. Operating Principles: Acceleration, absorption, deceleration, inertial impact.
3. Efficiency:* N.A.
4. Capital Costs: $2,300,000
5. Useful Life: 10 yrs. (packing: 3 yrs.)
6. Operating Costs: $130,000
7. Energy: 1,500 KWH
8. Maintenance Cost: $100,000
9. Emissions: (2.5 #F/hr.) - $<$ 34 #Particulates/hr.

Contaminant	Rate or Concentration
Fluorides: inlets not known; outlets have varied from 1.5 to 3.7 lbs./hr.	
Particulates: inlets not known; outlets have varied up to 34 lbs./hr.	

*Explain method of determining D 3 above.

REV. 12-14-79

10. Stack Parameters

a.	Height:	132.5	ft.	b.	Diameter:	7.0 (8.5 - 10% H2O SAT)	ft.
c.	Flow Rate:	160,000	ACFM	d.	Temperature:	110-120°	°F
e.	Velocity:	70	FPS				

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary).

1. All existing scrubbing systems use the same principles & technology.

a. Control Device: Vertical counter flow packed towers seem more efficient than cross-flow packed scrubbers.

b. Operating Principles:

c. Efficiency*:

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy*:

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

2.

a. Control Device:

b. Operating Principles:

c. Efficiency*:

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy**:

h. Maintenance Costs:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

*Explain method of determining efficiency.

**Energy to be reported in units of electrical power – KWH design rate.

3.

a. Control Device:

b. Operating Principles:

c. Efficiency*:

d. Capital Cost:

e. Life:

f. Operating Cost:

g. Energy:

h. Maintenance Cost:

*Explain method of determining efficiency above.

l. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space and operate within proposed levels:

4.

a. Control Device

b. Operating Principles:

c. Efficiency*:

d. Capital Cost:

e. Life:

f. Operating Cost:

g. Energy:

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected:

1. Control Device:

2. Efficiency*: F ≥ 95%; particul ≥ 96%

3. Capital Cost: 2,300,000

4. Life: 11 yrs.

5. Operating Cost: 130,000

6. Energy: KWH

7. Maintenance Cost: 100,000

8. Manufacturer: "Weatherly" design made in any local shop.

9. Other locations where employed on similar processes:

a.

(1) Company: USS Agri-Chemicals Division (USSAG) of U. S. Steel Corp.

(2) Mailing Address: Hwy. 60 W. Bartow

(3) City: Bartow (4) State: Florida, FL-33830

(5) Environmental Manager: James Carroll

(6) Telephone No.: (813) 533-0471

*Explain method of determining efficiency above.

(7) Emissions*:

Contaminant	Rate or Concentration	
	Design	Performance Test
Fluorides	0.06#/ton P_2O_5	< 0.03 #F/Ton
Particulates (D.A.P.)	33.7 lbs./hr.	< 10 lbs./hr.

(8) Process Rate*: 1300--1600 TPD at the time of the Performance Acceptance Tests, in Jan. 1976

b.

(1) Company:

(2) Mailing Address: see above

(3) City: (4) State:

*Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

REV. 12-14-79

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions*:

Contaminant	Rate or Concentration

(8) Process Rate*: see p.3, sect. III : 80TPH of DAP @ 46% P_2O_5 PROPOSED; 1300-1600 TPD -H- DURING PLANT ACCEPTANCE TEST OF THE BACT SELECTED PLANT, USSAG.

10. Reason for selection and description of systems:

Stack emissions from the D.A.P. fertilizer plant scrubbing system designed by "D. M. WEATHERLY" Engineering Company represent the lowest emissions known to the phosphate industry engineers at this time.

*Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII – PREVENTION OF SIGNIFICANT DETERIORATION

Not required: Particulate Emissions < 50 TPY

A. Company Monitored Data

1. _____ no sites _____ TSP _____ ( ) SO^2* _____ Wind spd/dir

Period of monitoring ____/____/____ to ____/____/____
month day year month day year

Other data recorded _____

Attach all data or statistical summaries to this application.

2. Instrumentation, Field and Laboratory

a) Was instrumentation EPA referenced or its equivalent? _____ Yes _____ No

b) Was instrumentation calibrated in accordance with Department procedures? _____ Yes _____ No _____ Unknown

B. Meteorological Data Used for Air Quality Modeling

1. _____ Year(s) of data from ____/____/____ to ____/____/____
month day year month day year

2. Surface data obtained from (location) _____

3. Upper air (mixing height) data obtained from (location) _____

4. Stability wind rose (STAR) data obtained from (location) _____

C. Computer Models Used

1. _____ Modified? If yes, attach description.

2. _____ Modified? If yes, attach description.

3. _____ Modified? If yes, attach description.

4. _____ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate
TSP	_____ grams/sec
SO^2	_____ grams/sec

E. Emission Data Used in Modeling

Attach list of emission sources. Emission data required is source name, description on point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review.

*Specify bubbler (B) or continuous (C).

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.

1-4-76 (SECT. V, 2)

by D.M. WEATHERLY Co.

JOB #193 - U.S. STEEL
PERFORMANCE TEST RESULTS

(1)

			GUAR.		AS [redacted]	
A - PRODUCT - RATE & QUALITY						
1 - RATE -		STPD	1152		1289.73 - 1606.0	
2 - QUALITY						
- AVAIL. N_2		NLT %	18.00		U.S.S. AGREE OK	
- AVAIL. P_2O_5		NLT %	46.00			
- MOIST.		NMT %	1.2			
- SIZING -						
+6 MESH		NMT %	1.0			
-16 MESH		NMT %	1.0		CK'd IN SCR. CLOTH	
B. RECOVERY - RAW MATLS						
1. N_2 FROM NH_3		%	97		99.78 AVG.	
2. P_2O_5 FROM H_3PO_4		%	98		99.77 AVG.	
C - EMISSIONS (65 STPH RATE)						
1. [redacted]		#/HR	33.103		[redacted]	
		#/DAY	808.87		153.40	
		#/TON (P)	0.5185		0.0983	
2. FLUORINE		#/HR	1.794		0.2177 AVG.	
		#/DAY	43.056		5.224	
		#/TON-PROD	0.0276			
		#/TON-P_2O_5	0.060		0.0073	

- 3 grades

0.78×10^{-3} k...

