Check Sheet

Company Name: Agrico Chemical Company
Permit Number: AC 29-5954
PSD Number:
County:
Permit Engineer: Edtteral Hack
Others involved:

Application:
- [x] Initial Application
- [x] Incompleteness Letters
- [x] Responses
- [x] Final Application (if applicable)
- [x] Waiver of Department Action
- [x] Department Response

Intent:
- [x] Intent to Issue
- [x] Notice to Public
- [x] Technical Evaluation
- [ ] BACT Determination
- [x] Unsigned Permit

Attachments:
- [ ]
- [ ]
- [ ]

- [ ] Correspondence with:
  - [ ] EPA
  - [ ] Park Services
  - [ ] County
  - [ ] Other
- [x] Proof of Publication
- [x] Petitions - (Related to extensions, hearings, etc.)

Final Determination:
- [x] Final Determination
- [x] Signed Permit
- [ ] BACT Determination

Post Permit Correspondence:
- [x] Extensions
- [ ] Amendments/Modifications
- [x] Response from EPA
- [ ] Response from County
- [ ] Response from Park Services

keep the original documents.
Image the copies in the Final Permit?
yes NO

This permit was originally issued February 1982.
A renewal of this permit was issued October 1985
Therefore there are two of every part of the file.

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
Permit(s) numbered: AC 29-5954

Documents: Period During Which DOCUMENT WAS SUBMITTED (APPLICATION, PD & TE, FINAL DETERMINATION, POST PERMIT)	Detailed Description
2nd App.	1. LARGE XEROX OF BLUE PRINTS "SECTION - STORAGE BLDG" ED-202 ORDER NO. 28-7443 2. BLUE PRINT "SECTION - STORAGE BLDG" GD-202 ORDER NO. 28 7441 3. AREA PLAN - SULFER STORAGE GD-201 4. EAST ELEVATION GD-203 5. AERIAL PLOT PLAN CD-202

Agrico
ONE OF THE WILLIAMS COMPANIES

DER
MAY 2 1986
BAQM

April 28, 1986

Mr. C.H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality Management
Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32301-8241

Re: Permit No. AC 29-5954, Solid Sulfur Handling and Storage Facility, Specific Conditions 8(a) and (b)

Dear Mr. Fancy:

I have reviewed the department's recommended locations for the nipher gauges and hi vols. I have made some comments on the enclosed plot plan.

The main problem with hi vols is lack of power, due to remote locations.

Very truly yours,

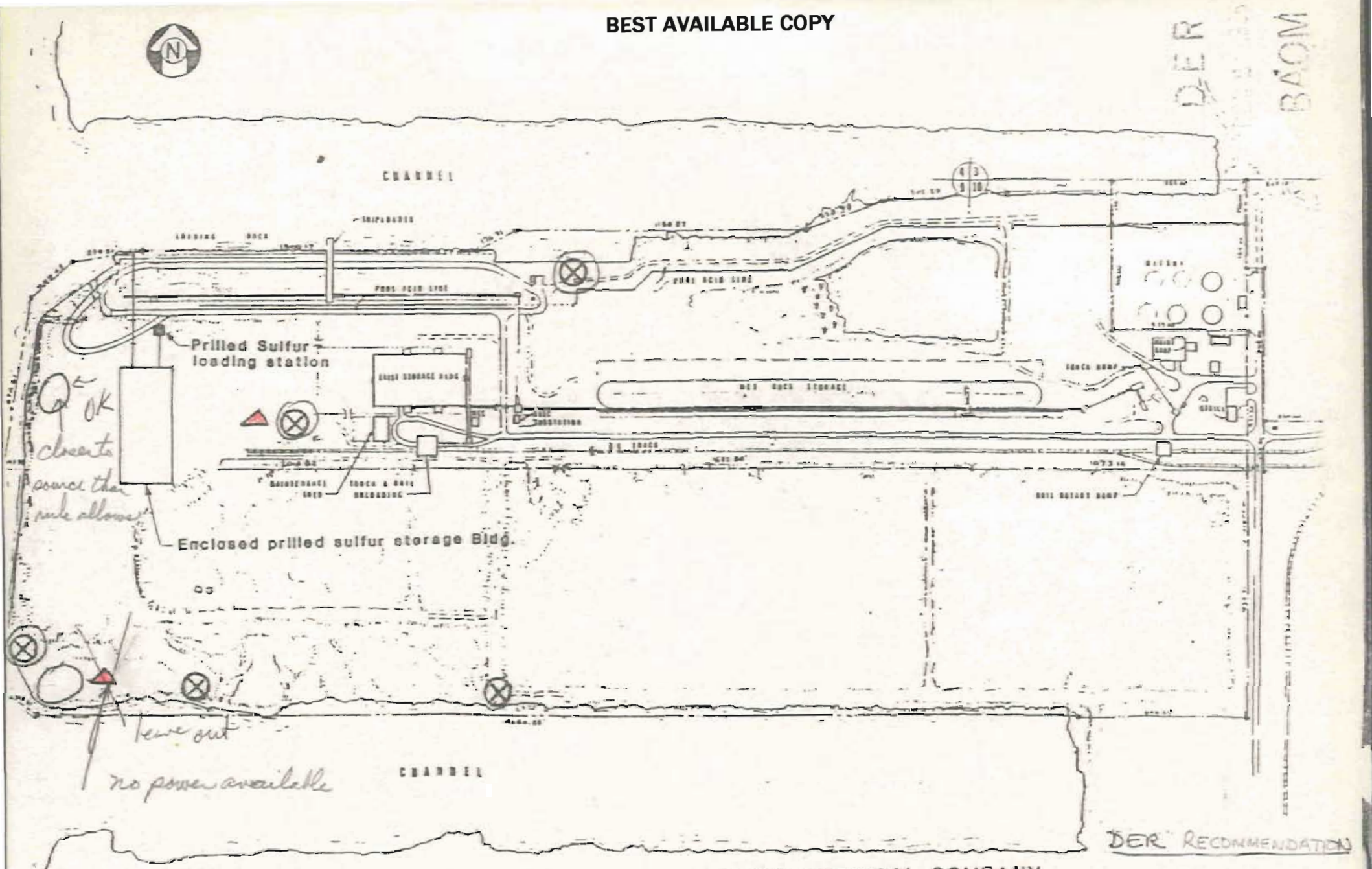
H.W. Long

H.W. Long, Jr.
Manager
Environmental Control

HWL:crl
enclosure

Agrico Chemical Company—Florida Mining Operation • P. O. Box 1110 • Mulberry, Florida 33860
813/428-1431

BEST AVAILABLE COPY



DER RECOMMENDATION

NIPHER GAUGE LOCATION

HI-VOL LOCATION

⊗ LOCATION OF MODIFIED NIPHER GAUGE

AGRICO CHEMICAL COMPANY
BIG BEND TERMINAL

RE: SPECIFIC CONDITION 8(a)
PERMIT No. AC29-5954

PRIDGEN ENGINEERING COMPANY
LAKELAND, FLORIDA
DIVISION OF JACOBS ENGINEERING COMPANY

ATTACHMENT 18

JACOBS ENGINEERING GROUP, INC

Agrico 28-7443
October 2, 1984

EMISSION RATES

	2% Moisture Activity	TPH	Emission Factor E	Bldg Factor	Emission Rate lb/hr — Per Cent Control 0	50.000	85.000	Hrs/Yr	Emission Rate TPY — Per Cent Control 0	50.00	85.00
	Ship to Storage										
del	Clamshell to Hold	672.00	0	1.00	0	0	0	1000.00	0	0	0
B ✓	Clamshell to Hopper	672.00	0.0005579	1.00	0.375	0.187	0.056	1000.00	0.19	0.09	0.03
C ✓	Hopper to Belt	672.00	0.0017819	1.00	1.197	0.599	0.180	1000.00	0.60	0.30	0.09
C ✓	Belt Transfer	672.00	0.0035637	1.00	2.395	1.197	0.359	1000.00	1.20	0.60	0.18
C ✓	To Storage Pile	672.00	0.0089093	0.03	0.180	0.180	0.180	1000.00	0.09	0.09	0.09
	Pile Activity										
del	Pile Erosion		0	0.03	0	0	0	8000.00	0	0	0
del	Payloader Pickup	84.00	0	0.03	0	0	0	8000.00	0	0	0
B ✓	Payloader Dump	84.00	0.0006533	0.03	0.002	0.002	0.002	8000.00	0.01	0.01	0.01
C ✓	Vehicle Traffic	84.00	0.0909427	0.03	0.229	0.229	0.229	8000.00	0.92	0.92	0.92
	Truck Loadout										
C ✓	Belt Transfer	84.00	0.0049547	1.00	0.416	0.208	0.062	8000.00	1.66	0.83	0.25
C ✓	Bin Dump	84.00	0.0070792	1.00	0.595	0.297	0.089	8000.00	2.38	1.19	0.36
C ✓	Bin to Truck	84.00	0.0070782	1.00	0.595	0.297	0.089	8000.00	2.38	1.19	0.36
					5.983	3.197	1.246	TOTALS	9.42	5.32	2.27

3% Moisture Activity	TPH	Emission Factor E	Bldg Factor	Emission Rate lb/hr — Per Cent Control 0	50.000	85.000	Hrs/Yr	Emission Rate TPY — Per Cent Control 0	50.00	85.00
Ship to Storage										
Clamshell to Hold	672.00	0	1.00	0	0	0	1000.00	0	0	0
Clamshell to Hopper	672.00	0.0002479	1.00	0.167	0.083	0.025	1000.00	0.08	0.04	0.01
Hopper to Belt	672.00	0.0008856	1.00	0.592	0.291	0.087	1000.00	0.29	0.15	0.04
Belt Transfer	672.00	0.0017311	1.00	1.163	0.582	0.174	1000.00	0.58	0.29	0.09
To Storage Pile	672.00	0.0043278	0.03	0.087	0.087	0.087	1000.00	0.04	0.04	0.04
Pile Activity										
Pile Erosion		0	0.03	0	0	0	8000.00	0	0	0
Payloader Pickup	84.00	0	0.03	0	0	0	8000.00	0	0	0
Payloader Dump	84.00	0.0002903	0.03	0.001	0.001	0.001	8000.00	0.00	0.00	0.00
Vehicle Traffic	84.00	0.0909427	0.03	0.229	0.229	0.229	8000.00	0.92	0.92	0.92
Truck Loadout										
Belt Transfer	84.00	0.0024068	1.00	0.202	0.101	0.030	8000.00	0.81	0.40	0.12
Bin Dump	84.00	0.0034384	1.00	0.289	0.144	0.043	8000.00	1.15	0.58	0.17
Bin to Truck	84.00	0.0034384	1.00	0.289	0.144	0.043	8000.00	1.15	0.58	0.17
				3.039	1.663	0.721	TOTALS	5.04	3.00	1.57

JACOBS ENGINEERING GROUP, INC

Agrico 28-7443
October 2, 1984

EMISSION FACTORS

Batch Drop Operations — AP 42

$E = 0.0018k[(s/5)(U/5)(H/5)]/[(M/2)^2(Y/6)^{.33}]$

	k	s	U	H	M	Y	E
Clamsh.-Hopper Pt 1	1.00	5.00	2.00	5.00	2.00	13.00	0.0005579
Clamsh.-Hopper Pt 1	1.00	5.00	2.00	5.00	3.00	13.00	0.0002479
Payloader- Belt Pt 5	1.00	5.00	2.00	6.00	2.00	14.00	0.0006533
Payloader- Belt Pt 5	1.00	5.00	2.00	6.00	3.00	14.00	0.0002903

Continuous Operations — Lundgren Equation

$E = kS[1+(u/10)^2](h/5)Fs/[((M+.3)/4)^2(Y/.33)^{.33}]$

	k	S	u	h	M	Y	Fs	E
Hopper to Belt Pt 2	1.00	1.00	2.00	5.00	2.00	672.00	0.0070	0.0017819
Belt Transfer Pt 3	1.00	1.00	2.00	10.00	2.00	672.00	0.0070	0.0035637
to Storage Pile Pt 4	1.00	1.00	2.00	25.00	2.00	672.00	0.0070	0.0089093
Belt Transfer Pt 6	1.00	1.00	2.00	7.00	2.00	84.00	0.0070	0.0049547
Bin Dump Pt 8	1.00	1.00	2.00	10.00	2.00	84.00	0.0070	0.0070792
Bin to Truck Pt 9	1.00	1.00	2.00	10.00	2.00	84.00	0.0070	0.0070782
Hopper to Belt Pt 2	1.00	1.00	2.00	5.00	3.00	672.00	0.0070	0.0008656
Belt Transfer Pt 3	1.00	1.00	2.00	10.00	3.00	672.00	0.0070	0.0017311
to Storage Pile Pt 4	1.00	1.00	2.00	25.00	3.00	672.00	0.0070	0.0043278
Belt Transfer Pt 6	1.00	1.00	2.00	7.00	3.00	84.00	0.0070	0.0024068
Bin Dump Pt 8	1.00	1.00	2.00	10.00	3.00	84.00	0.0070	0.0034384
Bin to Truck Pt 9	1.00	1.00	2.00	10.00	3.00	84.00	0.0070	0.0034384

Vehicular Traffic — AP 42

$lb/VMT = 0.090k[(4/n)(s/10)^{0.7}(L/1000)(W/3)^{0.7}]$

	k	I	n	s	L	W	lb/VMT	E
Payloader Oper. Pt 5	1.00	1.00	2.00	8.00	23000.00	42.00	21.0078	0.0909427

with: 240 ft/round trip
8 trips/hr
84 TPH

then: $E = (8)(240)/((5280)(84))$ x lb/VMT

Agrico
ONE OF THE WILLIAMS COMPANIES

February 26, 1986

DER

FEB 28 1986

BAQM

Mr. C.H. Fancy, P.E.
Deputy Chief, B.A.Q.M.
Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32301-8241

Re: Permit No. AC29-5954

Dear Mr. Fancy:

The following information is supplied in reply to questions asked in your letter of February 19, 1986. Replies are given in the order of questions asked.

(a) The objective of this monitoring plan is to satisfy requirements of Specific Condition #8 of the subject permit and Chapter 17-2.753 for monitoring the deposition of sulfur particulate.

(b) The sites were chosen to meet the requirements of Chapter 17-2.753(2)(d)4 as near as possible. Based on distance limitations, we attempted to surround the site as nearly as possible to locate a receptor downwind regardless of wind direction.

(c) Monitoring equipment will be the Modified Nipher Gauge as required by Chapter 17-2.753(2)(b)1. Wind speed and directional equipment has not been selected as yet, but will be a reliable instrument to perform that function. Hi Vols will not be used.

(d) Method and frequency of monitoring will be performed as required by Chapter 17-2.753(2)(d).

(e) Quality assurance measures will be provided by the laboratory chosen to perform analyses.

(f) Schedule for monitoring reports submission will comply with Specific Condition #9 of the subject permit.

Agrico Mining Company—A Division of Agrico Chemical Company ∘ P. O. Box 1110 ∘ Mulberry, Florida 33860
813/428-1431

(g) Commencement date of the monitoring network cannot be predicted at this time.

If you have any questions regarding this information, please contact me.

Very truly yours,

H.W. Long, Jr.
Manager
Environmental Control

HWL:crl
cc: V. Snow
E. de la Parte

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301-8241

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

February 19, 1986

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Harold Long, Jr.
Agrico Chemical Company
P. O. Box 1110
Mulberry, Florida 33860

Dear Mr. Long:

Re: Permit AC 29-5954, Solid Sulfur Handling and Storage Facility, Specific Conditions 8(a) and (b)

The department has received and reviewed your submittal dated December 18, 1985, on the above referenced permit conditions and has determined that additional information will be required to evaluate your ambient air and deposition monitoring plan.

Please submit information regarding:

a) Monitoring plan objectives.
b) Basis for selection of monitoring sites including pertinent data (e.g., wind rose data, etc.)
c) Description of the ambient air and deposition monitoring equipment (e.g., hi-vols, nipher guages, wind speed and direction instrument).
d) Method and frequency of monitoring evaluation
e) Quality assurance measures.
f) Schedule for monitoring reports submission.
g) Commencement date of the monitoring network.

If you have any questions, please contact Pradeep Raval at (904)488-1344 or write to me at the above address.

Sincerely,

C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality Management

CHF/PR/s
cc: Ed de la Parte
Bill Thomas
Ivan Choronenko

P 408 533 180

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED—
NOT FOR INTERNATIONAL MAIL

(See Reverse)

Sent to Mr. Harold Long, Jr.	
Street and No.	
P.O., State and ZIP Code	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to whom and Date Delivered	
Return Receipt Showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	$
Postmark or Date 2/21/86	

PS Form 3800, Feb. 1982

PS Form 3811, July 1983

SENDER: Complete items 1, 2, 3 and 4.

Put your address in the "RETURN TO" space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for service(s) requested.

1. ☐ Show to whom, date and address of delivery.
2. ☐ Restricted Delivery.

DER
FEB 27 1986
BAOM

3. Article Addressed to:
Mr. Harold Long, Jr.
Agrico Chemical Co.
P. O. Box 1110
Mulberry, FL 33860

4. Type of Service:
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail

Article Number
P 408 533 180

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature – Addressee
X

6. Signature – Agent
Kenneth R. Goddard

7. Date of Delivery
2-24-86

8. Addressee's Address *(ONLY if requested and fee paid)*

DOMESTIC RETURN RECEIPT

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301-8241

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
NOTICE OF PERMIT

modification

Mr. Harold Long, Jr.
Agrico Chemical Company
Post Office Box 1110
Mulberry, Florida 33860

October 2, 1985

Enclosed is Permit Number AC 29-5954 to Agrico Chemical Company which authorizes the construction of a solid sulfur storage and handling system at Agrico's existing facility in Hillsborough County, Florida. This permit is issued pursuant to Section 403, Florida Statutes.

Any Party to this permit has the right to seek judicial review of the permit pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the clerk of the Department in the Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32301; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date this permit is filed with the clerk of the Department.

Sincerely,

C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality
Management

Enclosure

cc: Edward de la Parte
L. M. Buddy Blain
Judith Smith Cavanaugh, J.D.
Bill Thomas
Iwan Choronenko

CERTIFICATION

This is to certify that the foregoing Notice of Permit and all copies requested were mailed before the close of business on 3 OCTOBER, 1985.