17.6×10^{-3} = $\frac{17 \times 10^{-3}}{10^6}$

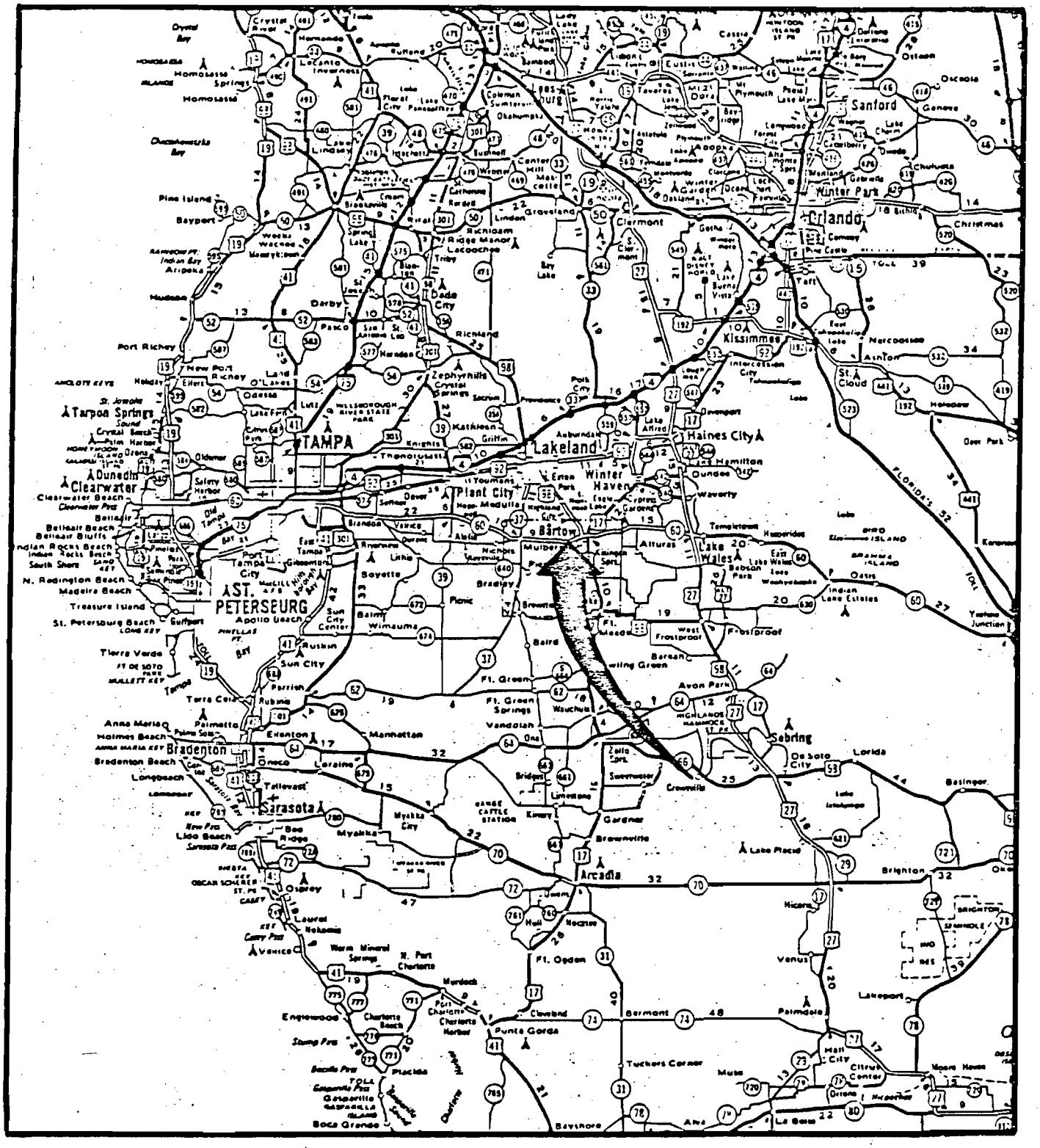


Figure 1. Location of the W. R. Grace Phosphate Fertilizer Complex.

Sect. V, 7.