C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality
Management
2600 Blair Stone Road
Tallahassee, Florida 32301

FILING AND ACKNOWLEDGEMENT
FILED, on this date, pursuant to §120.52(9), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Judy Rogers
Clerk

10-3-85
Date

P 408 533 617

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED—
NOT FOR INTERNATIONAL MAIL

(See Reverse)

Sent to Harold Long	
Street and No. Old Highway 37 S. (Pierce)	
P.O., State and ZIP Code Mulberry, Fl 33860	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to whom and Date Delivered	
Return Receipt Showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	$
Postmark or Date	

PS Form 3800, Feb. 1982

PS Form 3811, July 1983

SENDER: Complete items 1, 2, 3 and 4.

Put your address in the "RETURN TO" space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for service(s) requested.

1. ☒ Show to whom, date and address of delivery.
2. ☐ Restricted Delivery.

3. Article Addressed to:
Harold Long, Jr.
Agrico Chemical Co
Old Highway 37 South, (Pierce)
Mulberry, Fl 33860

4. Type of Service:
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail

Article Number
P 408533617

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature — Addressee
X [signature]

6. Signature — Agent
X

7. Date of Delivery
10-7-85

8. Addressee's Address *(ONLY if requested and fee paid)*

DOMESTIC RETURN RECEIPT

Final Determination

Agrico Chemical Company
Big Bend Terminal
Hillsborough County, Florida

Solid Sulfur Handling and
Storage Operation

Permit Number:
AC 29-5954

Florida Department of Environmental Regulation
Bureau of Air Quality Management
Central Air Permitting

October 2, 1985

Final Determination

Agrico Chemical Company's application to modify a permit to construct the solid sulfur handling and storage facility at Big Bend, Hillsborough County, Florida, has been reviewed by the Bureau of Air Quality Management. Public Notice of the department's Intent to Issue the modified permit was published in the Tampa Tribune on August 23, 1985.

Comments were received on the department's technical evaluation from the applicant about the modeling results (see attachment 5). These comments, however, do not affect the modified permit and therefore, the final action of the department will be to issue the modified permit as proposed in the preliminary determination.

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301-8241

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

PERMITTEE:
Agrico Chemical Company
P. O. Box 1110
Mulberry, Florida 33860

Permit Number:AC 29-5954
Expiration Date: April 1, 1988
County: Hillsborough
Latitude/Longitude: 27° 48' 19"N/
82° 24' 40"W
Project: Solid Sulfur Ship
Unloading, Storage, and
Shipping Facility

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rule(s) 17-2 and 17-4. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawings, plans, and other documents attached hereto or on file with the department and made a part hereof and specifically described as follows:

For the construction of a solid sulfur ship unloading and storage facility consisting of a dockside traveling gantry equipped with a tight-lipped clamshell bucket, a dockside receiving hopper; conveyor belts, a storage building, front-end loaders, a reloading hopper, a load-out conveyor belt, a surge bin for truck loading, and a water spray system.

Construction shall be in accordance with the attached permit application unless otherwise stated in the general and specific conditions herein.

Attachments are as follows:

1. Agrico Chemical Company's permit modification application, DER form 17-1.202(1) dated October 12, 1984.
2. DER's response letter dated October 25, 1984.
3. Agrico's Air Quality Impact Analysis dated May 6, 1985.
4. Agrico's Storage Building Plans dated June 17, 1985.
5. Letter from Agrico dated September 23, 1985.

PERMITTEE:
Agrico Chemical Company

Permit Number: AC 29-5954
Expiration Date: April 1, 1988

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 Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is hereby placed on notice that the department will review this permit periodically and may initiate enforcement 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 applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the department.

3. As provided in Subsections 403.087(6) and 403.722(5), 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. This permit does not constitute a waiver of or approval of any other department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute state recognition or acknowledgement of title, and does not constitute authority for the use 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.

5. 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, unless specifically authorized by an order from the department.

GENERAL CONDITIONS:

6. The permittee shall at all times properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by department rules.

7. The permittee, by accepting this permit, specifically agrees to allow authorized department personnel, upon presentation of credentials or other documents as may be required by law, access to the premises, at reasonable times, where the permitted activity is located or conducted for the purpose of:

a. Having access to and copying any records that must be kept under the conditions of the permit;

b. Inspecting the facility, equipment, practices, or operations regulated or required under this permit; and

c. Sampling or monitoring any substances or parameters at any location reasonably necessary to assure compliance with this permit or department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. 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 noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance.

GENERAL CONDITIONS:

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.

9. 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 Sections 403.73 and 403.111, Florida Statutes.

10. The 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.

11. This permit is transferable only upon department approval in accordance with Florida Administrative Code Rules 17-4.12 and 17-30.30, as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the department.

12. This permit is required to be kept at the work site of the permitted activity during the entire period of construction or operation.

13. This permit also constitutes:

( ) Determination of Best Available Control Technology (BACT)
( ) Determination of Prevention of Significant Deterioration (PSD)
( ) Compliance with New Source Performance Standards.

14. The permittee shall comply with the following monitoring and record keeping requirements:

a. Upon request, the permittee shall furnish all records and plans required under department rules. The retention period for all records will be extended automatically, unless otherwise stipulated by the department, during the course of any unresolved enforcement action.

GENERAL CONDITIONS:

b. The permittee shall retain at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation), copies of all reports required by this permit, and records of all data used to complete the application for this permit. The time period of retention shall be at least three years from the date of the sample, measurement, report or application unless otherwise specified by department rule.

c. Records of monitoring information shall include:

- the date, exact place, and time of sampling or measurements;
- the person responsible for performing the sampling or measurements;
- the date(s) analyses were performed;
- the person responsible for performing the analyses;
- the analytical techniques or methods used; and
- the results of such analyses.

15. When requested by the department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the department, such facts or information shall be submitted or corrected promptly.

SPECIFIC CONDITIONS:

1. The Agrico Big Bend sulfur facility shall handle a maximum of 672,000 tons per year (TPY), or 600,000 long tons per year (LTPY), of standard sulfur pellets.

SPECIFIC CONDITIONS:

2. The maximum annual operating hours and rates for the operations at the sulfur facility are summarized below, with regards to material transfer:

	Transfer Operation	Operating Hours	Operating Rates (TPH)
a)	Ship to storage	1000	672
b)	Storage activity	8000	NA
c)	Storage to trucks	8000	84

3. The emissions of particulate matter from the sulfur storage building shall not exceed 1.7 lbs/hr for Agrico's 56,000 ton storage capacity, or 7 TPY.

4. There shall be no visible emissions (5% opacity, six minute average) from any source within the sulfur handling area.

5. All applicable emissions limiting precautions and procedures specified in this permit application, and in Rule 17-2.600(11)(b), FAC, Solid Sulfur Storage and Handling Facilities, shall be followed at all times.

6. No unenclosed sulfur handling operation shall be conducted when wind speed is in excess of 18 mph (five minute average).

7. Construction and operation shall reasonably conform to the information submitted in this application.

8. The following shall be submitted to Central Air Permitting (CAPS) for approval within 90 days after issuance of this construction permit, in accordance with Rule 17-2.540, FAC, and Rule 17-2.600(11)1, FAC, respectively:

(a) A post-construction Air Quality and Sulfur Particulate Deposition Monitoring Plan, which will be in effect for a minimum of two years from the date of issuance of the initial air operating permit.

(b) A detailed marine vessel unloading procedure shall be developed to minimize emissions of sulfur particulate.

SPECIFIC CONDITIONS:

9. The following shall be submitted to Hillsborough County Environmental Protection Commission (HCEPC) and DER's Southwest District office, within 45 days of completion of tests, and a minimum of 90 days before the expiration date of the construction permit, for approval (copy of submittal shall be sent to Central Air Permitting Office, CAPS):

(a) Initial compliance tests reports of the DER Method 5 (Determination of Particulate Emissions from Stationary Sources using liquid impingement) conducted on emissions from the storage building.

(b) Initial compliance test reports of the DER Method 9 (Visual Determination of the Opacity for Emissions from Stationary Sources) for all the sources within the sulfur handling area.

(c) Initial sulfur deposition monitoring report, conducted according to Rule 17-2.753(2), FAC, (DER Reference Method for Monitoring the Deposition of Sulfur Particulate).

10.The applicant shall demonstrate compliance with the conditions of the construction permit and submit a complete application for an operating permit to Hillsborough County Environmental Protection Commission (HCEPC) (Copy to DER Southwest District office and CAPS), a minimum of 90 days prior to the expiration date of the construction permit.

11. Annual compliance tests shall be performed at 90-100% of the permitted operating rates and with a minimum wind speed of 8 mph (five minute average) for DER Method 9.

12. A 15 day prior notification of the compliance testing date(s) shall be given to DER's Southwest District office, Central Air Permitting and HCEPC.

13. A 15 day prior notification shall also be given of the unloading dates of the first three ships, to DER Southwest District office, Central Air Permitting, and HCEPC.

14. Upon obtaining an operating permit, the applicant will be required to submit annual reports on the actual operation and emissions of the source to the DER's Southwest District office and HCEPC.

15. Any significant delay in the construction or completion of this project shall be reported to the DER's Southwest District HCEPC, and CAPS.

PERMITTEE:
Agrico Chemical Company

Permit Number: AC 29-5954
Expiration Date: April 1, 1988

Issued this 1 day of October 1985

STATE OF FLORIDA DEPARTMENT OF
ENVIRONMENTAL REGULATION

Victoria J. Tschinkel

VICTORIA J. TSCHINKEL, Secretary

____ pages attached.

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

Interoffice Memorandum

FOR ROUTING TO OTHER THAN THE ADDRESSEE

To: _____ Loctn: _____
To: _____ Loctn: _____
To: _____ Loctn: _____
From: _____ Date: _____

TO: Victoria J. Tschinkel

FROM: for Clair Fancy BT

DATE: October 2, 1985

SUBJ: Approval of Attached Air Construction Permit

Attached for your approval and signature is one Air Construction Permit to Agrico Chemical Company to modify their Big Bend solid sulfur handling and storage facility in Hillsborough County, Florida.

The waiver date, after which the permit would be issued by default, is October 8, 1985.

The Bureau recommends your approval and signature.

CF/pa

Attachment

Agrico
ONE OF THE WILLIAMS COMPANIES

August 28, 1985

Mr. Bill Thomas
Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

Dear Mr. Thomas:

Enclosed is the original proof of publication of the legal Notice of Proposed Agency Action of intent to issue a permit to Agrico Chemical Company. The notice appeared in the Tampa Tribune on August 23, 1985.

Very truly yours,

H.W. Long, Jr.
Manager
Environmental Control

HWL:crl
enclosure
cc: Mr. V. Snow
Mr. E. de la Parte
Mr. V. San Augustin
Mr. B. Thomas

THE TAMPA TRIBUNE

Published Daily
Tampa, Hillsborough County, Florida

State of Florida
County of Hillsborough } ss.

DER
AUG 30 1985
BAQM

Before the undersigned authority personally appeared G. T. Gleason, who on oath says that he is Controller 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 Notice of Proposed Agency Action on Permit Application.

was published in said newspaper in the issues of .....

August 23, 1985

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.

G. T. Gleason

Sworn to and subscribed before me, this 23rd *day of* August, *A.D. 19* 85

Debra Lynne Bouchard
Notary Public, State of Florida
My Commission Expires Jan. 6, 1989
Bonded Thru Troy Fain - Insurance, Inc.

DEBRA LYNNE BOUCHARD NOTARY PUBLIC STATE OF FLORIDA (SEAL)

State of Florida
Department of
Environmental Regulation
Notice of Proposed
Agency Action
on Permit Application

The Department of Environmental Regulation gives notice of its intent to issue a permit to Agrico Chemical Company to modify a permit to construct a solid sulfur handling and storage system at Agrico's existing Big Bend facility in Hillsborough County, Florida. A determination of best available control technology (BACT) was not required.

Persons whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must conform to the requirements of Chapters 17-103 and 28-5, Florida Administrative Code, and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Twin Towers Office Building, Tallahassee, Florida 32301, within fourteen (14) days of publication of this notice. Failure to file a request for hearing within this time period constitutes a waiver of any right such person may have to request an administrative determination (hearing) under 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. Therefore, persons who may not wish to file a petition may wish 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 request a hearing under Section 120.57, Florida Statutes.

The application is available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at:

Dept. of
Environmental Regulation
Southwest District
7601 Highway 301 North
Tampa, Florida 33610

Hillsborough County
Environmental Protection
Commission
1900 Ninth Avenue
Tampa, Florida 33605

Dept. of
Environmental Regulation
Bureau of Air
Quality Management
2600 Blair Stone Road
Tallahassee, Florida 32301

Any person may send written comments on the proposed action to Mr. Bill Thomas at the department's Tallahassee address. All comments mailed within 30 days of the publication of this notice will be considered in the department's final determination.

3371 8/23/85

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301-8241

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

August 15, 1985

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Mr. Harold Long, Jr.
Agrico Chemical Company
P. O. Box 1110
Mulberry, Florida 33860

Dear Mr. Long:

Attached is one copy of the Technical Evaluation and Preliminary Determination, and proposed permit to construct a solid sulfur storage and handling system at your existing facility in Hillsborough County.

Before final action can be taken on your draft permit, you are required by Florida Administrative Code Rule 17-103.150 to publish the attached Notice of Proposed Agency Action in the legal advertising section of a newspaper of general circulation in Hillsborough County no later than fourteen days after receipt of this letter. The department must be provided with proof of publication within seven days of the date the notice is published. Failure to publish the notice may be grounds for denial of the permit.

Please submit, in writing, any comments which you wish to have considered concerning the department's proposed action to Mr. Bill Thomas of the Bureau of Air Quality Management.

Sincerely,

for C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality
Management

CHF/pa

Attachments

cc: Ed De La Parte
L. M. Buddy Blain
Judith Smith Cavanaugh, J.D.
Bill Thomas
Iwan Choronenko

P 085 152 636

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL

(See Reverse)

Sent to Mr. Harold Long, Jr.	
Street and No.	
P.O., State and ZIP Code	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to whom and Date Delivered	
Return receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	$
Postmark or Date 8/16/85	

PS Form 3800, Feb. 1982 ★ U.S.G.P.O. 1984-446-014

PS Form 3811, July 1983

SENDER: Complete items 1, 2, 3 and 4.

Put your address in the "RETURN TO" space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for service(s) requested.

1. ☐ Show to whom, date and address of delivery.
2. ☐ Restricted Delivery.

3. Article Addressed to:
Mr. Harold Long, Jr.
Agrico Chemical Company
P. O. Box 1110
Mulberry, FL 33860

4. Type of Service:
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail

Article Number: P 085 152 636

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature – Addressee
X

6. Signature – Agent
X

7. Date of Delivery
8-19-85

8. Addressee's Address *(ONLY if requested and fee paid)*

DOMESTIC RETURN RECEIPT

DER
AUG 22 1985
BAQM

BEFORE THE STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

In the Matter of an Application for Permit by:	)	
Agrico Chemical Company P. O. Box 1110 Mulberry, Florida 33860	)	DER File No. AC 29-5954

INTENT TO ISSUE

The Department of Environmental Regulation hereby gives notice of its Intent to Issue, and proposed order of issuance for, a permit pursuant to Chapter 403, Florida Statutes, for the proposed project as detailed in the application specified above. The Department is issuing this Intent to Issue for the reasons stated in the attached Technical Evaluation and Preliminary Determination.

The applicant, Agrico Chemical Company, applied on October 12, 1984, to DER to modify a permit to construct a solid sulfur storage and handling system at the applicant's existing facility in Hillsborough County, Florida.

The Department has permitting jurisdiction under Chapter 403, Florida Statutes and Florida Administrative Code Rules 17-2 and 17-4. The project is not exempt from permitting procedures. The applicant was officially notified by the Department that an air construction permit was required for the proposed work.

This intent to issue shall be placed before the Secretary for final action unless an appropriate petition for a hearing pursuant to the provisions of Section 120.57, Florida Statutes, is filed within fourteen (14) days from receipt of this letter or

publication of the public notice (copy attached) required pursuant to Rule 17-103.150, Florida Administrative Code, whichever occurs first. The petition must comply with the requirements of Section 17-103.155 and Rule 28-5.201, Florida Administrative Code (copy attached) and be filed pursuant to Rule 17-103.155(1) in the Office of General Counsel of the Department of Environmental Regulation at 2600 Blair Stone Road, Tallahassee, Florida 32301.

Petitions which are not filed in accordance with the above provisions are subject to dismissal by the Department. In the event a formal hearing is conducted pursuant to Section 120.57(1), all parties shall have an opportunity to respond, to present evidence and argument on all issues involved, to conduct cross-examination of witnesses and submit rebuttal evidence, to submit proposed findings of facts and orders, to file exceptions to any order or hearing officer's recommended order, and to be represented by counsel. If an informal hearing is requested, the agency, in accordance with its rules of procedure, will provide affected persons or parties or their counsel an opportunity, at a convenient time and place, to present to the agency or hearing officer, written or oral evidence in opposition to the agency's action or refusal to act, or a written statement challenging the grounds upon which the agency has chosen to justify its action or inaction, pursuant to Section 120.57(2), 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. Therefore, persons who may not wish to file a petition, may wish to intervene in the proceeding. A petition for intervention must be filed pursuant to Model Rule 28-5.207 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, 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 request a hearing under Section 120.57, Florida Statutes.

Executed the 16th day of August, 1985, in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

for C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality
Management

Copies furnished to:

Ed De La Parte
L. M. Buddy Blain
Judith Smith Cavanaugh, J.D.
Bill Thomas
Iwan Choronenko

CERTIFICATION

This is to certify that the foregoing Intent to Issue and all copies were mailed before the close of business on Aug 16, 1985.

for C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality
Management
2600 Blair Stone Road
Tallahassee, Florida 32301

FILING AND ACKNOWLEDGEMENT
FILED, on this date, pursuant to §120.52(9), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Patricia G. Adams — Clerk
August 16, 1985 — Date

Technical Evaluation
and
Preliminary Determination

Agrico Chemical Company
Big Bend Terminal
Hillsborough County, Florida

Solid Sulfur Handling and
Storage Operation

Permit Number: AC 29-5954

Florida Department of Environmental Regulation
Bureau of Air Quality Management
Central Air Permitting

August 13, 1985

State of Florida
Department of Environmental Regulation
Notice of Proposed Agency Action
on Permit Application

The Department of Environmental Regulation gives notice of its intent to issue a permit to Agrico Chemical Company to modify a permit to construct a solid sulfur handling and storage system at Agrico's existing Big Bend facility in Hillsborough County, Florida. A determination of best available control technology (BACT) was not required.

Persons whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must conform to the requirements of Chapters 17-103 and 28-5, Florida Administrative Code, and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Twin Towers Office Building, Tallahassee, Florida 32301, within fourteen (14) days of publication of this notice. Failure to file a request for hearing within this time period constitutes a waiver of any right such person may have to request an administrative determination (hearing) under 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. Therefore, persons who may not wish to file a petition may wish 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 request a hearing under Section 120.57, Florida Statutes.

The application is available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at:

Dept. of Environmental Regulation
Southwest District
7601 Highway 301 North
Tampa, Florida 33610

Hillsborough County Environmental Protection Commission
1900 Ninth Avenue
Tampa, Florida 33605

Dept. of Environmental Regulation
Bureau of Air Quality Management
2600 Blair Stone Road
Tallahassee, Florida 32301

Any person may send written comments on the proposed action to Mr. Bill Thomas at the department's Tallahassee address. All comments mailed within 30 days of the publication of this notice will be considered in the department's final determination.

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.

I. Application Synopsis

A. Applicant

Agrico Chemical Company
P. O. Box 1110
Mulberry, Florida 33860

B. Project and Location

The applicant proposes to modify a permit to construct a solid sulfur handling and storage system at the applicant's existing Big Bend facility in Hillsborough County. The project will consist of a marine vessel unloading system, storage system and a truck loadout system.

The UTM coordinates of the facility are: Zone 17-360,945 m East and 3,076,218 m North.

C. Sources Reviewed

Material transfer operations at the proposed sulfur facility will result in unconfined, fugitive, and vented emissions of sulfur particulate matter. The primary sources of these particulate emissions (from sulfur pellets handling) are listed below.

i) Ship Unloading Area

- Clamshell to hopper
- Hopper to conveyor belt
- Belt to belt transfer

ii) Storage Pile Enclosure

- Tripper conveyor to storage pile
- Payloader traffic
- Payloader to conveyor belt

iii) Truck Loadout Area

- Conveyor belt to bin
- Bin dump
- Bin to truck

D. Standard Industrial Classification Code (SIC)

The facility at Big Bend is classified as: Group No: 422 Public Warehousing, Industry No: 4225 General Warehousing

E. Facility Category

Agrico's marine terminal facility at Big Bend is classified as a minor emitting facility for the air pollutant particulate matter.

F. Application Completeness Date

i) Initial application: October 12, 1984

ii) Application deemed complete: June 17, 1985

II. Project Description

A. Project and Controls

The proposed solid sulfur installation will consist of a system to unload standard sulfur pellets, as designated in Rule 17-2.100(179), FAC,from a marine vessel; transfer to a storage enclosure at a maximum rate of 600 long tons per hour (LT/hr); and loadout from storage to trucks, at a maximum rate of 75 LT/hr. The sulfur pellets will be unloaded from a marine vessel by a tight lipped clamshell bucket and transferred into an enclosed hopper, which will feed a covered belt conveyor. The pellets will then be transferred to the storage building, where a tripper conveyor will unload it onto the enclosed storage pile. Storage capacity within the building will be 50,000 LT. Payloaders operating inside the building will transfer the sulfur pellets from the storage pile to a conveyor belt. An inclined covered conveyor belt will transfer the material from the storage building to the truck loading area. Sulfur pellets will be fed into a hopper which in turn will load trucks for shipment to Agrico's South Pierce facility. Annual throughput of sulfur at this marine terminal will be limited to 600,000 LT.

Control of unconfined and fugitive emissions will be maintained by covering/enclosing equipment and areas where sulfur pellets will be transferred or stored, using water sprays with effective wetting agents at transfer points, maintaining cautious operating practice, and adhering to regular maintenance schedules for various equipment and roads.

B. Operating Times and Rates

The maximum operating times and rates of sulfur handling units are summarized below:

Unit	Capacity (LT)	OPTG Rate (LT/hr)	Annual OPTG Hours (hrs)
Ship	30,000	600	1000
Clamshell Bucket	NA	600	1000
Dockside Hopper	NA	600	1000
Belt Conveyor	1100/hr	600	1000
Storage - Load-in	50,000	600	1000
Storage - Load-out	50,000	75	8000
Payloader	NA	75	8000
Truck Bin Loadout	50	75	8000
Truck	25	75	8000

Note: (a) Tons (T) refers to short tons unless otherwise indicated as long tons (LT).

(b) Although the storage building activity is carried out for 8,000 hrs/yr, the actual storage pile exists all year round.

III. Rule Applicability

The proposed project will emit the pollutant particulate matter and is subject to preconstruction review under Chapter 17-2 of the Florida Administrative Code (FAC).

The proposed project will be located within five kilometers of the nonattainment area for particulate matter in Hillsborough County under Rule 17-2.420, FAC. However, the proposed project is not subject to the Nonattainment Area New Source Review Requirements because it will be a minor modification to a minor facility, under Rule 17-2.510(2)(d)3, FAC.

The proposed project will be subject to the Source Specific New Source Review Requirements and shall be permitted under Rule 17-2.540(2), FAC, Sulfur Storage and Handling Facilities.

The proposed project shall prepare a preconstruction Ambient Air Quality Analysis and a Sulfur Deposition Analysis, as specified under Rule 17-2.540(2), FAC, using methods of emission estimation as specified in Rule 17-2.215, FAC.

The proposed project shall conduct post-construction air quality and sulfur deposition monitoring as specified under Rule 17-2.540(2)(c), FAC.

The proposed project shall comply with the Specific Source Emission Limiting Standards under Rule 17-2.600(11)(b), FAC, Solid Sulfur Storage and Handling Facilities.

The proposed project shall not handle, transfer, or store any form of solid sulfur other than standard sulfur pellets, in accordance with Rule 17-2.600(11), FAC.

The proposed project shall employ, as a minimum, the practices to minimize the emission of sulfur particulate matter into the atmosphere, as listed under Rule 17-2.600(11)(b), FAC; for:

1. Marine Vessel Unloading
2. Solid Sulfur Transfer
3. Solid Sulfur Storage

The proposed project shall not allow emissions from the storage building in excess of 0.03 lbs/hr per 1000 T of storage capacity, under Rule 17-2.600(11)(b)3, FAC.

The proposed project shall not have any visible emissions (5% opacity, six minute average), from any emission point in the solid sulfur handling area, in accordance with Rule 17-2.600(11)(b)5, FAC.

The proposed project shall be required to show compliance with emission standards by conducting DER Method 5, Determination of Particulate Emissions from Stationary Sources (by liquid impingement) in accordance with Rule 17-2.700(6)(a)5, FAC.

The proposed project shall also conduct compliance test, DER Method 9, Visual Determination of the Opacity of Emissions from Stationary Sources, in accordance with Rule 17-2.700(6)(a)9, FAC, for all the sources in the sulfur handling area.

The proposed project shall file reports of compliance tests in accordance with Rule 17-2.700(7), FAC.

IV. Ambient Air and Deposition Analysis

A. Introduction

The Agrico Chemical Company is proposing to construct a solid sulfur unloading and storage and shipping facility in Hillsborough County, Florida. The proposed facility is to be located at Agrico's Big Bend Terminal, the site of their existing granular fertilizer and phosphate rock receiving, storage, and shipping facility. The project is subject to Rule 17-2.540, FAC - Source Specific New Source Review Requirements. These requirements include:

- Preconstruction Ambient Air Quality Analysis;
- Preconstruction Sulfur Deposition Analysis, and;
- Postconstruction Monitoring.

The applicant has submitted the required preconstruction analyses. Based on these analyses, the department has reasonable assurance that the proposed solid sulfur handling and storage facility at the Agrico Big Bend Terminal, as described in this report and subject to the conditions of approval proposed herein, will not cause or contribute to a violation of any ambient air quality standard or prevention of significant deterioration (PSD) increment. A discussion of the modeling methodology and required analyses follows.

B. Modeling Methodology

The EPA-approved Industrial Source Complex (ISC) model was used to predict 24-hour and annual average particulate matter ambient concentrations, and monthly and annual average particulate matter deposition. The ISC model is actually two separate models: a short-term model (ISCST), and a long-term model (ISCLT). The short-term model was used to predict the 24-hour average ambient concentrations using sequential, hourly meteorological data. The long-term model was used to predict annual average ambient concentrations, and monthly and annual average deposition using joint frequencies of wind direction, wind speed, and atmospheric stability.

The ISC models allow for various options to be selected based upon the geographical area and source characteristics of the industrial facility. These options include: distinguishing between point, area, and volume type sources; urban versus rural geography; building induced downwash; and gravitational settling of large particulates. The applicant has properly used the options available to best model the facility. The details of modeling methodology are contained in the attached air quality assessment submitted by the applicant.

The individual sources of particulate matter emissions for both the sulfur and phosphate storage and handling facilities are listed in Tables 1 and 2. The initial plume dispersion for the volume type sources were calculated in accordance with the guidelines contained in the ISC Users Manual. The length, width, and height dimensions of the storage building were used in the model to account for building wake downwash for the three point sources located on top of the building. All of the phosphate handling facility sources were modeled as points.

Tables 3 and 4 list the particulate matter emission rates used in the models for both the sulfur and phosphate handling facilities respectively. These emission rates were calculated according to the procedures specified in Rule 17-2.215, FAC.

Table 1

Source Attributes—Sulfur Facility

Source	Type	UTM E (km)	UTM N (km)	Source Dimensions/Attributes (1) Height (m)	Horizontal (m)	Vertical (m)	Initial Plume Dispersion or Bldg. Dimensions (2) Height (m)	Temperature (K)	Exit Velocity (m/s)	Diameter (m)	Horizontal (m)	Vertical (m)
Clamshell to Hopper	Elevated Volume	361.10	3076.39	13.41	10.06	7.31					2.35	1.71
Hopper to Belt	Elevated Volume	361.10	3076.39	2.13	1.83	1.83					0.43	0.43
Belt to Hold	Ground based Volume	361.02	3076.39	3.81	3.05	7.62					0.70	3.54
Storage Building	Point	361.01	3076.10	21.95				Ambient	0.10	1.00	106.1(3)	21.9(4)
	Point	361.01	3076.14	21.95				Ambient	0.10	1.00	106.1(3)	21.9(4)
	Point	361.01	3076.18	21.95				Ambient	0.10	1.00	106.1(3)	21.9(4)
Truck Loadout Building	Elevated Volume	361.045	3076.30	12.19	6.10	15.24					1.43	7.10
Truck Building	Ground based Volume	361.045	3076.3	2.29	6.10	4.57					1.43	2.13

(1) Volume source dimensions; Horizontal and Vertical dimensions of volume sources
(2) Point source attributes; Stack height, Exit velocity, and Stack Diameter
(3) Horizontal dimension of equivalent square building (used as both width and length of the storage building)
(4) Vertical dimension of the storage building.

Table 2

Source Attributes—Phosphate Rock and Fertilizer Facility

Source (1)	UTM E (km)	UTM N (km)	Height (m)	Temperature (K) (2)	Velocity (m/s)	Diameter (m)
DC-A	362.255	3076.16	38.10	304	12.68	2.18
DC-B	362.225	3076.23	22.86	304	12.83	0.84
DC-C	362.195	3076.20	22.86	304	12.83	0.84
DC-D	361.515	3076.23	13.72	304	12.83	0.84
DC-E	361.495	3076.34	13.72	304	12.83	0.84
DC-F	361.285	3076.35	22.86	304	12.92	1.52
DC-G	362.095	3076.29	22.86	304	12.83	0.84
DC-H	361.505	3076.28	18.29	304	12.83	0.84
SCR-J	361.825	3076.30	38.10	304	12.13	1.22
SCR-K	361.595	3076.30	38.10	304	12.13	1.22
DC-L	362.165	3076.19	18.29	304	12.83	0.84
DC-A'	361.305	3076.16	38.10	304	12.83	1.68
DC-B'	361.345	3076.20	12.19	304	12.77	0.69
DC-C'	361.185	3076.18	18.29	304	12.77	0.69
DC-D'	361.185	3076.14	39.62	304	12.77	0.69
DC-E'	361.425	3076.19	15.24	304	12.77	0.69
DC-1	361.445	3076.16	22.86	304	13.08	0.45

(1) All point type sources; DC- Dust Collector, SCR - Scrubber
(2) Stack temperatures estimated at 15°F above ambient temperature of 72°F.

Table 3

Sulfur Particulate Emission Rates

Activity	Suspended Particulate Emissions lb/hr	Suspended Particulate Emissions short TPY	Total Particulate Emissions lb/hr	Total Particulate Emissions short TPY
WET-FORMED PRILL				
Ship to Storage				
Clamshell to hopper	0.056	0.028	0.118	0.059
Hopper to conveyor belt	0.036	0.018	0.076	0.038
Conveyor belt-to-belt transfer	0.036	0.018	0.076	0.038
Conveyor belt to storage pile	0.605	0.302	0.419	0.209
Storage Pile Activity				
Vehicle traffic	0.375	1.50	0.260	1.040
Payloader to conveyor belt	0.030	0.027	0.0048	0.019
Truck Loadout				
Conveyor belt to receiving bin	0.0045	0.018	0.0095	0.038
Bin dump	0.030	0.121	0.063	0.254
Bin to truck	0.030	0.121	0.063	0.254
Total	1.179	2.153	1.0893	1.949
AIR-FORMED PRILL				
Ship to Storage				
Clamshell to hopper	0.045	0.022	0.095	0.046
Hopper to conveyor belt	0.029	0.015	0.061	0.032
Conveyor belt-to-belt transfer	0.029	0.015	0.061	0.032
Conveyor belt to storage pile	0.484	0.242	0.335	0.168
Storage Pile Activity				
Vehicle traffic	0.375	1.50	0.260	1.040
Payloader to conveyor belt	0.0055	0.022	0.0038	0.015
Truck Loadout				
Conveyor belt to receiving bin	0.0036	0.015	0.0076	0.032
Bin dump	0.024	0.097	0.050	0.204
Bin to truck	0.024	0.097	0.050	0.204
TOTAL	1.019	2.025	0.9234	1.773

Note: Suspended Particulate Emissions include all emissions generated and do not take into consideration gravitational settling and deposition of particulate inside the storage building. The column of Total Particulate Emissions does include those factors.

Table 4

Phosphate Rock and Fertilizer Storage and Handling
Particulate Emission Rates

Source(1)	Permitted Particulate Emissions (lb/hr)	(TPY)
DC-A	15.33	7.95
DC-B	2.30	1.19
DC-C	2.30	1.19
DC-D	2.30	2.38
DC-E	2.30	1.22
DC-F	7.66	6.01
DC-G	2.30	1.19
DC-H	2.30	1.19
SCR-J	6.84	3.60
SCR-K	6.84	3.60
SCR-L	2.30	1.19
DC-A'	9.20	3.68
DC-B'	1.53	0.61
DC-C'	1.53	0.61
DC-D'	1.53	0.61
DC-E'	1.53	0.61
DC-1	5.00	3.57
TOTAL	73.09	40.40

(1) DC - Dust Collector; SCR - Scrubber

In addition to the sources located at, or proposed to be located at, the Agrico Big Bend Terminal, the applicant has included in the modeling analysis particulate matter sources at the TECO Big Bend power plant and Gardinier Phosphate Company. These were the only other facilities expected to have a significant interaction with Agrico. All other sources of ambient particulate matter concentrations were included in a background concentration determined from local monitoring and added to the predicted modeled impacts.

The meteorological data used for the analyses consisted of a five-year period (1974, 1975, 1978, 1979, and 1981) of hourly surface weather observations from the National Weather Service station in Tampa and upper air observations from Ruskin. Since five years of data were used, the highest, second-high short-term predicted concentrations were compared with the appropriate ambient standards. For the long-term predicted concentrations and deposition, these same data were processed into annual joint frequency distributions of wind speed, wind direction and atmospheric stability. Further, for the required monthly average deposition calculations, monthly average joint frequency distributions were calculated and used for only the year in which the highest annual ambient concentrations occurred.

The particulate deposition rate analysis requires the applicant to define the particle size distribution. Given this distribution, the applicant separated the total particulate emissions into 10 size categories, each of equal mass. The gravitational settling velocity and surface reflection coefficient for each size category were calculated as specified in the ISC Users Manual. The ISCLT model used this information to calculate the maximum monthly and annual deposition rates.

The post-processing computer program, Calms Processor (CALMPRO), was used to adjust the short-term average concentrations when calm wind conditions occurred within the averaging period. The purpose of this post-processing was to adjust for the artificial persistence of wind direction in the processed hourly meteorological data set. Long-term predicted concentrations and deposition rates were not adjusted for calm conditions.

The receptor locations used in the modeling analysis began at the plant boundary of the Big Bend Terminal. The first ring of receptors were placed along this boundary unless a particular source within the facility was within 100 meters of the boundary. In that case the receptor was moved to a minimum of 100 meters from the source. Additional receptors were placed beyond the plant boundary with the densest array located to the northwest of the facility where the highest concentrations were expected. Because the facility emissions are to be released from relatively low level it was expected that the highest concentrations would

occur near the plant boundary. Hence, most of the receptors are located near the plant property. Special receptors were also placed along the edge of the particulate nonattainment area approximately four kilometers to the north.

The modeling methodology used by the applicant, as outlined above and explained in more detail in the applicant's air quality assessment report, followed the procedures and recommendations of the department.

C. Analysis of Existing Air Quality

The total ambient impact to an area is determined by adding the predicted modeled impacts to the existing background concentration. The existing background level is often estimated from air quality monitoring data located near the proposed new or modified facility. The background concentration should account for all sources not included in the dispersion modeling calculations. However, the air monitoring data usually includes the impacts of many of the modeled sources.

Four total suspended particulate matter monitors are located within 10 kilometers of the Agrico Big Bend Terminal. Table 5 lists these monitoring sites along with the 1984 data summary. Two of these sites (1800-066 and 1800-083) are located within the Tampa particulate nonattainment area. Since particulate matter emissions, both fugitive and captured, within the nonattainment area are more concentrated, it is expected that the other two monitors better represent the ambient conditions near the Big Bend Terminal.

Using the highest, second-highest 24-hour measured concentration from these monitors to represent a 24-hour background, and the highest annual concentration for the annual background value (both occuring at the nearest site, 1800-085) the background values are 69 ug/m^3, 24-hour average, and 40 ug/m^3, annual average.