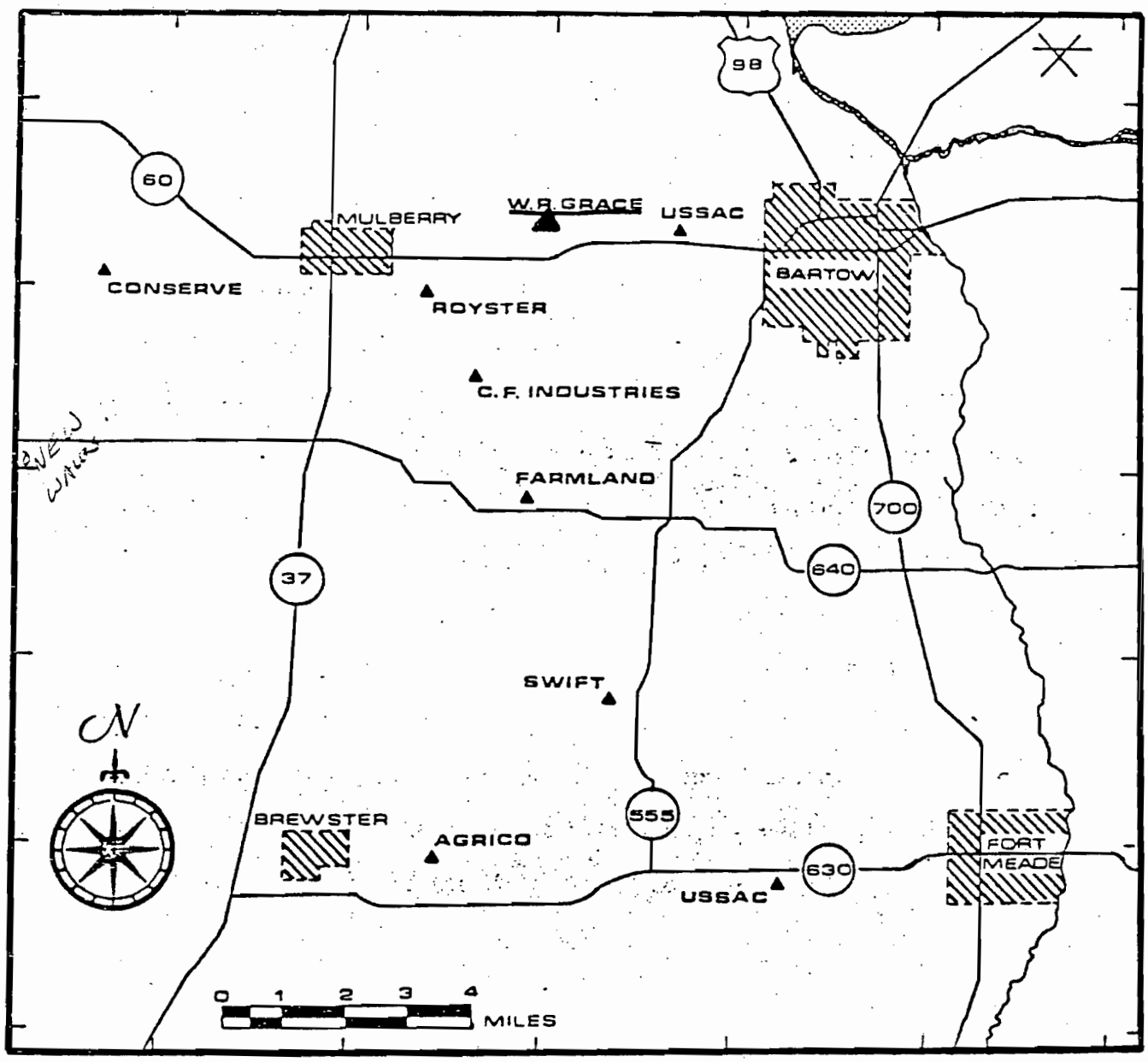


Figure 2. Study Area

Sect. V, 7.

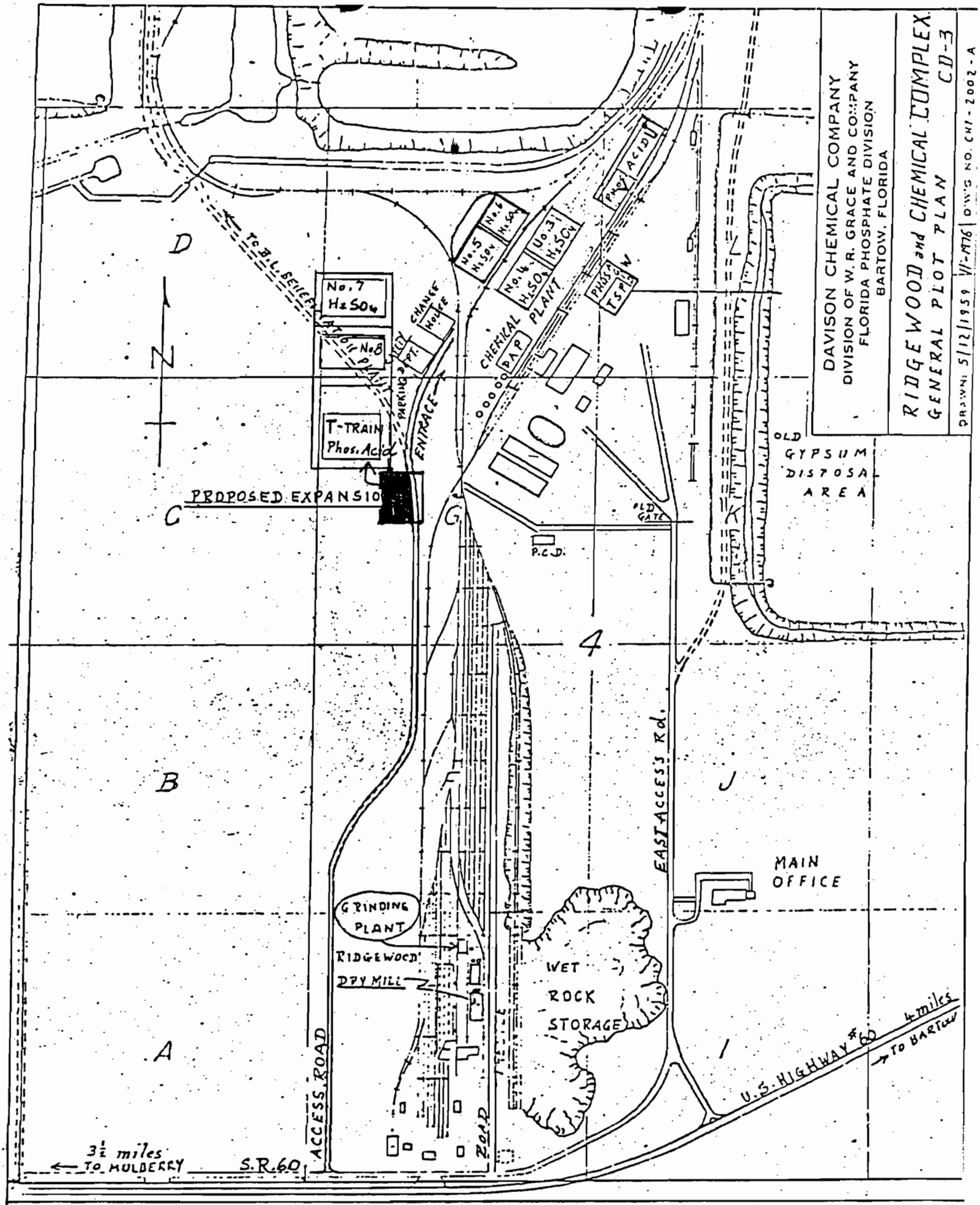
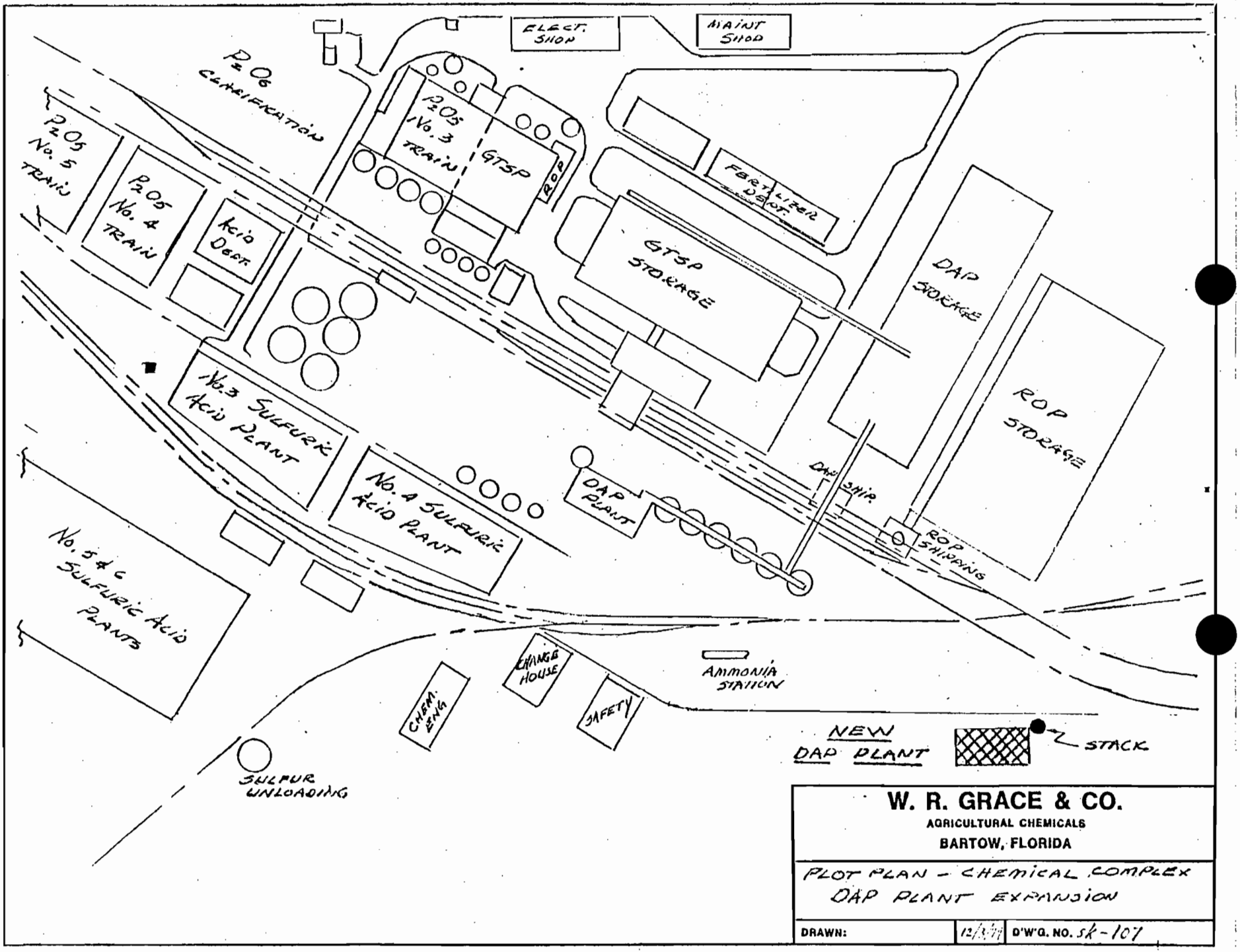