D. PSD Increment Analysis

The Agrico Big Bend Terminal is located in an area designated as "attainment" for meeting the ambient air quality standard for particulate matter. As such, increased emissions of this pollutant occurring after the baseline date must not cause ambient concentrations to increase beyond specified amounts known as PSD increments. Both the new sulfur handling facility and the previously permitted phosphate rock and fertilizer handling facility are subject to the PSD increment limitations.

Table 5

Particulate Matter Monitoring Data - 1984

Site Number	Location with Respect to Agrico Facility: Direction	Distance (km)	No. of Observations	Annual Geometric Mean (ug/m^3)	Highest 24-hr (ug/m^3)	Second Highest 24-hr (ug/m^3)
1800-085	East-Southeast	3	61	40	72	69
1800-003	South-Southwest	10	61	38	84	68
1800-083	North-Northeast	7	63	51	105	100
1800-066	North	10	63	47	88	84

Table 6 summarizes the PSD increment consumption predicted to occur at the Agrico terminal. The maximum allowed increase (increment) is not exceeded.

E. Ambient Air Quality Standards Analysis

Given existing air quality in the area of the Agrico Big Bend Terminal, emissions from the proposed facility are not expected to cause or contribute to a violation of an ambient air quality standard (AAQS). The results of the AAQS analysis are contained in Table 7. These results were obtained using the modeling methodology previously discussed. A maximum expected ambient 24-hour average concentration of 102 ug/m^3 is predicted; the ambient standard is 150 ug/m^3. A maximum expected annual average concentration of 42 ug/m^3 is predicted; the ambient standard is 60 ug/m^3.

F. Particulate Deposition Rate Analysis

Table 8 gives the results of the sulfur particulate deposition rate analysis required by Rule 17-2.540, FAC. The maximum annual deposition rate predicted was 0.68 g/m^2 (15.0 lb/ha). The maximum monthly deposition rate predicted was 0.084 g/m^2 (1.85 lb/ha). There are no state or national standards with which to compare these deposition amounts.

G. Nonattainment Areas

The Agrico Big Bend Terminal is located within five kilometers of the Tampa particulate nonattainment area. Air quality modeling was performed to quantify the predicted impact on this area. The results are contained in Table 9. As can be seen, the impact of the increased particulate emissions on the nonattainment area are predicted to be less than the significant impact levels of 5 ug/m^3, 24-hour average, and 1 ug/m^3, annual average. As such, the nonattainment review requirements do not apply and no hinderance for the reasonable further progress of the nonattainment area to achieve compliance with the standards is expected.

V. Conclusion

The Agrico Chemical Company has applied to modify a permit to construct a solid sulfur handling and storage facility in Hillsborough County. The facility will be located at the existing Agrico Big Bend Terminal, the site of a previously permitted phosphate rock and fertilizer handling and storage facility.

The applicant has submitted along with the application an analysis of the impacts predicted to occur on the ambient air as a result of constructing the new facility. This analysis

Table 6

PSD Increment Consumption

Maximum Concentrations (ug/m^3)

Pollutant	Averaging Period	Proposed Sulfur Facility Only	Total Increment Consumption	Max. Allowable Increase
Particulate Matter	24-hour	8.2	30.9	37
	Annual	1.2	1.9	19

Table 7

Ambient Air Quality Impacts

Concentrations (ug/m^3)

Pollutant and Averaging Time	Maximum Impact Proposed Facility	Maximum Impact All Agrico Sources	Maximum Impact All Sources	Background	Total Impact	FAAQS
Particulate Matter						
24-hour	8.2	30.9	33.1	69	102.1	150
Annual	1.2	1.9	--	40	41.9	60

Table 8

Sulfur Particulate Deposition

Period (1)	Maximum Deposition g/m^2	lb/hectare
January	0.031	0.68
February	0.033	0.73
March	0.033	0.73
April	0.051	1.12
May	0.057	1.26
June	0.072	1.59
July	0.059	1.30
August	0.084	1.85
September	0.077	1.70
October	0.073	1.61
November	0.046	1.01
December	0.055	1.21
Annual	0.68	15.0

(1) Based on 1978 meteorology data

Table 9

Particulate Nonattainment Area Impact

Averaging Period	Maximum Impact (ug/m^3)	Significant Impact (ug/m^3)
24-hour	0.24	5
Annual	0.01	1

addressed all of the requirements of Chapter 17-2, FAC for an air quality impact analysis. Based on this information, submitted by Agrico Chemical Company, the department has reasonable assurance that the construction of the new sulfur handling and storage facility, as described in this report and subject to the conditions of approval proposed herein, will not cause or contribute to a violation of an ambient air quality standard or PSD increment, or any other provision of Chapter 17-2, FAC.

In addition to the preconstruction review discussed in this report, the applicant is required by rule to complete post-construction monitoring for both ambient air particulate and deposition of particulate.

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301-8241

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

PERMITTEE:
Agrico Chemical Company
P. O. Box 1110
Mulberry, Florida 33860

Permit Number:AC 29-5954
Expiration Date: April 1, 1988
County: Hillsborough
Latitude/Longitude: 27° 48' 19"N/ 82° 24' 40"W
Project: Solid Sulfur Ship Unloading, Storage, and Shipping Facility

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rule(s) 17-2 and 17-4. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawings, plans, and other documents attached hereto or on file with the department and made a part hereof and specifically described as follows:

For the construction of a solid sulfur ship unloading and storage facility consisting of a dockside traveling gantry equipped with a tight-lipped clamshell bucket, a dockside receiving hopper; conveyor belts, a storage building, front-end loaders, a reloading hopper, a load-out conveyor belt, a surge bin for truck loading, and a water spray system.

Construction shall be in accordance with the attached permit application unless otherwise stated in the general and specific conditions herein.

Attachments are as follows:

1. Agrico Chemical Company's permit modification application, DER form 17-1.202(1) dated October 12, 1984.

2. DER's response letter dated October 25, 1984.

3. Agrico's Air Quality Impact Analysis dated May 6, 1985.

4. Agrico's Storage Building Plans dated June 17, 1985.

PERMITTEE:
Agrico Chemical Company

Permit Number: AC 29-5954
Expiration Date: April 1, 1988

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 Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is hereby placed on notice that the department will review this permit periodically and may initiate enforcement 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 applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the department.

3. As provided in Subsections 403.087(6) and 403.722(5), 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. This permit does not constitute a waiver of or approval of any other department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute state recognition or acknowledgement of title, and does not constitute authority for the use 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.

5. 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, unless specifically authorized by an order from the department.

GENERAL CONDITIONS:

6. The permittee shall at all times properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by department rules.

7. The permittee, by accepting this permit, specifically agrees to allow authorized department personnel, upon presentation of credentials or other documents as may be required by law, access to the premises, at reasonable times, where the permitted activity is located or conducted for the purpose of:

a. Having access to and copying any records that must be kept under the conditions of the permit;

b. Inspecting the facility, equipment, practices, or operations regulated or required under this permit; and

c. Sampling or monitoring any substances or parameters at any location reasonably necessary to assure compliance with this permit or department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. 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 noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance.

GENERAL CONDITIONS:

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.

9. 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 Sections 403.73 and 403.111, Florida Statutes.

10. The 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.

11. This permit is transferable only upon department approval in accordance with Florida Administrative Code Rules 17-4.12 and 17-30.30, as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the department.

12. This permit is required to be kept at the work site of the permitted activity during the entire period of construction or operation.

13. This permit also constitutes:

( ) Determination of Best Available Control Technology (BACT)
( ) Determination of Prevention of Significant Deterioration (PSD)
( ) Compliance with New Source Performance Standards.

14. The permittee shall comply with the following monitoring and record keeping requirements:

a. Upon request, the permittee shall furnish all records and plans required under department rules. The retention period for all records will be extended automatically, unless otherwise stipulated by the department, during the course of any unresolved enforcement action.

GENERAL CONDITIONS:

b. The permittee shall retain at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation), copies of all reports required by this permit, and records of all data used to complete the application for this permit. The time period of retention shall be at least three years from the date of the sample, measurement, report or application unless otherwise specified by department rule.

c. Records of monitoring information shall include:

- the date, exact place, and time of sampling or measurements;
- the person responsible for performing the sampling or measurements;
- the date(s) analyses were performed;
- the person responsible for performing the analyses;
- the analytical techniques or methods used; and
- the results of such analyses.

15. When requested by the department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the department, such facts or information shall be submitted or corrected promptly.

SPECIFIC CONDITIONS:

1. The Agrico Big Bend sulfur facility shall handle a maximum of 672,000 tons per year (TPY), or 600,000 long tons per year (LTPY), of standard sulfur pellets.

SPECIFIC CONDITIONS:

2. The maximum annual operating hours and rates for the operations at the sulfur facility are summarized below, with regards to material transfer:

	Transfer Operation	Operating Hours	Operating Rates (TPH)
a)	Ship to storage	1000	672
b)	Storage activity	8000	NA
c)	Storage to trucks	8000	84

3. The emissions of particulate matter from the sulfur storage building shall not exceed 1.7 lbs/hr for Agrico's 56,000 ton storage capacity, or 7 TPY.

4. There shall be no visible emissions (5% opacity, six minute average) from any source within the sulfur handling area.

5. All applicable emissions limiting precautions and procedures specified in this permit application, and in Rule 17-2.600(11)(b), FAC, Solid Sulfur Storage and Handling Facilities, shall be followed at all times.

6. No unenclosed sulfur handling operation shall be conducted when wind speed is in excess of 18 mph (five minute average).

7. Construction and operation shall reasonably conform to the information submitted in this application.

8. The following shall be submitted to Central Air Permitting (CAPS) for approval within 90 days after issuance of this construction permit, in accordance with Rule 17-2.540, FAC, and Rule 17-2.600(11)1, FAC, respectively:

(a) A post-construction Air Quality and Sulfur Particulate Deposition Monitoring Plan, which will be in effect for a minimum of two years from the date of issuance of the initial air operating permit.

(b) A detailed marine vessel unloading procedure shall be developed to minimize emissions of sulfur particulate.

SPECIFIC CONDITIONS:

9. The following shall be submitted to Hillsborough County Environmental Protection Commission (HCEPC) and DER's Southwest District office, within 45 days of completion of tests, and a minimum of 90 days before the expiration date of the construction permit, for approval (copy of submittal shall be sent to Central Air Permitting Office, CAPS):

(a) Initial compliance tests reports of the DER Method 5 (Determination of Particulate Emissions from Stationary Sources using liquid impingement) conducted on emissions from the storage building.

(b) Initial compliance test reports of the DER Method 9 (Visual Determination of the Opacity for Emissions from Stationary Sources) for all the sources within the sulfur handling area.

(c) Initial sulfur deposition monitoring report, conducted according to Rule 17-2.753(2), FAC, (DER Reference Method for Monitoring the Deposition of Sulfur Particulate).

10. The applicant shall demonstrate compliance with the conditions of the construction permit and submit a complete application for an operating permit to Hillsborough County Environmental Protection Commission (HCEPC) (Copy to DER Southwest District office and CAPS), a minimum of 90 days prior to the expiration date of the construction permit.

11. Annual compliance tests shall be performed at 90-100% of the permitted operating rates and with a minimum wind speed of 8 mph (five minute average) for DER Method 9.

12. A 15 day prior notification of the compliance testing date(s) shall be given to DER's Southwest District office, Central Air Permitting and HCEPC.

13. A 15 day prior notification shall also be given of the unloading dates of the first three ships, to DER Southwest District office, Central Air Permitting, and HCEPC.

14. Upon obtaining an operating permit, the applicant will be required to submit annual reports on the actual operation and emissions of the source to the DER's Southwest District office and HCEPC.

15. Any significant delay in the construction or completion of this project shall be reported to the DER's Southwest District HCEPC, and CAPS.

PERMITTEE:
Agrico Chemical Company

Permit Number: AC 29-5954
Expiration Date: April 1, 1988

Issued this_____day of_____, 19__

STATE OF FLORIDA DEPARTMENT OF
ENVIRONMENTAL REGULATION

_____
VICTORIA J. TSCHINKEL, Secretary

____ pages attached.

Agrico
ONE OF THE WILLIAMS COMPANIES

DER

DEC 23 1985

BAQM

December 18, 1985
Bureau of Air Quality Management
Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32301

Re: Permit No. AC29-5954

Dear Mr. Fancy:

The following information is being submitted to the Bureau as required by Specific Condition 8 (a) and (b) of the referenced permit:

(1) A post-construction Air Quality and Sulfur Particulate Deposition Monitoring Plan. The proposed monitoring locations are displayed on the attached drawing. The monitoring will follow procedures outlined in 17-2.753(2).

(2) A detailed marine vessel unloading procedure is attached.

Should you require additional information, please contact me.

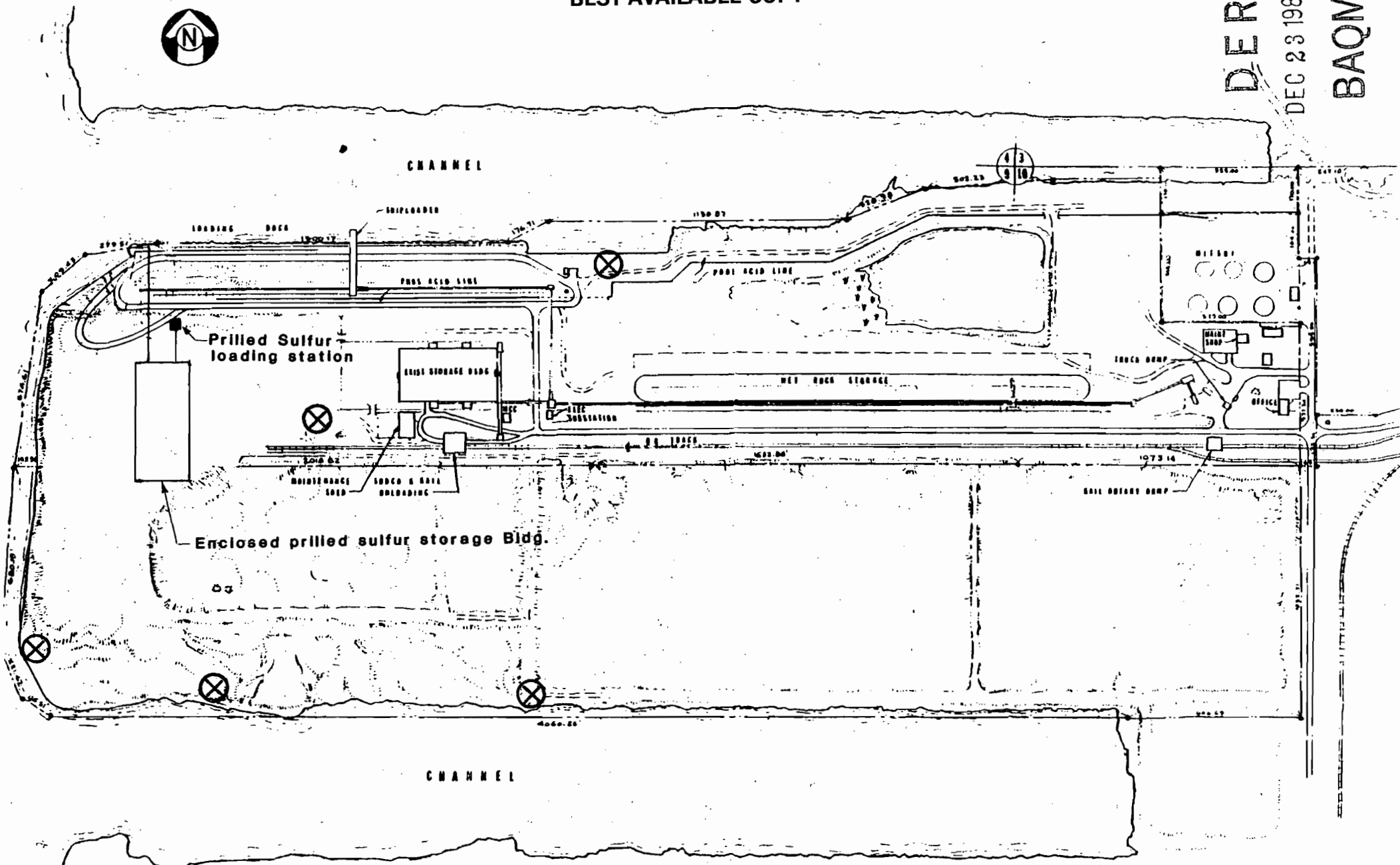
Very truly yours,

H.W. Long Jr.

H.W. Long, Jr.
Manger,
Environmental Control

HWL:crl
attachment
cc: Mr. Vince Snow
Mr. Ed de la Parte
Mr. G.E. D'Aquin

BEST AVAILABLE COPY



DEC 23 1985

D E R

BAQM

⊗ LOCATION OF MODIFIED NIPHER GAUGE

RE: SPECIFIC CONDITION 8(a)

PERMIT No. AC29-5954

AGRICO CHEMICAL COMPANY
BIG BEND TERMINAL

BY	CK'D	DATE	NO	REVISION	BY	CK'D	DATE

	BY	DATE
DESIGNED		
DRAWN	C.E.C.	12-29-39
CHECKED		

PRIDGEN ENGINEERING COMPANY
LAKELAND FLORIDA
DIVISION OF JACOBS ENGINEERING COMPANY

APPROVED	SCALE	ORDER NO
	1" = 200'	28-1048

AGRICO CHEMICAL COMPANY

BIG BEND TERMINAL

MARINE VESSEL UNLOADING PROCEDURE

Re: Specific Condition 8(b)

Permit No. AC29-5954

1. After ship is in position at dock make sure fore and aft lines are secure and hold the ship firmly against breasting fenders.

2. Travel unloading gantry into position over first hold to start discharging.

3. Encircle ship with floating boom and secure.

4. Open first hold to be discharged.

5. Position and secure slope sheet.

6. Proceed with discharging. Make sure all required dockside spray water systems are operating. Clamshell load of sulfur shall not exceed 75% of bucket capacity. Clamshell bucket shall be positioned within the wind walls prior to discharging sulfur into the receiving hopper, drop should not exceed five feet. Clamshell bucket shall be closed completely before being withdrawn from the receiving hopper and returned to the marine vessel. All marine vessel unloading will cease if windspeed exceeds 18 MPH for any five (5) minute period. Unloading will restart when windspeed is at or below 18MPH for a period less than five (5) minutes.