DAVISON CHEMICAL COMPANY
DIVISION OF W. R. GRACE AND COMPANY
FLORIDA PHOSPHATE DIVISION
BARTOW, FLORIDA
RIDGEWOOD and CHEMICAL COMPLEX
GENERAL PLOT PLAN
CD-3
DRAWN: 5/12/1959
DWG NO. CHI-2002-A
No. 7 H2SO4
No. 8
CHANGE HOUSE
PARKING
ENTRANCE
T-TRAIN Phos. Acid
PROPOSED EXPANSION
No. 5 H2SO4
No. 6 H2SO4
No. 4 H2SO4
No. 3 H2SO4
PHOS. ACID
TSP
CHEMICAL PLANT
DAP
OLD GYPSUM DISPOSAL AREA
OLD GATE
P.C.D.
EAST ACCESS Rd.
MAIN OFFICE
GRINDING PLANT
RIDGEWOOD DRY MILL
WET ROCK STORAGE
ACCESS ROAD
U.S. HIGHWAY #60
4 miles TO BARTOW
3½ miles TO MULBERRY
S.R. 60
A
B
C
D
E
F
G
H
I
J
1
2
3
4

Figure 4



W. R. GRACE & CO.
AGRICULTURAL CHEMICALS
BARTOW, FLORIDA

PLOT PLAN - CHEMICAL COMPLEX
DAP PLANT EXPANSION

DRAWN:	12/3/71	D'W'G. NO. SK-107

State of Florida

DEPARTMENT OF STATE • DIVISION OF CORPORATIONS

I certify from the records of this office that W.R. GRACE & CO., is a corporation organized under the laws of the State of Connecticut, authorized to transact business within the State of Florida.

The charter number for this corporation is 804671.

I further certify that said corporation has filed all annual reports and paid all annual report filing fees due this office through December 31, 1978, and its status is active.

GIVEN under my hand and the Great Seal of the State of Florida, at Tallahassee, the Capital, this the 11th day of October, 1978.

SECRETARY OF STATE

CER 101
7-21-78

3.0 SUMMARY

Air quality modeling has shown that the impact of particulate matter and sulfur dioxide emissions from the proposed DAP plant will be significant only during a 24-hour averaging period. Further modeling has shown that during the 24-hour averaging period, the impact of emissions from the proposed source, when combined with emissions from other new sources at the W. R. Grace chemical complex, will not threaten applicable PSD increments. Modeling further shows that the impact of emissions from the proposed DAP plant over a 24-hour period when combined with emissions from all other new and existing sources at the W. R. Grace chemical complex will not threaten ambient air quality standards.

TABLE 2

SUMMARY OF IMPACT
OF PARTICULATE MATTER AND SULFUR DIOXIDE EMISSIONS
FROM PROPOSED DAP PLANT AND OTHER NEW SOURCES

W. R. GRACE AND COMPANY
BARTOW, FLORIDA

Pollutant/ Avg. Time	DAP Plant Impact (ug/m^3)	Total New and Proposed Source Impact (ug/m^3)	Significant Impact[1] (ug/m^3)	Class II PSD Increment (ug/m^3)	Impact of all WRG Sources (ug/m^3)
Particulate Matter					
Annual	0.8	0.8[3]	1	19	(2)
24-Hour	7.6	7.6[3]	5	37	68.1
Sulfur Dioxide					
Annual	0.6	(2)	1	20	(2)
24-Hour	5.6	52.4	5	91	188
3-Hour	13.4	(2)	25	512	(2)

(1) Defined in Chapter 17-2.17 Florida Administrative Code.

(2) Not calculated since proposed source impact is not significant.

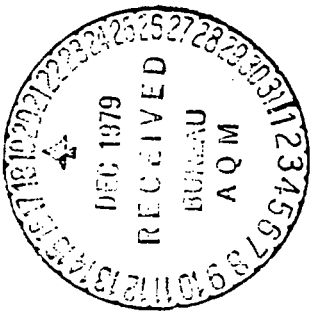
(3) Proposed DAP plant is the only "new" particulate matter source at the W. R. Grace Bartow Chemical Complex.

GRACE

Agricultural Chemicals Group

W. R. Grace & Co.
P.O. Box 471
Bartow, Florida 33830

(813) 533-2171



December 14, 1979

Mr. Stephen Smallwood
Chief of Air Quality Management
Department of Environmental Regulation
2600 Blair Stone Rd.
Tallahassee, FL 32301

RE: CONSTRUCTION PERMIT FOR NO. 3 DAP PLANT

Dear Mr. Smallwood:

In reply to the questions raised in your letter dated November 7, 1979 we are enclosing seventeen pages expanding on the answers to the eight question on page 5, Section V, of the DER application form 17.1.122 (16) as well as replying to the eleven questions raised in your enclosure entitled "Determination of Completeness AC-24460" attached to your letter dated November 7th.

Please note that we are including revised pages 6 thru 9 of the application form covering BACT, even though the maximum possible emissions fall far below the D.E.R. criterium of 250 TPY.

We are also ~~enclosing~~ herewith, ~~Section VII~~: Prevention of Significant Deterioration, p. 10, duly filled out by our consultant Dr. John Koogler, who has made the pertinent Air Quality Modelling calculations.

Please contact the undersigned, or John Koogler, for any additional information you might require.

Sincerely,

W. R. GRACE & CO.
Agricultural Chemicals Group

M. J. Martinasek
Sr. Project Engineer
Air & Water Quality Control

MJM:db

Enclosures

cc: P. David Puchaty, DER (w/e)
Tommie Gibbs EPA (w/e)
F. L. Applegate (w/o encl.)
C. F. Peters (w/e)
M. J. Altenburger (w/o encl.)

Determination of completeness: AC-24460

Information requested:

1. Operation diagram and verbal description of process: see enclosed sketch No. 1 & 2, and the sheet entitled "DAP Manufacturing," enclosed herewith.

2. UTM coordinates for stack location: see p. 1 of 10 of the application form.

3. P_2O_5 input as basis of control calculations for F emissions:

   See the attached revised p. 3 of section III for input P_2O_5 and actual (not hypothetical, or calculated) emissions from the same scrubbing system at USSAG's new DAP plant, the Acceptance Test of which has been witnessed by DER. The same design has been used on the proposed DAP plant as at the said USSAG plant, which has the lowest emissions known to the phosphate industry.

4. Satement of P_2O_5 content of product:

   See the above mentioned p. 3 of Section III:
   18-46-0 DAP. (46% P_2O_5).

5. Efficiency calculations:

   See enclosed detailed reply to p. 5, Section V.

6. See enclosed sheets entitled "Section V: Supplemental Requirements, as well as the enclosed "Performance Test Results" from the USSAG (Steel) plant at Ft. Meade, which has been witnessed by DER and officially submitted to DER by USSAG as part of their application for Operating Permit. Drawings by D. M. Weatherly Co., showing the requested plan and elvations, Nos. 6570-201/203, 248-204, and plot plan 6570-1101.

7. Application for BACT: Section VI of the Permit application permit has been completed.

8. Certification of determination of PSD, Section VII, p. 10 of the Permit Application, has been completed by Dr. John Koogler and is enclosed herewith.

9. The annual operating hours mentioned are not likely to be exceeded.

MJA:db
12/7/79

10. We forsee only DAP product manufactured.

11. SO_2 emission are negligeable as the free ammonia in the dryer fumes neutralizes it. Furthermore, our plant dryers operate on natural gas most of the year. We switch to No. 5 fuel oil only during brief periods of extreme cold waves, when enough natural gas is not available.

    Nevertheless, taking a very conservative approach to calculating maximum SO_2 emission from the 1,260 lbs./hr. of No. 5 Fuel Oil burned occasionally, ~~we expect to emit less than 25 lbs. of SO_2 per operating hour~~, under the most unfavorable conditions.

MJA:db
12/7/79

PROPOSED FERTILIZER PLANT: DAP MANUFACTURING PROCESS

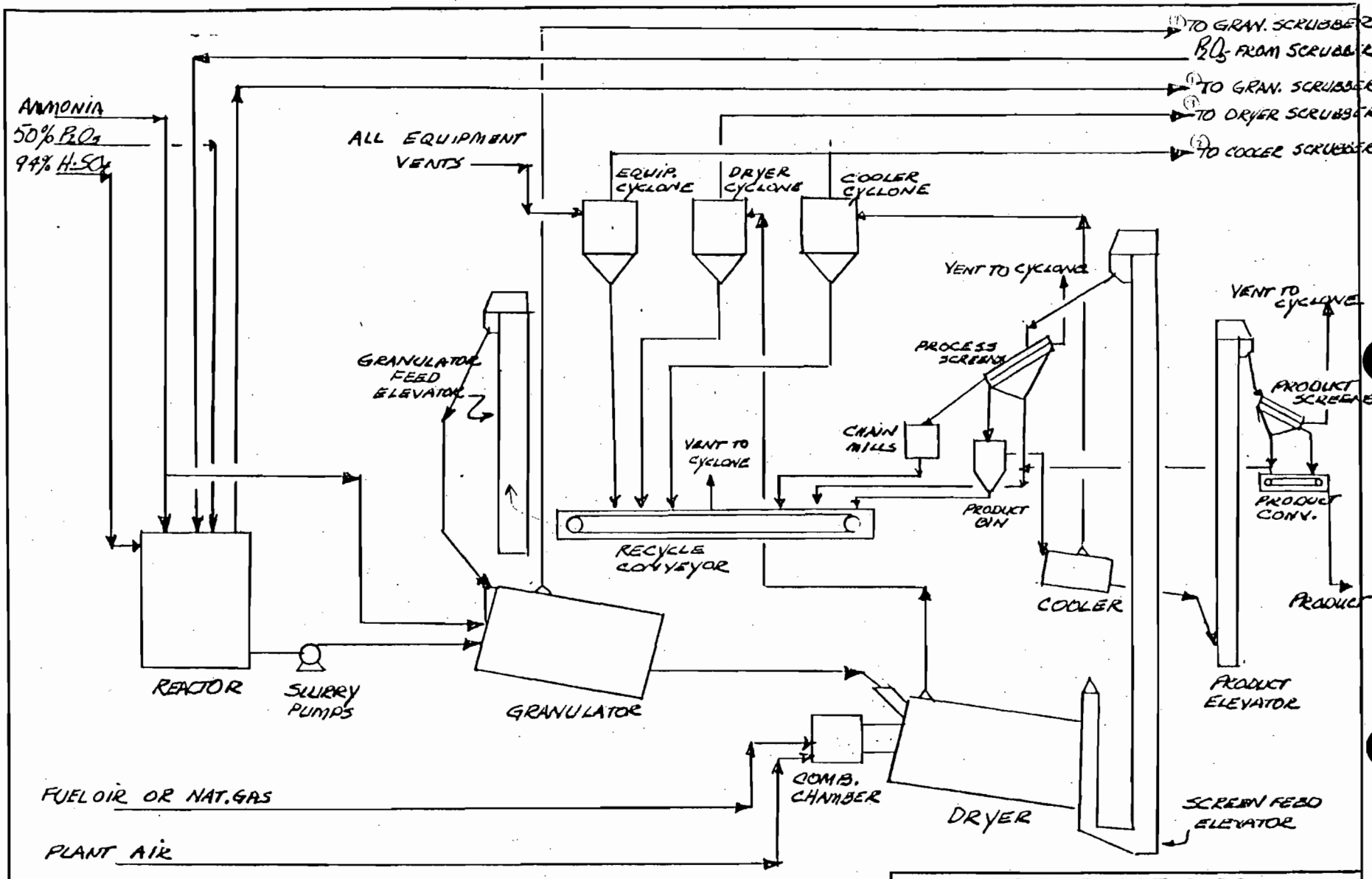
Raw materials for manufacturing 18-46-0 (granulated diammonium phosphate) are liquid anhydrous ammonia, wet process phosphoric acid, and sulfuric acid. The flow of these materials through the plant is indicated on the flow sketches No. 1 and 2.