7. Position and secure slope sheet at each hold as discharging proceeds.

8. After discharging is completed any spillage on deck or dock will be cleaned up and placed in storage building.

9. Before removing floating boom; vacuum any spillage floating on water. Remove floating boom and store.

Agrico
ONE OF THE WILLIAMS COMPANIES

November 15, 1985

Mr. Clair H. Fancy
Bureau of Air Quality Management
Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32301

Dear Mr. Fancy:

On June 4, 1984 I wrote you a letter requesting an extension of the expiration date of Permit No. AC29-5954. This permit was originally issued February 5, 1982. On October 12, 1984 I filed an amended application to modify this permit. This modified permit was issued October 3, 1985. Because of this action, Agrico withdraws the request of June 4, 1984 for an extension of the expiration date of the original permit issued February 5, 1982.

Very truly yours,

H.W. Long, Jr.
Manager
Environmental Control

HWL:crl
cc: J. D'Aquin
V. Snow
E. de la Parte
D. Williams
I. Choronenko

DER
NOV 21 1985
BAQM

Agrico Mining Company—A Division of Agrico Chemical Company • P. O. Box 1110 • Mulberry, Florida 33860
813/428-1431

Agrico
ONE OF THE WILLIAMS COMPANIES

September 19, 1985

Mr. Bill Thomas
Bureau of Air Quality Management
Department of Environmental Regulation
2652 Executive Center Circle, East
Koger Center, Montgomery Building
Tallahassee, Florida 32301

Dear Bill,

Agrico requested Dave Buff to review and comment on the DER's "Technical Evaluation and Preliminary Determination, Agrico Chemical Company, Big Bend Terminal, Hillsborough County, Florida, Solid Sulfur Handling and Storage Operation, Permit Number: AC-29-5954", issued by the Florida DER on August 13, 1985.

For your information, I have enclosed a copy of Dave's comments on the air model section of this Technical Evaluation.

Very truly yours,

H.W. Long, Jr.
Manager
Environmental Control

HWL:crl
enclosure
cc: Mr. Vince Snow
Mr. Ed de la Parte

DER
SEP 23 1985
BAQM

KBN

DER

SEP 23 1985

BAQM

September 13, 1985

Mr. Edward P. de la Parte
de la Parte, Gilbert, and Gramovot, P.A.
705 East Kennedy Boulevard
Tampa, FL 33602-5011

RE: Agrico Big Bend Sulfur Air Quality Permit

Dear Ed:

On behalf of Agrico Chemical Company, the following comments are provided related to the concentration values contained in Table 6 and 7 of the "Technical Evaluation and Preliminary Determination, Agrico Chemical Company, Big Bend Terminal, Hillsborough County, Florida, Solid Sulfur Handling and Storage Operation, Permit Number: AC 29-5954", issued by the Florida DER on August 13, 1985. I have reviewed the DER report and I also talked with Mr. Tom Rogers (modeler) of DER's staff.

The concentration values listed in the DER's Technical Evaluation, Tables 6 and 7 (attached), for the maximum impacts due to the proposed sulfur facility only and all Agrico sources, are the same values listed in the revised Table 4-1 of ESE's impact analysis report (letter revision to DER dated July 10, 1985). These values are:

Sulfur facility only:	24-hour - 8.2 ug/m^3
	Annual average - 1.2 ug/m^3
All Agrico sources:	24-hour - 30.9 ug/m^3
	Annual average - 1.9 ug/m^3

However, the 24-hour maximum impact due to all Agrico sources (30.9 ug/m^3) is from the screening analysis, and does not represent the refined concentration, which is greater. The refined impact, as stated in ESE's July 10 revision, is 31.5 ug/m^3, and this number should have been used in DER's Tables 6 and 7 instead of the 30.9 ug/m^3 concentration.

The second comment relates to the increment consumption values shown in Table 6 of the DER report. The values for "total increment consumption"

KBN ENGINEERING AND APPLIED SCIENCES, INC.
P. O. Box 14288 5700 SW 34th Street Gainesville, FL 32604 904/375-8000

represent the total impacts due to all Agrico sources. These concentrations overestimate total increment consumption due to the following factors:

1. Four of the Agrico sources included in the modeling study were permitted or operating before the baseline date and do not consume PSD increments.

2. There have been major reductions in particulate matter emissions since the baseline date from a nearby major emitting source (Gardinier). These reductions would expand the available increment. However, this expansion may be small for the 24-hour averaging time due to meteorological conditions which caused the worst-case Agrico only impacts. These conditions probably would not cause significant interaction between Agrico Big Bend and Gardinier.

3. Although there have been increases in particulate emissions at Tampa Electric Company's (TEC) Big Bend power plant since the baseline date, the impact of these emissions has been demonstrated to be small in the permitting studies for the power plant. In addition, the meteorological conditions causing maximum Agrico only impacts would probably not cause significant interactions with TEC Big Bend.

With these exceptions, the modeling results contained in Tables 6 and 7 of DER's report appear to be consistent with ESE's modeling study of May, 1985 (with letter revision of July, 1985).

Sincerely,

David A. Buff

David A. Buff, P.E.
Principal Engineer

DAB/msb

Enclosures

cc: Ed Mayer
Harold Long

Table 6

PSD Increment Consumption

Maximum Concentrations (ug/m^3)

Pollutant	Averaging Period	Proposed Sulfur Facility Only	Total Increment Consumption	Max. Allowabl Increase
Particulate matter	24-hour	8.2	30.9	37
	Annual	1.2	1.9	19

Table 7

Ambient Air Quality Impacts

Concentrations (ug/m^3)

llutant and eraging Time	Maximum Impact Proposed Facility	Maximum Impact All Agrico Sources	Maximum Impact All Sources	Background	Total Impact	FAAQS
rticulate tter						
24-hour	8.2	30.9	33.1	69	102.1	150
Annual	1.2	1.9	--	40	41.9	60

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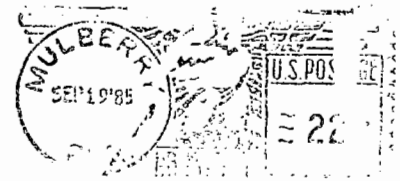

Mr. Bill Thomas
Bureau of Air Quality Management
Department of Environmental Regulation
2652 Executive Center Circle, East
Koger Center, Montgomery Building
Tallahassee, Florida 32301

Agrico
ONE OF THE WILLIAMS COMPANIES

September 6, 1985

Mr. Clair H. Fancy
Bureau of Air Quality Management
Department of Environmental Regulation
2652 Executive Center Circle, East
Koger Center, Montgomery Building
Tallahassee, Florida 32301

Dear Mr. Fancy:

Re: Agrico Chemical Company's Request
to Renew Air Permit No. AC-29-5954

Please find enclosed an executed Waiver of 90-Day Time Limit Under Sections 120.60(2) and 403.0876, Florida Statutes form for the above-referenced permit proceedings.

Without waiving its rights in that proceeding, Agrico has decided to extend the permit review time limit from September 23, 1985 to October 8, 1985. This additional time will allow the Department an opportunity to review an air construction permit modification application, which Agrico Chemical Company has filed.

If you have any questions, please feel free to call.

Very truly yours,

H.W. Long, Jr.
Manager, Environmental Control

HWL:crl
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813/428-1431

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

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

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

WAIVER OF 90 DAY TIME LIMIT
UNDER SECTIONS 120.60(2) AND 403.0876, FLORIDA STATUTES

License (Permit, Certification) Application No. AC 29-5954*

Applicant's Name: Agrico Chemical Company

The undersigned has read Sections 120.60(2) and 403.0876, Florida Statutes, and fully understands the applicant's rights under that section.

With regard to the above reference license (permit, ~~certification~~) application, the applicant hereby with full knowledge and understanding of (~~his~~) (~~her~~) (its) rights under Sections 120.60(2) and 403.0876, Florida Statutes, waives the right under Sections 120.60(2) and 403.0876, Florida Statutes, to have the application approved or denied by the State of Florida Department of Environmental Regulation within the 90 day time period prescribed in Sections 120.60(2) and 403.0876, Florida Statutes. Said waiver is made freely and voluntarily by the applicant, is in (his) (her) (its) self-interest, and without any pressure or coercion by anyone employed by the State of Florida Department of Environmental Regulation.

This waiver shall expire on the 8th day of October 1985.

The undersigned is authorized to make this waiver on behalf of the applicant.

*Re Extension Letter to DER--June 4, 1984

Harold W Long Jr
Signature

Harold W. Long, Jr.
Please Type Name of Signee

Sworn to and subscribed before me this 6th day of September 1985.

September 6, 1985
Date

Gloria N. Causey

Notary Public, State of Florida at Large
My Commission Expires Dec. 9, 1987

DER
SEP 12 1985
BAQM

DER Form 17-1.201(8)
Effective November 30, 1982

Section 120.60, Florida Statutes

(2) When an application for a license is made as required by law, the agency shall conduct the proceedings required with reasonable dispatch and with due regard to the rights and privileges of all affected parties or aggrieved persons. Within 30 days after receipt of an application for a license, the agency shall examine the application, notify the applicant of any apparent errors or omissions, and request any additional information the agency is permitted by law to require. Failure to correct an error or omission or to supply additional information shall not be grounds for denial of the license unless the agency timely notified the applicant within this 30 day period. The agency shall notify the applicant if the activity for which he seeks a license is exempt from the licensing requirement and return any tendered application fee within 30 days after receipt of the original application or within 10 days after receipt of the timely requested additional information or correction of errors or omissions. Every application for license shall be approved or denied within 90 days after receipt of the original application or receipt of the timely requested additional information or correction of errors or omissions unless a shorter period of time for agency action is provided by law. The 90-day or shorter time period shall be tolled by the initiation of a proceeding under Section 120.57 and shall resume 10 days after the recommended order is submitted to the agency and the parties. Any application for a license not approved or denied within the 90-day period or shorter time period, within 15 days after conclusion of a public hearing held on the application, or within 45 days after the recommended order is submitted to the agency and the parties, whichever is latest, shall be deemed approved and, subject to the satisfactory completion of an examination, if required as prerequisite to licensure, the license shall be issued. The Public Service Commission, when issuing a license, and any other agency, if specifically exempted by law, shall be exempt from the time limitations within this subsection. Each agency, upon issuing or denying a license, shall state with particularity the grounds or basis for the issuance or denial of same, except where issuance is a ministerial act. On denial of a license application on which there has been no hearing, the denying agency shall inform the applicant of any right to a hearing pursuant to Section 120.57.

Section 403.0876, Florida Statutes

Permits; processing. ---Within 30 days after receipt of an application for a permit under this chapter, the department shall review the application and shall request submittal of all additional information the department is permitted by law to require. If the applicant believes any departmental request for additional information is not authorized by law or departmental rule, the applicant may request a hearing pursuant to s. 120.57. Within 30 days after receipt of such additional information, the department shall review it and may request only that information needed to clarify such additional information or to answer new questions raised by or directly related to such additional information. If the applicant believes the request of the department for such additional information is not authorized by law or departmental rule, the department, at the aplicant's request, shall proceed to process the permit application. Permits shall be approved or denied within 90 days after receipt of the original application, the last item of timely requested additional material, or the applicant's written request to begin processing the permit application.

Agrico
ONE OF THE WILLIAMS COMPANIES

September 6, 1985

Mr. Clair H. Fancy
Bureau of Air Quality Management
Department of Environmental Regulation
2652 Executive Center Circle, East
Koger Center, Montgomery Building
Tallahassee, Florida 32301

Dear Mr. Fancy:

Re: Agrico Chemical Company's Request
to Modify Air Permit No. AC-29-5954

Please find enclosed an executed Waiver of 90-Day Time Limit Under Sections 120.60(2) and 403.0876, Florida Statutes form for the above-referenced permit proceedings.

Without waiving its rights in that proceeding, Agrico has decided to extend the permit review time limit to October 8, 1985. This additional time will allow the Department an opportunity to review the air construction permit modification application, which Agrico Chemical Company has filed.

If you have any questions, please feel free to call.

Very truly yours,

H.W. Long

H.W. Long, Jr.
Manager, Environmental Control

HWL:crl
enclosure

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STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

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

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

WAIVER OF 90 DAY TIME LIMIT
UNDER SECTIONS 120.60(2) AND 403.0876, FLORIDA STATUTES

License (Permit, Certification) Application No. AC 29-5954 Modification*

Applicant's Name: Agrico Chemical Company

The undersigned has read Sections 120.60(2) and 403.0876, Florida Statutes, and fully understands the applicant's rights under that section.

With regard to the above reference license (permit, ~~certification~~) application, the applicant hereby with full knowledge and understanding of (~~his~~) (~~her~~) (its) rights under Sections 120.60(2) and 403.0876, Florida Statutes, waives the right under Sections 120.60(2) and 403.0876, Florida Statutes, to have the application approved or denied by the State of Florida Department of Environmental Regulation within the 90 day time period prescribed in Sections 120.60(2) and 403.0876, Florida Statutes. Said waiver is made freely and voluntarily by the applicant, is in (his) (her) (its) self-interest, and without any pressure or coercion by anyone employed by the State of Florida Department of Environmental Regulation.

This waiver shall expire on the 8th day of October 1985.

The undersigned is authorized to make this waiver on behalf of the applicant.

*Submitted October 12, 1984

Harold W Long Jr.
Signature

Harold W. Long, Jr.
Please Type Name of Signee

September 6, 1985
Date

Sworn to and subscribed before me this 6th day of September 1985.

Gloria M. Asanza
Notary Public State of Florida at Large
My Commission Expires Dec. 9, 1987

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DER Form 17-1.201(8)
Effective November 30, 1982

Section 120.60, Florida Statutes

(2) When an application for a license is made as required by law, the agency shall conduct the proceedings required with reasonable dispatch and with due regard to the rights and privileges of all affected parties or aggrieved persons. Within 30 days after receipt of an application for a license, the agency shall examine the application, notify the applicant of any apparent errors or omissions, and request any additional information the agency is permitted by law to require. Failure to correct an error or omission or to supply additional information shall not be grounds for denial of the license unless the agency timely notified the applicant within this 30 day period. The agency shall notify the applicant if the activity for which he seeks a license is exempt from the licensing requirement and return any tendered application fee within 30 days after receipt of the original application or within 10 days after receipt of the timely requested additional information or correction of errors or omissions. Every application for license shall be approved or denied within 90 days after receipt of the original application or receipt of the timely requested additional information or correction of errors or omissions unless a shorter period of time for agency action is provided by law. The 90-day or shorter time period shall be tolled by the initiation of a proceeding under Section 120.57 and shall resume 10 days after the recommended order is submitted to the agency and the parties. Any application for a license not approved or denied within the 90-day period or shorter time period, within 15 days after conclusion of a public hearing held on the application, or within 45 days after the recommended order is submitted to the agency and the parties, whichever is latest, shall be deemed approved and, subject to the satisfactory completion of an examination, if required as prerequisite to licensure, the license shall be issued. The Public Service Commission, when issuing a license, and any other agency, if specifically exempted by law, shall be exempt from the time limitations within this subsection. Each agency, upon issuing or denying a license, shall state with particularity the grounds or basis for the issuance or denial of same, except where issuance is a ministerial act. On denial of a license application on which there has been no hearing, the denying agency shall inform the applicant of any right to a hearing pursuant to Section 120.57.

Section 403.0876, Florida Statutes

Permits; processing. ---Within 30 days after receipt of an application for a permit under this chapter, the department shall review the application and shall request submittal of all additional information the department is permitted by law to require. If the applicant believes any departmental request for additional information is not authorized by law or departmental rule, the applicant may request a hearing pursuant to s. 120.57. Within 30 days after receipt of such additional information, the department shall review it and may request only that information needed to clarify such additional information or to answer new questions raised by or directly related to such additional information. If the applicant believes the request of the department for such additional information is not authorized by law or departmental rule, the department, at the aplicant's request, shall proceed to process the permit application. Permits shall be approved or denied within 90 days after receipt of the original application, the last item of timely requested additional material, or the applicant's written request to begin processing the permit application.

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Mr. Clair H. Fancy
Bureau of Air Quality Management
Department of Environmental Regulation
2652 Executive Center Circle, East
Koger Center, Montgomery Building
Tallahassee, FL 32301

Agrico
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August 14, 1985

Mr. Steven Smallwood,
Bureau Chief,
Bureau of Air Quality Management
Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32301

Dear Mr. Smallwood:

We understand that correspondence relating to sulfur or sulfur permitting has been received by your office of which we have not received copies. We are requesting your assistance in receiving copies of such correspondence and that it be forwarded to the following persons:

(1) Mr. Vincent A. Snow
Engineering Manager
Agrico Chemical Company
South Pierce Chemical Works
P. O. Box 1969
Bartow, Florida 33830

(2) Mr. Edward de la Parte, Jr.
de la Parte & Gilbert, P.A.
705 E. Kennedy Blvd.
Tampa, Florida 33602-5011

Please bill any copying charges and/or labor costs to my attention at South Pierce Chemical Works. I will arrange prompt remittance.

Your assistance in this matter will be greatly appreciated.

Sincerely,

Edward E. Mayer,
Environmental Engineer

EEM/lgm

DER
AUG 19 1985
BAQM

Agrico Chemical Company • South Pierce Chemical Works • P. O. Box 1969, Hwy. 630 • Bartow, Florida 33830
(813) 428-1423

Agrico
ONE OF THE WILLIAMS COMPANIES

June 14, 1985

DER
JUN 17 1985
BAQM

Mr. William A. Thomas, P.E.
Bureau of Air Quality Management
Department of Environmental Regulation
Montgomery Building
2670 Executive Center Circle West
Tallahassee, Florida 32301

Dear Mr. Thomas:

Attached please find a copy of the preliminary drawings of the Big Bend Sulfur Storage Building as recently discussed with Harold Long. These drawings were presented to Ed Huck in a meeting last April.

If you have any questions, please feel free to contact either Vince Snow or myself at 813-428-1423.

Yours truly,

Ed Mayer

Ed Mayer

EM/ab

Agrico Chemical Company • South Pierce Chemical Works • P. O. Box 1969, Hwy. 630 • Bartow, Florida 33830
(813) 428-1423

AIR QUALITY ASSESSMENT OF THE PROPOSED BIG BEND PRILLED SULFUR TERMINAL

Prepared for:

DE LA PARTE AND GILBERT, P.A.

Regarding:

DER PERMIT NO. AC 29-5954
AGRICO CHEMICAL COMPANY'S PRILLED SULFUR
SHIP UNLOADING AND STORAGE INSTALLATION
BIG BEND TERMINAL
Hillsborough County, Florida

Prepared by:

ENVIRONMENTAL SCIENCE AND ENGINEERING, INC.
Gainesville, Florida

May 1985

ESE No. 84-148-0102-2110

AIR QUALITY ASSESSMENT OF THE PROPOSED BIG BEND PRILLED SULFUR TERMINAL

Prepared for:

DE LA PARTE AND GILBERT, P.A.

Regarding:

DER PERMIT NO. AC 29-5954
AGRICO CHEMICAL COMPANY'S PRILLED SULFUR
SHIP UNLOADING AND STORAGE INSTALLATION
BIG BEND TERMINAL
Hillsborough County, Florida

Prepared by:

ENVIRONMENTAL SCIENCE AND ENGINEERING, INC.
Gainesville, Florida

May 1985

ESE No. 84-148-0102-2110

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levels for nonattainment areas are presented in Table 1-1. In addition, an analysis of sulfur particulate deposition rates expected from the proposed prilled sulfur installation was conducted.

The air quality analysis was based on predicted TSP concentrations using the Industrial Source Complex (ISC) model approved by the U.S. Environmental Protection Agency (EPA) and DER. For addressing the 24-hour average TSP impacts, hourly concentrations were predicted with the short-term version of the model (ISCST) using actual hourly meteorological data collected during a 5-year period by the National Weather Service (NWS) in the Tampa area. A method recommended by EPA for eliminating calm conditions (i.e., no measured wind direction and wind speed less than 3 knots) from the meteorological data base was used to produce valid 24-hour average concentrations. The ISC model may produce unrealistically high concentrations if calm conditions are included in the analysis. Annual average concentrations were determined using the long-term version of the model (ISCLT) with annual average emission rates reflective of the maximum annual hours of operation of each activity.

The sulfur particulate deposition rate analysis was based upon predicting deposition rates using the ISC model. Maximum annual and maximum monthly deposition rates were estimated for the prilled sulfur installation using the ISCLT model. This model is approved by EPA and DER for estimating particulate deposition rates.

The following sections present a description of the facility, the methods used in predicting expected maximum concentrations, and the results of the air quality impact assessment.

Table 1-1. Air Quality Standards for Particulate Matter Applicable to the Proposed Big Bend Prilled Sulfur Terminal

Standard	Concentration ($\mu g/m^3$)	
	Annual Geometric Mean	24-Hour
Florida Ambient Air Quality Standards	60	150*
Significance Limit	1	5

*Not to be exceeded more than once per year.

Sources: Code of Federal Regulations, Title 40, Parts 50, 51, and 52.
DER, 1983.

The maximum allowable emissions for each permitted source associated with this proposed expansion, including DC-1, are given in Table 2-1. Because the maximum allowable PM emissions for the proposed permitted expansion, including DC-1, are more than those for the existing sources (i.e., DC-1 to DC-4), air quality impacts are also expected to be higher for the proposed permitted expansion. As a result, the air quality impact analysis addresses total impacts from the Agrico facility based upon emissions from the proposed permitted expansion and proposed prilled sulfur storage installation.

The proposed prilled sulfur installation will consist of facilities to unload prilled sulfur from a marine vessel, transport to storage, and loadout to trucks. Prilled sulfur will be unloaded by a tight-lipped clamshell from a marine vessel. The prilled sulfur will be dropped into an enclosed hopper and then onto an enclosed belt conveyor, where it will proceed through an additional enclosed transfer point and then to a storage building. Within the storage building, the prilled sulfur will be loaded onto a storage pile. From the storage pile, payloaders will transfer the prilled sulfur onto a conveyor belt, and the conveyor belt will transport the material to the truck-loading building. The sulfur will be transferred to a loading hopper within the truck loading building and then into enclosed trucks for shipment.

The PM emissions from most of the proposed prilled sulfur emission sources are fugitive because they are not vented through a stack or vent. The activities which will result in fugitive and vented emissions and the estimated maximum emissions for each activity are presented in Table 2-2. Emission estimates are presented for both wet-formed and air-formed prilled sulfur and for suspended sulfur particulate emissions (for estimating ambient air quality impacts) and total sulfur particulate emissions (for estimating total sulfur deposition rates). The suspended particulate estimates are considered representative of particulate which

Table 2-1. Maximum Allowable Particulate Matter Emissions for the Proposed Permitted Expansion at Big Bend Terminal

Source*	PM Emissions (lb/hr)	PM Emissions (TPY)
DC-A	15.33	7.95
DC-B	2.30	1.19
DC-C	2.30	1.19
DC-D	2.30	2.38
DC-E	2.30	1.22
DC-F	7.66	6.01
DC-G	2.30	1.19
DC-H	2.30	1.19
SCR-J	6.84	3.60
SCR-K	6.84	3.60
SCR-L	2.30	1.19
DC-A'	9.20	3.68
DC-B'	1.53	0.61
DC-C'	1.53	0.61
DC-D'	1.53	0.61
DC-E'	1.53	0.61
DC-1	5.00	3.57
TOTAL	73.09	40.40

*DC = Dust collector; SCR = Scrubber.

Source: ESE, 1985.

Table 2-2. Maximum Sulfur Particulate Emissions Associated with the Proposed Big Bend Prilled Sulfur Installation

Activity	Suspended Particulate Emissions lb/hr	Suspended Particulate Emissions short TPY	Total Particulate Emissions lb/hr	Total Particulate Emissions short TPY
WET-FORMED PRILL				
Ship to Storage				
Clamshell to hopper	0.056	0.028	0.118	0.059
Hopper to conveyor belt	0.036	0.018	0.076	0.038
Conveyor belt-to-belt transfer	0.036	0.018	0.076	0.038
Conveyor belt to storage pile*	0.605	0.302	0.419	0.209
Storage Pile Activity				
Vehicle traffic*	0.375	1.50	0.260	1.040
Payloader to conveyor belt*	0.0069	0.027	0.0048	0.019
Truck Loadout				
Conveyor belt to receiving bin	0.0045	0.018	0.0095	0.038
Bin dump	0.030	0.121	0.063	0.254
Bin to truck	0.030	0.121	0.063	0.254
TOTAL	1.179	2.153	1.0893	1.949
AIR-FORMED PRILL				
Ship to Storage				
Clamshell to hopper	0.045	0.022	0.095	0.046
Hopper to conveyor belt	0.029	0.015	0.061	0.032
Conveyor belt-to-belt transfer	0.029	0.015	0.061	0.032
Conveyor belt to storage pile*	0.484	0.242	0.335	0.168
Storage Pile Activity				
Vehicle traffic*	0.375	1.50	0.260	1.040
Payloader to conveyor belt*	0.0055	0.022	0.0038	0.015
Truck Loadout				
Conveyor belt to receiving bin	0.0036	0.015	0.0076	0.032
Bin dump	0.024	0.097	0.050	0.204
Bin to truck	0.024	0.097	0.050	0.204
TOTAL	1.019	2.025	0.9234	1.773

*Activities which will occur in the storage building and will be vented.

Sources: ESE, 1985.
Agrico Chemical Company, 1985.

would be collected by the standard high-volume air sampler. They are also considered to be conservative since no effects of gravitational settling and deposition of particulates inside the storage building were considered in developing the suspended particulate emission estimates. The total particulate emission estimates shown in Table 2-2 do include the effects of gravitational settling and deposition inside the storage building. As a result, the total sulfur particulate emissions from the proposed prilled sulfur installation are less than the suspended particulate emissions. The derivation of emission estimates, including supporting data, assumptions, and control efficiencies, are presented in Appendix A.

For estimating maximum 24-hour emissions, the maximum throughput of prilled sulfur for ship-to-storage activities was 672 short tons per hour (TPH). For the pile and loadout activities, the maximum throughput of prilled sulfur was 84 short TPH. For estimating maximum annual emissions, the ship-to-storage activities will occur for a maximum of 1,000 hours per year (hr/yr), whereas the other activities will occur for a maximum of 8,000 hr/yr.

Table 3-1. Summary of Procedures for Estimating Initial Lateral (σ_{yo}) and Vertical (σ_{zo}) Dimensions for Volume Sources

Source Type	σ_{yo}	σ_{zo}
Single, elevated volume source on or adjacent to a building	$\frac{(\text{width} \times \text{length})^{1/2}}{4.3}$	$\frac{\text{building height}}{2.15}$
Single, ground-based volume source	$\frac{(\text{width} \times \text{length})^{1/2}}{4.3}$	$\frac{\text{vertical dimension of source}}{2.15}$
Single, elevated volume source not on or adjacent to a building	$\frac{(\text{width} \times \text{length})^{1/2}}{4.3}$	$\frac{\text{vertical dimension of source}}{4.3}$

Source: Cramer, 1979.

The generalized Briggs (1971, 1975) plume rise equations, including the momentum terms, are used to calculate plume rise as a function of downwind distance. In this study, except for building downwash situations, the final plume rise was used for calculating concentrations at all receptor locations. A wind profile exponent law is used to adjust the observed mean wind speed from the measurement height to the emission height, for the plume rise and concentration calculations. The Pasquill-Gifford (Turner, 1970) dispersion curves are used to calculate the horizontal standard deviation (σ_y) and vertical standard deviation (σ_z) of the plume spread.

As an option, procedures suggested by Huber and Snyder (1976) and Huber (1977) are used to evaluate building downwash effects on plume emitted from point sources. This option modifies the dispersion parameters to account for the increased plume spread produced by turbulent air flow around buildings. As suggested by EPA (1983), when the building downwash option is used, plume rise should be calculated as a function of downwind distance. For the prilled sulfur installation, the building downwash option was used in calculating concentrations due to the modeled point sources. For building downwash, the model represents a building by calculating an area based upon the input building length and width and then calculating the diameter of a circle having the same area. This diameter is then used in all building downwash calculations to represent the average building dimensions.

The ISC model has rural and urban options which affect the wind speed profile exponent law, dispersion rates, and mixing height formulations used in calculating ground-level concentrations. The criteria used to determine when the rural or urban mode is appropriate are based on land use near the proposed plant's surroundings (Auer, 1978). If the land use is classified as heavy industrial, light-moderate industrial, commercial, or compact residential for more than 50 percent of the area within a 3-km radius circle centered on the proposed source, the urban option should be

selected. Otherwise, the rural option is more appropriate. Based upon review of the Gibsonton, Florida, United States Geological Survey quadrangle map (1981) and survey of the Big Bend Terminal area, less than 50 percent of the area within a 3-km radius is utilized as heavy industrial, light moderate industrial, commercial, or compact residential. Therefore, the rural mode was used in calculating ground-level concentrations. This classification is due in part to the location of Tampa Bay adjacent to the Big Bend Terminal.

The ISC model consists of two sets of computer codes which are used to calculate short- and long-term ground-level concentrations. The main differences between the two codes are the input format of the meteorological data and the method of estimating the plume's horizontal dispersion.

The first model code, the ISCST model, is an extended version of the single-source (CRSTER) model (EPA, 1977). The ISCST model is designed to calculate hourly concentrations based on hourly meteorological parameters (i.e., wind direction, wind speed, atmospheric stability, ambient temperature, and mixing heights). The hourly concentrations are processed into nonoverlapping, short-term and annual averaging periods. For example, a 24-hour average concentration is based on twenty-four 1-hour averages calculated from midnight to midnight of each day. For each short-term averaging period selected, the highest and highest, second-highest average concentrations are calculated for each receptor. As an option, a table of the 50 highest concentrations over the entire field of receptors can be produced.

The second model code is the ISCLT model, which is an extension of the Air Quality Display Model (AQDM) and the Climatological Dispersion Model (CDM). The ISCLT model uses joint frequencies of wind direction, wind speed, and atmospheric stability to calculate seasonal and/or annual average ground-level concentrations. Because the input wind directions

are for 16 sectors, with each sector defined as 22.5 degrees, the model calculates concentrations by assuming that the pollutant is uniformly distributed in the horizontal plane within a 22.5-degree sector. For this analysis, the ISCLT model was used to calculate annual average concentrations since the model output produces annual average concentrations.

3.1.2 Particulate Deposition Rate Analysis

Sulfur particulate deposition rates were predicted for the proposed prilled sulfur installation only. The ISCLT model was used for this analysis. The ISCLT model was applied in the same manner as the ambient air quality analysis discussed in Section 3.1.1, except that particulate deposition information was also input into the model. The ISC model accounts for both gravitational settling and dry deposition of particulate matter. As stated in the ISC User's Guide, the effects of gravitational settling are considered in the model (at the user's option) by assuming the plume is tilted, with the plume axis inclined to the horizontal at an angle given by the arctan of $V_s/\bar{u}$, where V_s is the gravitational settling velocity and $\bar{u}$ is the ambient wind speed. For a given source, the total particulate emissions can be separated into a maximum of 20 particle-size categories, for which the mass-mean diameter and settling velocity are calculated. Dry deposition is considered in the analysis by assigning a reflection coefficient for each particle-size category.

The reflection coefficient, which was based on the settling velocity and Figure 2-8 in the ISC User's Guide, is a term used in the ISC model to account for the amount of material that reaches the ground surface by the combined processes of gravitational settling and atmospheric turbulence and is reflected from the surface. A value of 1.0 for the reflection coefficient term assumes that the material is completely reflected from the surface, while a value of 0.0 indicates complete retention or deposition at the surface.

Joint frequencies of wind direction, wind speed, and atmospheric stability were developed on a monthly and annual basis to estimate maximum monthly and annual sulfur particulate deposition rates. The year of meterological data selected for analysis was the year which resulted in the highest annual ambient air quality impact.

3.2 EMISSION INVENTORY

3.2.1 Ambient Air Quality Analysis

For determining impacts on ambient air quality due to the proposed prilled sulfur installation, the suspended particulate emissions presented in Table 2-2 were used as input to the ISC model. The actual physical dimensions associated with the prilled sulfur installation are presented in Table 3-2. The source input parameters considered in the ISC model are presented in Table 3-3. The actual physical dimensions of the proposed source configuration were based on the physical layout of the building or structure in which the activities occur and reasonable estimates of the initial extent of emission releases. As shown in Table 3-3, most of the fugitive sources were treated as volume sources because the emissions were assumed to be uniformly mixed in a volume of air before dispersing in the atmosphere. Emissions for certain activities were combined because they were assumed to occur over the same area in both horizontal and vertical directions. All of the emissions from activities within the storage building will be emitted through a roof vent in the top of the building. The vent will extend along the entire length of the roof. The vent was represented in the model as three equally spaced point sources located along the roof. For these point sources, concentrations were calculated for building downwash conditions using the initial plume dispersion parameters presented in Table 3-3.

For the proposed permitted expansion, the source parameters for all sources which have dust collectors and scrubbers and received air construction and/or operating permits at the Big Bend terminal are

Table 3-2. Physical Dimensions and Locations of Activities Associated with the Prilled Sulfur Installation

Activity	Location	Emission Release Height (ft)	Activity Dimensions (ft)*	
			Horizontal	Vertical
Clamshell to hopper	Along dockside for ship handling	32-56	34 x 33	24
Hopper to belt	Along dockside for ship handling	4-10	6 x 6	6
Belt to belt	West end of dock-side conveyor	0-25	10 x 10	25
Transfer to storage pile	Storage building	72	600 x 202	72
Payloader dump	Storage building	72	600 x 202	72
Vehicle traffic	Storage building	72	600 x 202	72
Belt transfer to bin	Truck loadout building	15-65	16 x 25	50
Bin dump	Truck loadout building	15-65	16 x 25	50
Bin to truck	Truck loadout building	0-15	16 x 25	15

*Based on structure in which activity occurs.

Source: ESE, 1985.

Table 3-3. Model Inputs of Emission Sources Associated with the Prilled Sulfur Installation

Modeled Source	Activity	ISC Source Type	UTM Coordinates (km) East	UTM Coordinates (km) North	Source Dimensions (ft) Height	Source Dimensions (ft) Horizontal	Source Dimensions (ft) Vertical	Source Dimensions (ft) Diameter	Initial Plume Dispersion (ft) Horizontal	Initial Plume Dispersion (ft) Vertical
Clamshell to hopper	Clamshell to hopper	Elevated volume**	361.10	3076.39	44	33	24	--	7.7	5.6
Hopper to belt	Hopper to belt	Elevated volume**	361.10	3076.39	7	6	6	--	1.4	1.4
Belt to belt	Belt to belt	Ground-based volume	361.01	3076.39	12.5	10	25	--	2.3	11.6
Storage building	Transfer to pile, pay-loader dump, and vehicle traffic	Point	361.01	3076.10	72	--	--	3.3*	348†	72††
		Point	361.01	3076.14	72	--	--	3.3*	348†	72††
		Point	361.01	3076.18	72	--	--	3.3*	348†	72††
Truck loadout building	Belt to bin, bin dump	Elevated volume	361.045	3076.3	40	20	50	--	4.7	23.3
Truck loadout building	Bin to truck	Ground-based volume	361.045	3076.3	7.5	20	15	--	4.7	7.0

*Minimal exit velocity of 0.1 m/s assumed to result in conservative estimates of concentration and deposition.
†The building dimensions are 600 ft x 202 ft (121,200 ft^2), and a length and width of 308.4 ft was input to the model, which the model simulates as 348 ft ($D = \sqrt{4A/\pi}$).
**Not on or adjacent to a building; all other volume sources are assumed to be on or adjacent to a building.
††Vertical dimension represents building or structure vertical extent.

Source: ESE, 1985.

presented in Table 3-4. The maximum allowable PM emissions for these sources are presented in Table 2-1. All sources at the existing terminal will be permitted to operate 24 hours per day but limited on annual hours of operation. Also, during a 24-hour period, all sources will not operate because the proposed expansion facility will transfer either dry phosphate rock or granular fertilizer. Based upon previous modeling analysis (ESE, 1979), a worstcase emission scenario for the existing permitted sources for a 24-hour period was produced with the following operation: Dry phosphate rock receiving/transfer to silos/transfer to ship/receive granular fertilizer on both systems No. 1 and No. 2. The following dust collectors will be operating for such a situation:

Dust Collectors: A, B, C, G, H, E, F, 1, A', B', C', and D'

Scrubbers: J and K

The short-term modeling evaluation reflected these conditions.

Annual emissions from the proposed permitted expansion, also shown in Table 2-1, are based upon the maximum annual product tonnage throughput and reflect the annual hours of operation each control device is expected to experience. The annual modeling analysis considered all the sources presented in Table 2-1 since each source is expected to operate during the year.