Phosphoric acid is metered to the plant and is introduced to the scrubber system. The water required to maintain the process balance is fed to the scrubber system and the resulting diluted acid is recirculated through three scrubber systems to recover ammonia and dust losses from the process. Phosphoric acid and scrubber liquor are continuously added to the reactor. Substantial quantities of water are evaporated as a result of the heat of reaction between the ammonia and the acids.

Slurry produced in the reactor is continuously transferred under controlled conditions to a rotary ammoniator. The balance of the anhydrous ammonia required to make DAP is added in the ammoniator. A circulating load of product, ground oversize and fines is fed to the ammoniator to provide the proper ammoniating and granulating conditions. The material that is discharged from the ammoniator passes through a rotary dryer where the moisture content is reduced to approximately 1%.

The dried material is elevated by elevator and fed to the process screens. The product size from the screens discharges into the product bin: A controlled amount of DAP from the product bin is discharged by recycle feeder to the recycle conveyor. The oversize removed by the screens is ground in chain mills and returned to the recycle conveyor system for reprocessing in the ammoniator. Fines removed by the screens also are discharged to the recycle conveyor system for reprocessing in the ammoniator. Overflow from product bin discharges into a rotary cooler and the cooled product is elevated to the product screens where final screening achieves proper product size. The product is discharged onto the product transfer conveyor. The oversize and fines are returned to the recycle conveyor.

Gases from the reactor and from the granulator are scrubbed in the reactor-granulator scrubber using the diluted feed acid to recover ammonia and dust. Air from the dryer, cooler, and other equipment is passed through dry cyclonic dust collectors where dust is separated from the air streams and returned to recycle. The air discharged from the cyclones then passes through the cooler equipment and dryer scrubbers for final dust removal. The effluents from the acid scrubbers are then passed through the tail gas scrubbers for final scrubbing and discharged by the tail gas scrubber blowers into a common stack.

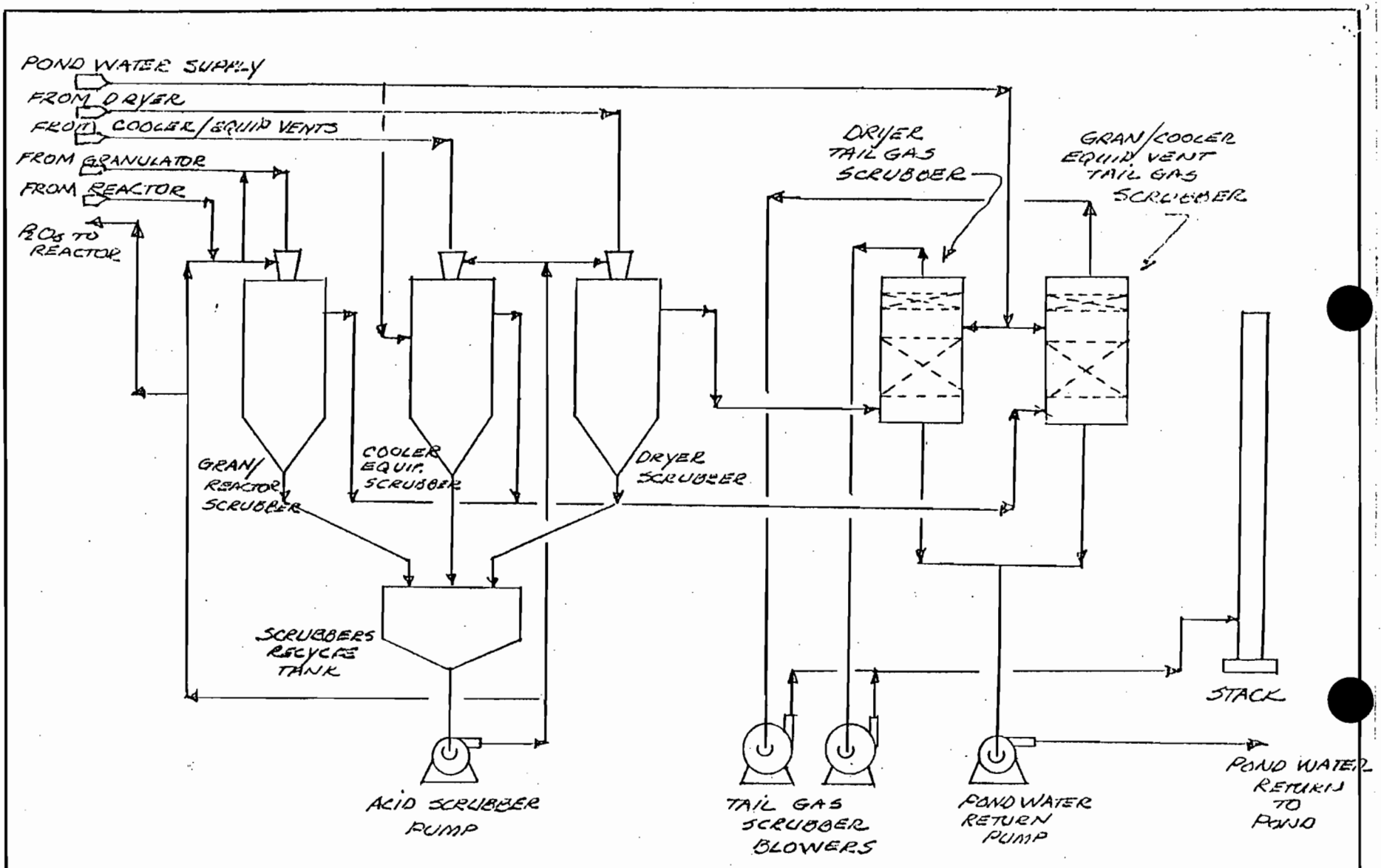


W. R. GRACE & CO.
AGRICULTURAL CHEMICALS
BARTOW, FLORIDA

DAP GRANULATION PLANT
PROCESS FLOW DIAGRAM - PROCESS

DRAWN: H. CORTES | 12/79 | D'W'G. NO. 1

Sect. V, 6.



W. R. GRACE & CO.
AGRICULTURAL CHEMICALS
BARTOW, FLORIDA

DAP GRANULATION PLANT
PROCESS FLOW DIAGRAM
SCRUBBER SYSTEM

DRAWN: H. CORTES | D'W'G. NO. 2

Originated By	THE D. M. WEATHERLY COMPANY ENGINEERS AND BUILDERS ATLANTA, GEORGIA	Specification Section	Date
JWJ		Sec. V, 4.	7-13-79
Approved By			Revision Number P
Job Number	Specifications For	Identifying Number	
6570	COOLER-EQUIPMENT SCRUBBER	117	

FUNCTION: To scrub particulates from cooler and equipment exhaust gases.

OPERATION: Continuous

DESIGN CRITERIA: One (1) coaxial venturi scrubber using weak phosphoric acid to scrub particulates from the gases.
Inlet Volume of Gas: 79,622.5 ACFM
Temperature of Gas: 136° F.
Design Pressure: 28" H_2O Vacuum (max.)
Dimensions: 13' 1/2" OD x 50' 9" overall

MATERIAL OF CONSTRUCTION: Type 316L stainless steel

Originated By	THE D. M. WEATHERLY COMPANY	Specification Section	Date
JWJ	ENGINEERS AND BUILDERS	Sec. V, 4.	7-13-79
Approved By	ATLANTA, GEORGIA		Revision Number P
Job Number	Specifications For	Identifying Number	
6570	Reactor-Granulator Scrubber	118	

FUNCTION: To scrub out ammonia and particulates from reactor and granulator exhaust gases.

OPERATION: Continuous

DESIGN CRITERIA: One (1) coaxial venturi scrubber using weak phosphoric acid to scrub ammonia and particulates from the gases.
Inlet Volume of Gas: 34,546.4 ACFM
Temperature of Gas: 183° F.
Design Pressure: 28" H_2O vacuum (max.)
Dimensions: 8' 1/2" x 29' 4" overall

MATERIALS OF CONSTRUCTION: Type 316L Stainless Steel

Originated By	THE D. M. WEATHERLY COMPANY	Specification Section	Date
JWJ	ENGINEERS AND BUILDERS	Sec. I, 4.	7-13-79
Approved By	ATLANTA, GEORGIA		Revision Number P
Job Number	Specifications For	Identifying Number	
6570	DRYER SCRUBBER	125	

FUNCTION: To scrub particulates from dryer exhaust gases.

OPERATION: Continuous

DESIGN CRITERIA: One (1) coaxial venturi scrubber using weak phosphoric acid to scrub particulates from dryer exhaust gases.
Inlet Volume of Gas: 70,714.5 ACFM
Temperature of Gas: 190° F.
Design Pressure: 28" H_2O vacuum (max.)
Dimensions: 11' 1/2" OD x 44' 9" overall

MATERIALS OF CONSTRUCTION: Type 316L Stainless Steel

Originated By	THE D. M. WEATHERLY COMPANY ENGINEERS AND BUILDERS ATLANTA, GEORGIA	Specification Section	Date
BRP		Sec. V, 4.	7-13-79
Approved By			Revision Number P
Job Number	Specifications For	Identifying Number	
6570	Dryer Tail Gas Scrubber	147	

FUNCTION: To further remove particulates and fluorines from plant exhaust gases.

OPERATION: Continuous

MATERIALS HANDLED: Traces of fluorine, particulates, ammonia, phosphoric acid, and pond water.

DESIGN CRITERIA: Vertical packed tower with countercurrent flow.
Dimensions: 12' 1/2" OD x 33' 11" overall
Gas Volume: 68,653.5 ACFM
Design Temperature: 180° F.
Design Pressure: 28" H_2O vacuum (max.)

MATERIALS OF CONSTRUCTION: Shell to be rubber lined steel. Tower internals, i.e., support plate, liquid distributor, bed limiter, etc., to be 316L SS. Bed to be packed with 3" polypropylene Intalox saddles.