A listing of non-Agrico sources considered in the modeling analyses for determining total air quality impacts is presented in Table 3-5. The emission and stack parameters for these sources were obtained from a previous ESE report prepared for the permit application for Tampa Electric Company (TEC) Big Bend Unit 4 (ESE, 1980) and annual operating reports from Gardinier, Inc. Only these sources were considered in the modeling because, based on previous modeling performed for Agrico (ESE, 1979), these are the only sources which can potentially interact with Agrico sources to produce significant impacts.

Table 3-4. Source Parameters for Existing Permitted Sources at Big Bend Terminal

Source*	UTM Coordinates (km) East	UTM Coordinates (km) North	Stack Height (ft)	Flow Rate (acfm)	Stack Velocity (ft/sec)	Stack Temperature† (°F)	Stack Diameter (ft)
DC-A	362.255	3076.16	125	100,000	41.6	87	7.14
DC-B	362.225	3076.23	75	15,000	42.1	87	2.75
DC-C	362.195	3076.20	75	15,000	42.1	87	2.75
DC-D	361.515	3076.23	45	15,000	42.1	87	2.75
DC-E	361.495	3076.34	45	15,000	42.1	87	2.75
DC-F	361.285	3076.35	75	50,000	42.4	87	5.0
DC-G	362.095	3076.29	75	15,000	42.1	87	2.75
DC-H	361.505	3076.28	60	15,000	42.1	87	2.75
SCR-J	361.825	3076.30	125	30,000	39.8	87	4.0
SCR-K	361.595	3076.30	125	3,000	39.8	87	4.0
DC-L	362.165	3076.19	60	15,000	42.1	87	2.75
DC-A'	361.305	3076.16	125	60,000	42.1	87	5.5
DC-B'	361.345	3076.20	40	10,000	41.9	87	2.25
DC-C'	361.185	3076.18	60	10,000	41.9	87	2.25
DC-D'	361.185	3076.14	130	10,000	41.9	87	2.25
DC-E'	361.425	3076.19	50	10,000	41.9	87	2.25
DC-1	361.445	3076.16	75	4,500	42.9	87	1.49

*DC = dust collector; SCR = scrubber.
†Stack temperature is estimated at 15°F above ambient; Annual average temperature in Tampa is 72°F (30-yr average).

Source: ESE, 1985.

Table 3-5. PM Emissions and Stack Parameters for Non-Agrico Sources Considered in the Modeling

Source	PM Emissions (lb/hr)	Stack Dimensions Height (ft)	Stack Dimensions Diameter (ft)	Exit Gas Conditions Velocity (ft/s)	Exit Gas Conditions Temperature (°F)	UTM Coordinates (km) East	UTM Coordinates (km) North
Tampa Electric Company							
Big Bend Units 1, 2	804	490.0	24.0	94.0	301	361.6	3075.0
Big Bend Unit 3	411	490.0	24.0	47.3	292	361.6	3075.0
Big Bend Unit 4	130	490.0	24.0	65.5	156	361.6	3075.0
Gardinier							
RM5	15.0	66.0	2.0	53.6	141	362.7	3082.7
CIMB3	5.3	65.0	4.0	37.4	91	362.7	3082.7
CIMD3	8.3	68.0	3.5	40.1	104	362.7	3082.7
CIMB4	5.3	65.0	4.0	44.9	89	362.7	3082.7
CIMD4	8.3	68.0	3.5	38.7	106	362.7	3082.6
TSU4	4.5	74.0	4.0	28.2	78	362.6	3082.6
GTSPBF	4.6	87.0	1.1	32.1	150	362.6	3082.5
GTSP	19.5	126.0	8.0	34.1	127	362.6	3082.5
DM1	5.7	90.0	3.8	54.6	140	362.6	3082.5
DM2	5.7	90.0	3.5	61.1	146	362.6	3082.5
DMCN	28.0	55.0	4.3	66.9	118	362.6	3082.5
DM3	5.7	90.0	3.3	61.0	155	362.6	3082.4
DM4	5.7	90.0	3.3	70.9	146	362.6	3082.4
DMCS	23.0	55.0	4.3	73.8	114	362.6	3082.4
DM5	10.0	132.5	7.0	49.1	106	362.6	3082.4
SSF	1.0	40.0	1.7	33.4	120	362.7	3082.5
SSFBF	0.5	32.0	1.3	26.4	96	362.7	3082.5
NH_3	14.6	60.0	8.3	22.5	600	362.6	3082.2
Aux. Boiler	7.1	20.0	4.5	38.4	425	363.1	3082.4
DBFS	1.0	40.0	1.5	36.4	70	362.9	3082.0
DBFW	4.8	30.0	3.5	32.9	81	362.9	3082.1
DBFE	2.2	50.0	2.5	30.1	95	362.9	3082.1

Source: ESE, 1985.

To reduce the amount of computation time required to model the Agrico and non-Agrico sources, the modeling was performed in screening and refined phases. In the screening phase, combinations of sources with similar stack heights and parameters for treatment as one stack was considered. The combined sources at Agrico and Gardinier are listed in Tables 3-6 and 3-7, respectively. The TEC Big Bend sources were not combined. After the screening modeling was performed and worst-case meteorological periods identified, a refined analysis was performed which included individual Agrico sources at their actual existing or proposed locations. Since the screening analysis indicated that the maximum predicted concentrations were due to Agrico sources alone, the Gardinier sources were combined for the refined analysis as well.

3.2.2 Particulate Deposition Rate Analysis

The emission inventory used in the sulfur particulate deposition rate impact analysis was the same as described in Section 3.2.1 for the prilled sulfur installation, except that the estimated emissions for each source were the total particulate emission shown in Table 2-2. The derivation of these emissions is presented in Appendix A.

Several other input parameters to the ISC must be specified for each source, as described in Section 3.1.2. These parameters are shown in Table 3-8, and their derivations are presented in Appendix A.

3.3 METEOROLOGICAL DATA

Meteorological data used in the ISC model to determine air quality impacts consisted of a 5-year period (1974, 1975, 1978, 1979, and 1981) of hourly surface weather observations from the NWS station in Tampa, Florida, and upper air observations from Ruskin, Florida. Meteorological data from these stations were used because they are considered representative of the plant site's conditions due to the NWS station's proximity to the plant site and similar surrounding topographical features at the plant site.

Table 3-6. Combined Sources for Agrico's Permitted Expansion Used in the Screening Analysis

Source*	UTM Coordinates (km) East	North	Stack Height (ft)	Velocity (f/s)	Temperature (°F)	Stack Diameter (ft)	Emissions (lb/hr)
DC-A	362.255	3076.16	125	41.6	87	7.14	15.33
DC-B, C, G	362.195 (C Location)	3076.20	75	42.1	87	2.75	6.9
SCR-J	361.825	3076.30	125	39.8	87	4.0	6.84
SCR-K	361.595	3076.30	125	39.8	87	4.0	6.84
DC-H, E	361.505 (H Location)	3076.28	60	42.1	87	2.75	4.60
DC-F	361.285	3076.35	75	42.4	87	5.0	7.66
DC-A'	361.305	3076.16	125	42.1	87	5.5	9.20
DC-B', C', D'	361.185 (C' Location)	3076.18	60	41.9	87	2.25	4.59
DC-1	361.445	3076.16	75	42.9	87	1.49	5.0

*DC = dust collector; SCR = scrubber.

Note: L, D, E' not considered in the worst case.

Source: ESE, 1985.

Table 3-7. Gardinier Sources Combined for Model Input

Source	PM Emissions (lb/hr)	Stack Dimensions		Exit Gas Conditions		UTM Coordinates (km)	
		Height (ft)	Diameter (ft)	Velocity (ft/s)	Temperature (°F)	East	North
DM1-DM4	22.8	90.0	3.5	62.0	147	362.6	3082.5
RM5	15.0	66.0	2.0	53.6	141	362.7	3082.7
CIMB3, CIMD3, CIMB4, CIMD4, TSU4, GTSPBF	36.1	68.0	3.8	37.9	94	362.7	3082.6
GTSP	19.5	126.0	8.0	34.1	127	362.6	3082.5
DMCN, DMCS	51.0	55.0	4.3	70.3	116	362.6	3082.5
DM5	10.0	132.5	7.0	49.1	106	362.6	3082.4
NH_3	14.6	60.0	8.3	22.5	600	362.6	3082.2
Aux. Boiler	7.1	20.0	4.5	38.4	425	363.1	3082.4
DBFW	4.8	30.0	3.5	32.9	81	362.9	3082.1
SSF, SSFBF	1.5	36.0	1.5	29.9	108	362.7	3082.5
DBFS, DBFE	3.2	45.0	2.1	31.5	83	362.9	3082.1

Source: ESE, 1985.

Table 3-8. Particle Size Distribution and Settling Velocities for Total Sulfur Particulate Emissions Used in ISC Model

Class	Mass-Median Diameter (microns)	Percent Weight in class	Settling Velocity (cm/s)	Reflection Coefficient
		Non-Storage Building Emissions		
1	2	10	0.013	0.95
2	6	10	0.11	0.90
3	11	10	0.37	0.85
4	18	10	0.98	0.77
5	26	10	2.04	0.70
6	37	10	4.14	0.64
7	52	10	8.14	0.54
8	64	10	11.7	0.45
9	110	10	29.0	0.025
10	160	10	52.0	0.0
		Storage Building Emissions		
1	0.7	10	0.002	1.0
2	1.7	10	0.01	0.95
3	3.0	10	0.03	0.94
4	4.0	10	0.05	0.93
5	5.5	10	0.09	0.92
6	7.0	10	0.15	0.90
7	9.0	10	0.25	0.88
8	11.0	10	0.37	0.85
9	14.0	10	0.59	0.82
10	19.0	10	1.09	0.75

Sources: ESE, 1985.
Agrico Chemical Company, 1985.
Dr. Dale Lundgren, 1985.

Maximum 24-hour average concentrations were calculated using the ISCST model, which calculates hourly ground-level concentrations using hourly meteorological data. The hourly concentrations were processed into sequential, nonoverlapping 24-hour average concentrations. The maximum annual average concentrations were determined using the valid hourly concentrations from the ISCST model.

An integral part of the short-term modeling evaluation was the analysis of calm meteorological conditions, which occurred about 6 percent of the time in the 5-year Tampa meteorological data base. During calm conditions, neither a wind direction nor wind speed is recorded. For such hours, the ISCST model uses the last recorded wind direction and a wind speed of 1 meter per second (m/s) to calculate concentrations and continues these conditions until the next noncalm condition is recorded. The persistence in wind direction caused by calm conditions can cause artificially and unrealistically high concentrations to be predicted by the ISC model.

As part of the analysis to review occurrences of calm meteorological conditions, the post-processing computer program, Calms Processor (CALMPRO), was used to identify the wind direction and wind speed assigned for each hour and to adjust the short-term average concentrations if an hourly average concentration was produced during calm conditions. The CALMPRO program was developed by EPA (1984), and the method used for evaluating the effects of calm conditions is reflective of current EPA modeling policy (EPA, 1983). The following criteria were used to calculate valid 24-hour average concentrations.

1. Valid hourly average concentrations for each receptor were based on any concentration predicted during noncalm conditions.
2. Hours of calm conditions were considered invalid, and concentrations were set to zero for all receptors for that hour.
3. Valid 24-hour average concentrations were calculated by summing concentrations produced during noncalm hours and dividing by the maximum of 18 hours or the number of noncalm hours during the 24-hour period.

The following examples illustrate how this method is used to calculate 24-hour average concentrations when calm conditions occur.

1. If calm conditions occurred for 6 hours, a valid 24-hour average concentration would be calculated using the 18 hours of valid concentrations only (i.e., 18-hour average), which is the minimum number of hours used for determining a 24-hour average concentration. The 6 hours of calm conditions would be eliminated from the data set.
2. If calm conditions occurred for 12 hours, a valid 24-hour average concentration would be calculated based on the summation of concentrations produced by the remaining 12 hours, divided by 18.

Maximum annual average concentrations and monthly and annual average depositions were calculated using the ISCLT model, which calculates concentrations and depositions based on the joint frequencies of wind direction, wind speed, and atmospheric stability for the specific averaging period. The joint frequencies were tabulated using the stability array (STAR) program developed by the National Climatic Center and accepted by the EPA and Florida DER. No adjustments were made to the predicted concentrations for calm conditions.

3.4 RECEPTOR GRID

3.4.1 Ambient Air Quality Analysis

3.4.1.1 Short-Term Analysis--To address the maximum air quality impacts around the Agrico facility, screening and refined phases were considered in the general modeling approach. For the screening phase, concentrations were predicted for one main receptor grid using a limited number of receptors and sources. The locations of the receptors within the grid, shown in Figure 3-1, were based on identifying the areas in which the maximum concentrations would be expected due to Agrico sources only and due to the interaction of the Agrico sources with other major sources of PM (i.e., Gardinier and TEC Big Bend). Because the major

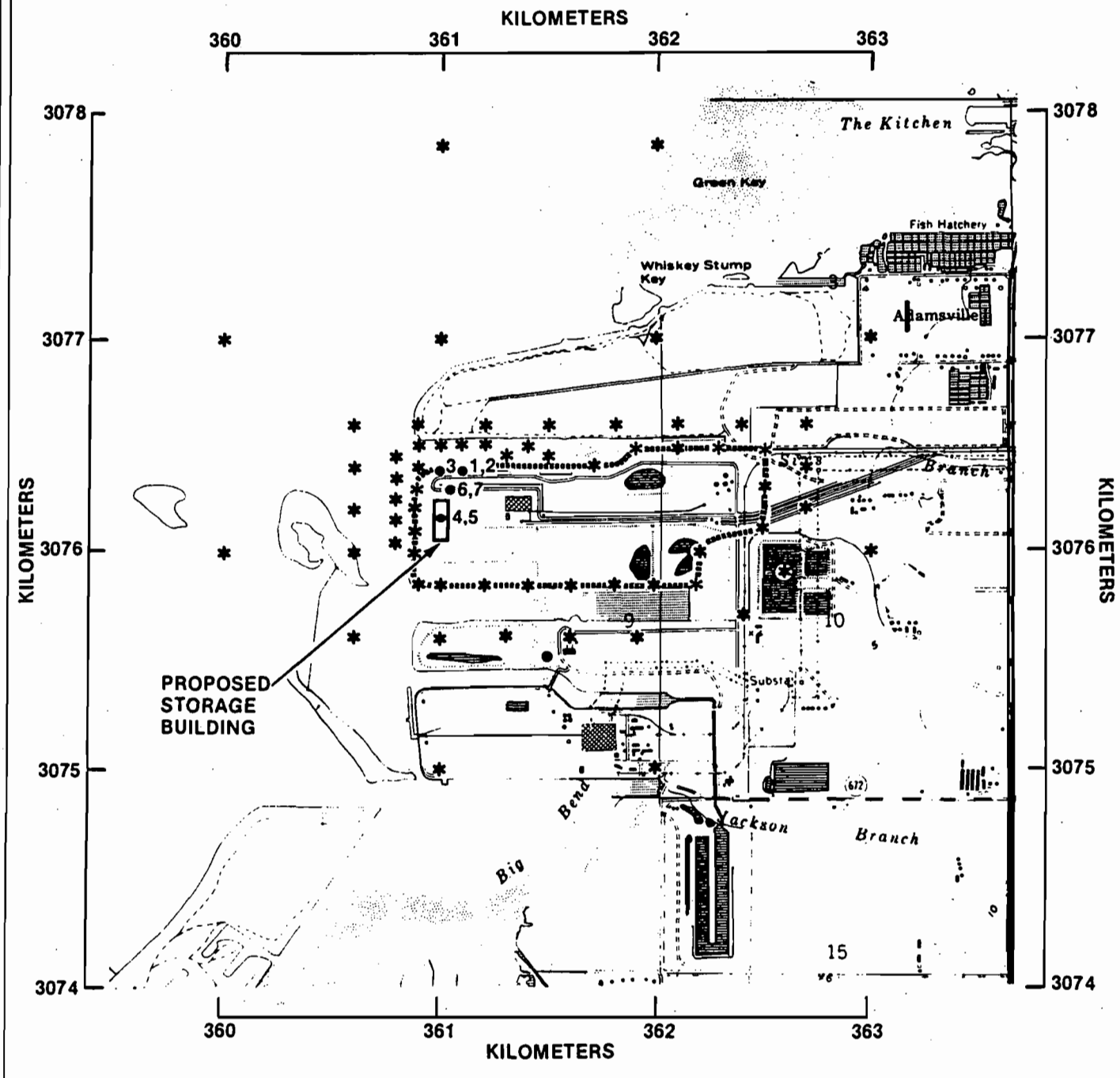


Figure 3-1
RECEPTOR LOCATIONS FOR ESTIMATING MAXIMUM TSP CONCENTRATIONS

SOURCES: USGS, 1981; ESE, 1984.

AGRICO CHEMICAL COMPANY

sources of PM are located in distinct directions from Agrico and are either more than 5 km from the facility (i.e., Gardinier facility) or are not expected to have high impacts during coincident periods when high impacts are predicted for Agrico sources (i.e., TEC Big Bend facility), concentrations were predicted only for directions that aligned the Agrico sources with the other major sources. The receptors and major sources in the analysis are described as follows:

1. Concentrations were predicted for only Agrico sources at the 63 receptors located around the Agrico facility (see Figure 3-1). These receptors were generally spaced at intervals of 200 to 300 meters (m) along the plant boundary lines and within 0.5 km of the facility. The receptor locations were selected because maximum concentrations are expected to occur at or near plant boundaries due to the low-level release characteristics of the volume and point sources. Since the proposed prilled sulfur storage facility will be located in the northwest corner of the Agrico facility, additional receptors were located at approximately 100-m intervals to the north and west of these sources.

   Based on discussions with DER, the receptors were located at a 100 m from the nearest source or at the nearest Agrico plant boundary, whichever was greatest. For volume sources, receptors were located 100 m from the nearest source's center plus 2.15 times the initial horizontal volume dimension of the source, or at the nearest plant boundary, whichever was greatest. This limitation of restricting receptors to be no closer than 100 m from all sources is based on recommendations from the ISC User's Guide, which stipulates that calculated concentrations are not valid within 100 m of a source.