FORM 3009 2-66

Originated By	THE D. M. WEATHERLY COMPANY ENGINEERS AND BUILDERS ATLANTA, GEORGIA	Specification Section	Date
BRP		Sec. V, 4	7-13-79
Approved By			Revision Number P
Job Number	Specifications For	Identifying Number	
6570	Reactor-Granulator-Cooler-Equipment Tail Gas Scrubber	148	

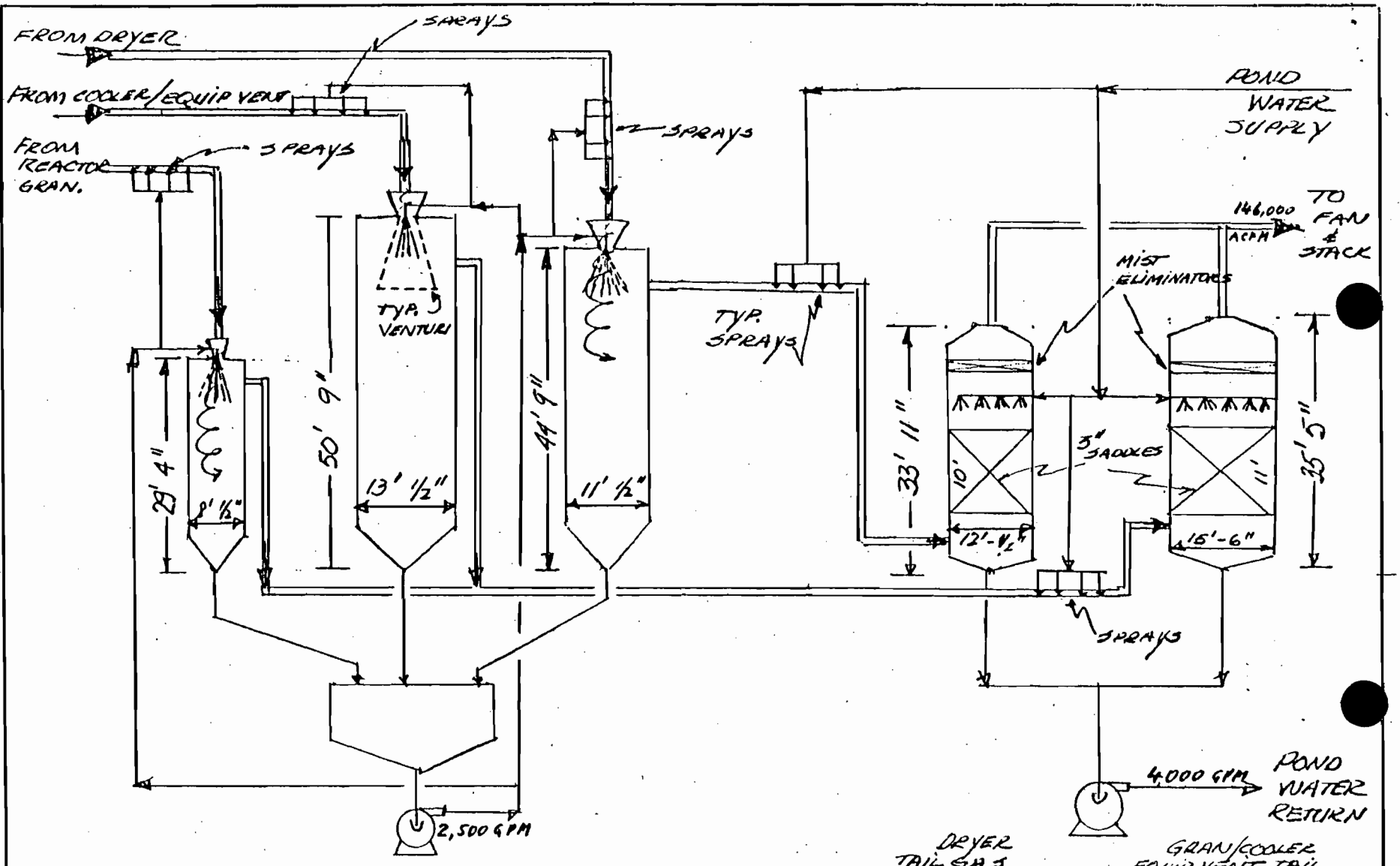
FUNCTION: To further remove fluorine and particulates from plant exhaust gases.

OPERATION: Continuous

MATERIALS HANDLED: Traces of fluorine, particulates, phosphoric acid, ammonia, and pond water.

DESIGN CRITERIA: Vertical packed tower with countercurrent flow.
Dimensions: 15' 6 3/4" OD x 35' 5" overall
Gas Volume: 116,200.6 ACFM
Design Temperature: 180° F.
Design Pressure: 28" H_2O vacuum (max.)

MATERIALS OF CONSTRUCTION: Shell to be rubber lined steel. Tower internals, i.e., support plate, liquid distributor, bed limiter, etc., to be 316L SS. Bed to be packed with 3" polypropylene Intalox saddles.



SCALE: 1" = 20'

W. R. GRACE & CO.
AGRICULTURAL CHEMICALS
BARTOW, FLORIDA

DAP GRANULATION PLANT
PROCESS FLOW DIAGRAM
SCRUBBER SYSTEM

DRAWN: H CORTES | 12/79 | D'W'G. NO. 3

Sect. V., 4.

Page 5, Section V: Supplemental Requirements

1. The process rate input and product rate: see enclosed revised p. 3, Section III, paragraphs A and B. These rates were derived statistically from our actual usage average for 1978. Please note that we express phosphoric acid in terms of 100% P_2O_5.

2. Basis of emission estimate: D. M. Weatherly Co., who designed the proposed scrubbing system, has also designed the D.A.P. plant scrubbing system at USSAG Ft. Meade plant. Actual stack test data witnessed by D.E.R. were used by Weatherly to project our proposed emissions from the virtually indentically designed system.

3. Basis for "potential discharge: The proposed fertilizer plant cannot be physically operated without the scrubbing system: a) The dryer fan cannot be turned on unless the scrubber pumps are in operation, b) there is no duct bypassing the scrubber. Therefore the "potential discharge of particulates is the same as the maximum emission of 37 lbs./hr. or 140 TPY indicated on p. 3, paragraph C. Please note that E.P.A. intends to comply with U. S. District Court Ruling that the inlet to the scrubber may not be assumed to equal potential discharge when the scrubber cannot be bypassed. We suggest therefore that "inlet" data from paragraph 6. be substituted for "potential discharge."

4. Design detail for all air pollution control systems: Enclosed herewith is one specification sheet for each scrubber, and two sketches depicting cross sections of the proposed cyclonic and packed scrubbers, as well as sketch No. 2 & 3 depicting the general arrangement.

5. Efficiency calculations were made as follows:

   Inlet x efficiency = stack discharge, where
   Inlet : up to 900 lbs./hr., approx.
   Efficiency: approx. 96% plus
   Stack discharge, max. = 37 lbs./hr.

6. Plant flowsheet

   See enclosed sketch No. 1

7. Location plot plans of the Chemical Complex:

   See enclosed maps, fig. 1 & 2.

8. Plot Plan showing the location of the proposed fertilizer (DAP) plant and its only stack:

   See enclosed sketch No. 107.