2. Concentrations were predicted for Agrico and Gardinier sources at 17 receptors located south along the western boundary of the

Agrico facility. The receptor locations were obtained from the main receptor grid. Since the Gardinier facility is located approximately 6 km north-northeast of Agrico, the maximum concentrations due to the interaction of the two facilities' emissions are expected to occur south of the Agrico facility. Emissions from the TEC Big Bend facility are not expected to contribute to the maximum concentrations for wind directions from the north that align Agrico sources with Gardinier sources.

3. Concentrations were predicted for Agrico and TEC Big Bend sources at 19 receptors located immediately north of the Agrico facility. The receptor locations were obtained from the main receptor grid. Although the two facilities are located near one another (i.e., TEC Big Bend facility is located approximately 2 km south of the Agrico facility), emissions from the facilities are not expected to interact since Agrico's sources have generally low release heights (i.e., less than 100 ft), whereas the Big Bend facility's stack heights are 490 ft.

For this phase, only emissions for the wet-formed prilled sulfur were considered since emissions for air-formed prilled sulfur were lower, which will result in lower ground-level concentrations.

After the screening phase was completed, the refined modeling was begun by modeling all sources using a refined receptor grid centered on the receptor which had the highest, second-highest 24-hour concentration. The receptors were located at intervals of 100 m in a 200-m by 200-m grid, for a total of nine receptors. Concentrations were predicted for only the period which produced the highest, second-highest 24-hour concentration. For this phase, both emissions for the wet-formed prilled and air-formed prilled sulfurs were modeled since the maximum concentrations for both emission scenarios are expected to occur for the same period and at the same location.

A screening analysis was also performed to address the maximum PM impacts due to the proposed prilled sulfur storage facility in the PM nonattainment area located approximately 5 km to the north. For this analysis, concentrations were predicted for only the proposed storage facility's sources at the following receptor locations:

UTM Coordinates (km)	
East	West
359.5	3080.90
360.0	3080.80
360.5	3080.75
361.0	3080.70
361.5	3080.60
362.0	3080.60
362.5	3080.60
363.0	3080.70

3.4.1.2 Long-Term Analysis--Annual average concentrations were predicted for emissions from both the wet-formed and air-formed prilled sulfurs using the same receptor grid used in the screening analysis for 24-hour concentrations. Refined modeling analysis was not performed for the annual averaging time because the spatial distributions of annual average concentrations are not expected to vary significantly from those produced during the screening analysis. Annual average concentrations were not predicted for the interaction sources (i.e., Gardinier and TEC Big Bend) because their impacts are included in the background concentrations derived from monitoring data used in addressing total air quality impacts from the Agrico sources.

3.4.2 Particulate Deposition Rate Analysis

The receptor grid used in the particulate deposition rate analysis is presented in Figure 3-1, which is the same grid used in the screening phase of the ambient air quality analysis. No refined analysis was performed because monthly or annual average deposition calculations are not expected to vary significantly for the receptor locations modeled.

3.5 BACKGROUND CONCENTRATIONS

Total air quality impacts were estimated by adding the maximum predicted impacts due to the existing permitted and proposed Agrico sources to a background TSP concentration. The background concentration is assumed to represent the concentration from all non-modeled sources.

To determine the background TSP concentration, air quality monitoring data available from DER for 1983 were reviewed for sites near the Agrico facility. Based on this review, two sites were identified within 10 km of the Agrico facility which had more than 75 percent data capture. A summary of the maximum 24-hour and annual average TSP concentrations measured during 1983 at these two sites is presented in Table 3-9. As indicated in Table 3-9, the annual and second-highest 24-hour concentrations at the Eisenhower Junior High School were 33 and 58 micrograms per cubic meter ($\mu g/m^3$), respectively. The annual and second-highest 24-hour concentrations at the Ruskin Fire Station were 31 and 64 $\mu g/m^3$, respectively. For this analysis, the annual and second-highest 24-hour concentrations of 33 and 64 $\mu g/m^3$, respectively, were selected as background concentrations and added to the predicted Agrico plant impacts as a conservative estimate of total air quality impacts.

Since the sulfur particulate deposition analysis addressed deposition due to the proposed prilled sulfur installation only, no background deposition rates were used in the analysis.

Table 3-9. 1983 Measured TSP Monitoring Data in the Agrico Plant Vicinity

Monitoring Site		Location with Respect to Agrico		Monitoring Data			
					Concentration ($\mu g/m^3$)		
					Annual	24-Hr	
Number	Name	Direction (Degrees)	Distance (km)	No. of Observations	(Geometric Mean)	Highest	Second Highest
1800-085	Eisenhower Junior High School	East-Southeast	3	57	33	62	58
1800-003	Ruskin Fire Station	South-Southwest	10	58	31	80	64

Source: ESE, 1985.

4.0 RESULTS

4.1 AMBIENT AIR QUALITY ANALYSIS

Based upon the screening analysis, a summary of the highest, second-highest 24-hour and annual average TSP concentrations due to the proposed Big Bend prilled sulfur installation only and all sources are presented in Table 4-1. Results are presented for both wet-formed prill and air-formed prill. As discussed in Section 3.0, a screening analysis was not performed for air-formed prill emissions, since emissions are similar to the wet-formed prill emissions. For the 5 years of analysis, the highest, second-highest predicted 24-hour TSP concentration due to the proposed prilled sulfur installation only was predicted to occur during 1981 (Day 295). This worst-case day was refined for both wet- and air-formed prill emissions and resulted in concentrations of 8.2 $\mu g/m^3$ and 6.7 $\mu g/m^3$, respectively. These maximum concentrations are both predicted to occur at the northwest property boundary line of the Agrico facility. The spatial distribution of the composite highest, second-highest 24-hour TSP concentrations for the 5 years due to the proposed sulfur installation only is shown in Figure 4-1 for wet-formed prill. The predicted spatial distribution for air-formed prill is similar, but concentrations for air-formed prill would be decreased by a factor of about 0.86 (i.e., ratio of short-term wet-formed to air-formed emissions).

As shown in Table 4-1, the highest, second-highest total 24-hour TSP concentration due to to all sources is predicted to occur in 1978 (Day 166). This worst-case day was refined for both wet- and air-formed prill emissions and resulted in total concentrations of 96.3 $\mu g/m^3$ and 95.9 $\mu g/m^3$, respectively. These concentrations include 32.3 $\mu g/m^3$ and 31.9 $\mu g/m^3$, respectively, due to all Agrico sources, added to a background concentration of 64.0 $\mu g/m^3$. These total 24-hour concentrations are less than 65 percent of the Florida AAQS of 150 $\mu g/m^3$. The background concentration is based on monitoring data (see Section 3.5) and represents concentrations from sources not modeled.

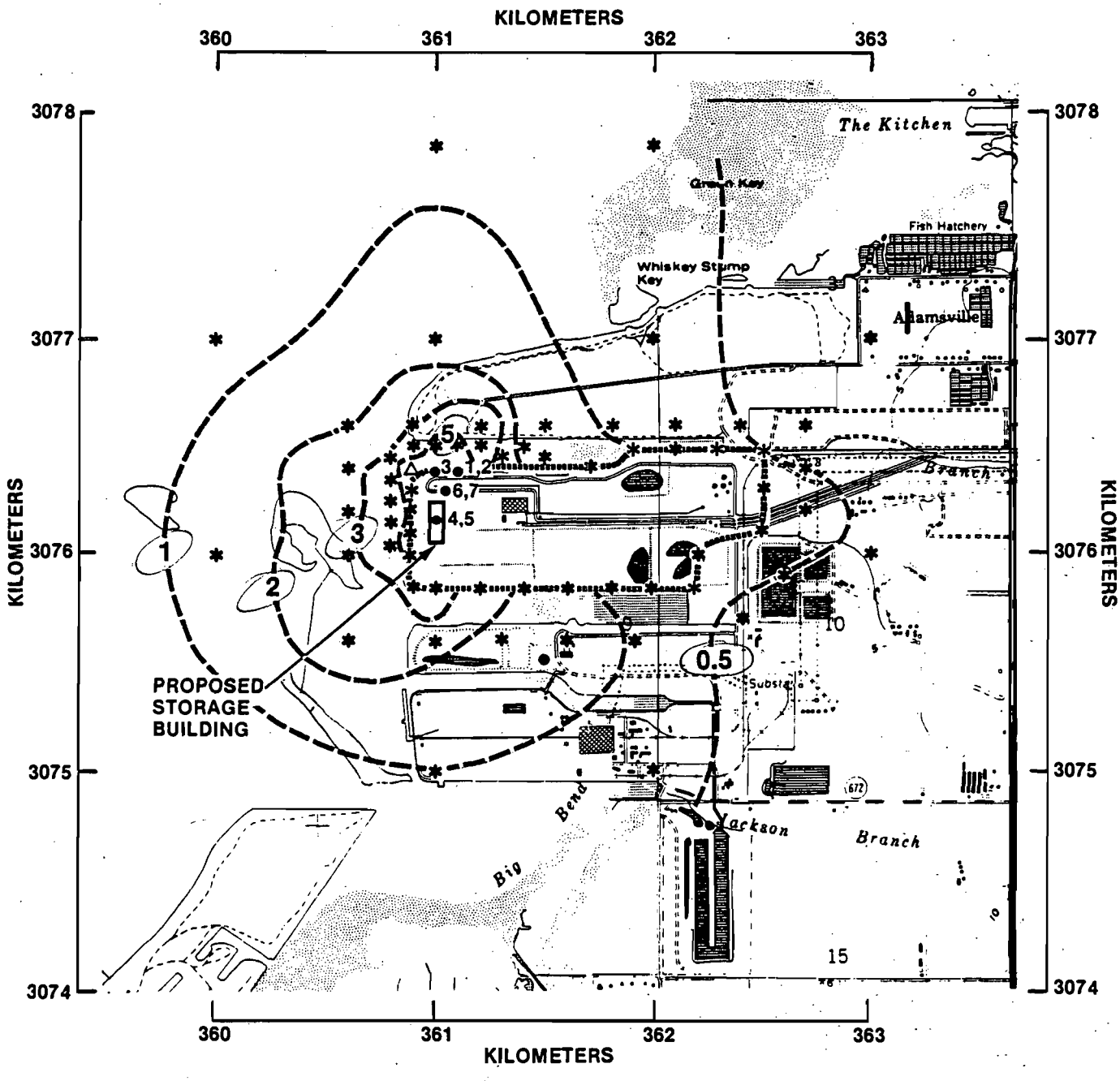
Table 4-1. Predicted Highest, Second-Highest 24-Hour and Maximum Annual Average TSP Concentrations from the Screening Analysis

Averaging Period	Year	Concentration ($\mu g/m^3$) Predicted for: Proposed Sulfur Installation Only	Total	All* Agrico Sources	Background†
		Wet-Formed Prill			
24-Hour	1974	8.0	86.7	22.7	64.0
	1975	5.6	84.0	24.0	64.0
	1978	6.4	93.5	29.5	64.0
	1979	5.5	91.7	27.7	64.0
	1981	8.2	92.8	28.8	64.0
Annual	1974	0.98	34.5	1.5	33.0
	1975	1.08	34.8	1.8	33.0
	1978	1.20	34.9	1.9	33.0
	1979	1.13	34.8	1.8	33.0
	1981	1.16	34.8	1.8	33.0
		Air-Formed Pril			
24-Hour	--	--No screening analysis performed			--
Annual	1974	0.90	34.4	1.4	33.0
	1975	0.92	34.7	1.7	33.0
	1978	1.02	34.7	1.7	33.0
	1979	0.96	34.7	1.7	33.0
	1981	0.98	34.6	1.6	33.0

Note: Florida AAQS: 150 $\mu g/m^3$, 24-hour; 60 $\mu g/m^3$, annual.
Significance Limit: 5 $\mu g/m^3$, 24-hour; 1 $\mu g/m^3$, annual.

*Sources include those for the proposed installation and proposed permitted expansion.
†Based on monitoring data.

Source: ESE, 1985.



KEY
- ---- PLANT SITE BOUNDARY
- * RECEPTOR
- 1 CLAMSHELL-HOPPER
- 2 HOPPER-BELT
- 3 BELT-BELT TRANSFER
- 4 STORAGE BUILDING (VENT)
- 5 STORAGE BUILDING (DOORS)
- 6 TRUCK LOADOUT (BELT TRANSFER, BIN DUMP)
- 7 TRUCK LOADOUT (TO TRUCK)

N

SCALE
0 0.5 1.0 KILOMETERS

△ MAXIMUM CONCENTRATION (8.2 ug/m^3)

Figure 4-1
MAXIMUM 24-HOUR AVERAGE TSP CONCENTRATIONS FOR PROPOSED PRILLED SULFUR INSTALLATION ONLY — WET-FORMED PRILL

SOURCES: USGS, 1981; ESE, 1984.

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The spatial distribution of the composite highest, second-highest 24-hour predicted total concentration for the 5-year period is shown in Figure 4-2 for wet-formed prill. The spatial distribution for air-formed prill is expected to be very similar, with total concentrations somewhat lower than the wet-formed prill concentrations.

The maximum annual average TSP concentration predicted for the proposed sulfur installation only is 1.2 $\mu g/m^3$ for wet-formed prill and 1.0 $\mu g/m^3$ for air-formed prill (see Table 4-1). The maximum predicted total annual average concentration due to all sources is 34.9 $\mu g/m^3$ for wet-formed prill and 34.7 $\mu g/m^3$ for air-formed prill. These maximum concentrations are less than 58 percent of the Florida AAQS of 60 $\mu g/m^3$. The maximum total concentrations are due to the maximum predicted concentration due to all Agrico sources added to a background concentration of 33 $\mu g/m^3$.

The maximum annual average concentrations predicted for both the proposed sulfur installation and all Agrico sources are based on the maximum allowable annual emissions. The spatial distribution of the composite highest annual concentrations due to the proposed sulfur installation only, for wet- and air-formed prill are shown in Figures 4-3 and 4-4, respectively. The spatial distribution of the composite highest annual TSP concentrations due to all sources, including background, are shown in Figures 4-5 and 4-6 for wet- and air-formed prills, respectively.

The total air quality impacts due to Agrico's interaction with Gardinier, Inc., and with TEC Big Bend are presented in Table 4-2. The maximum concentrations from the modeled sources (i.e., Agrico, including the proposed sulfur installation for wet-formed prill only, and Gardinier or TEC Big Bend) are mainly due to impacts predicted for the Agrico sources. Since the proposed sulfur installation emissions are lower for air-formed prill than the wet-formed prill (and, therefore, result in lower concentrations), only a worst-case day analysis was performed for the air-formed prill based on the day that produced the highest, second

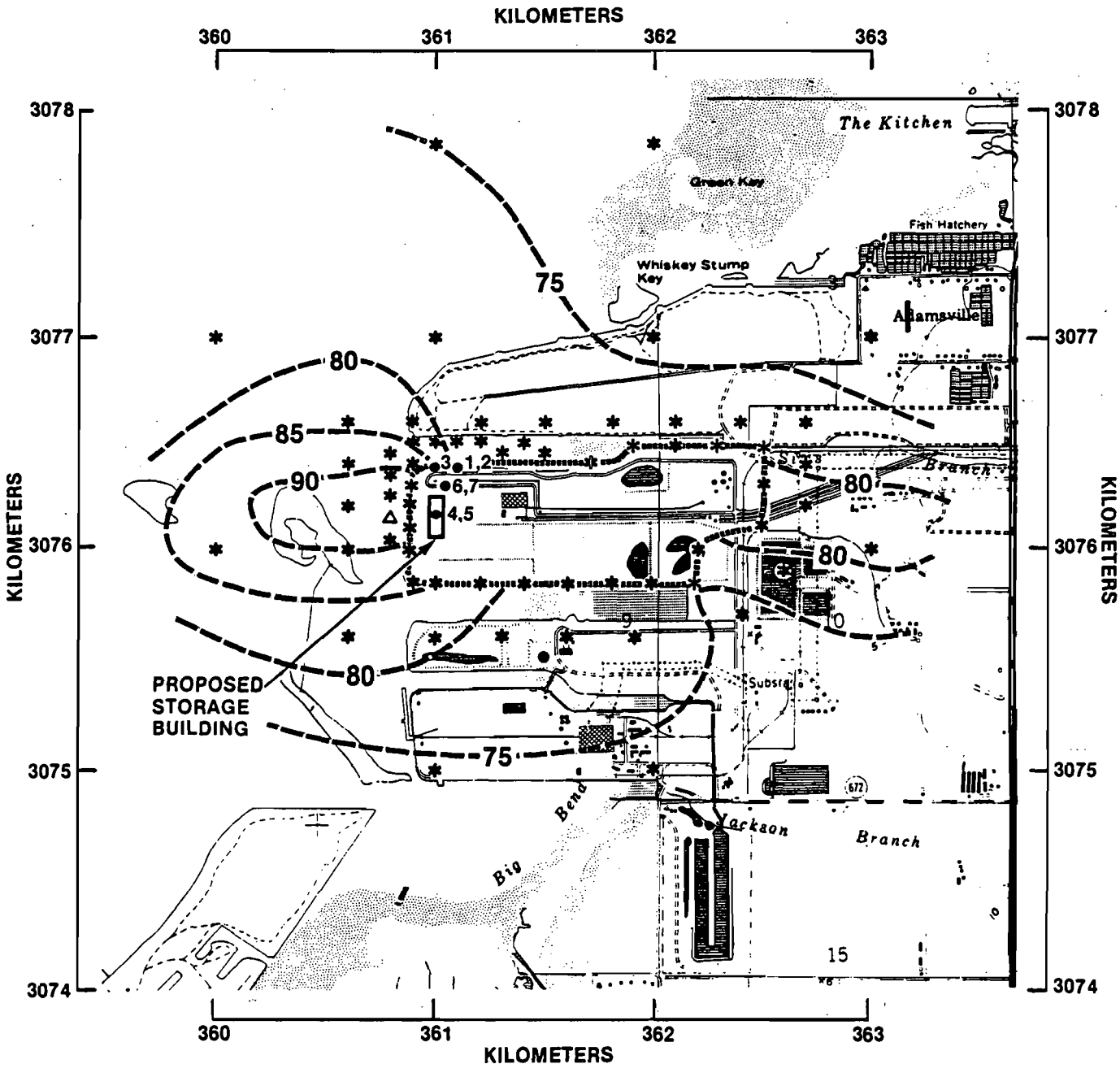

Figure 4-2
MAXIMUM TOTAL 24-HOUR AVERAGE TSP CONCENTRATIONS -- WET-FORMED PRILL

SOURCES: USGS, 1981; ESE, 1984.

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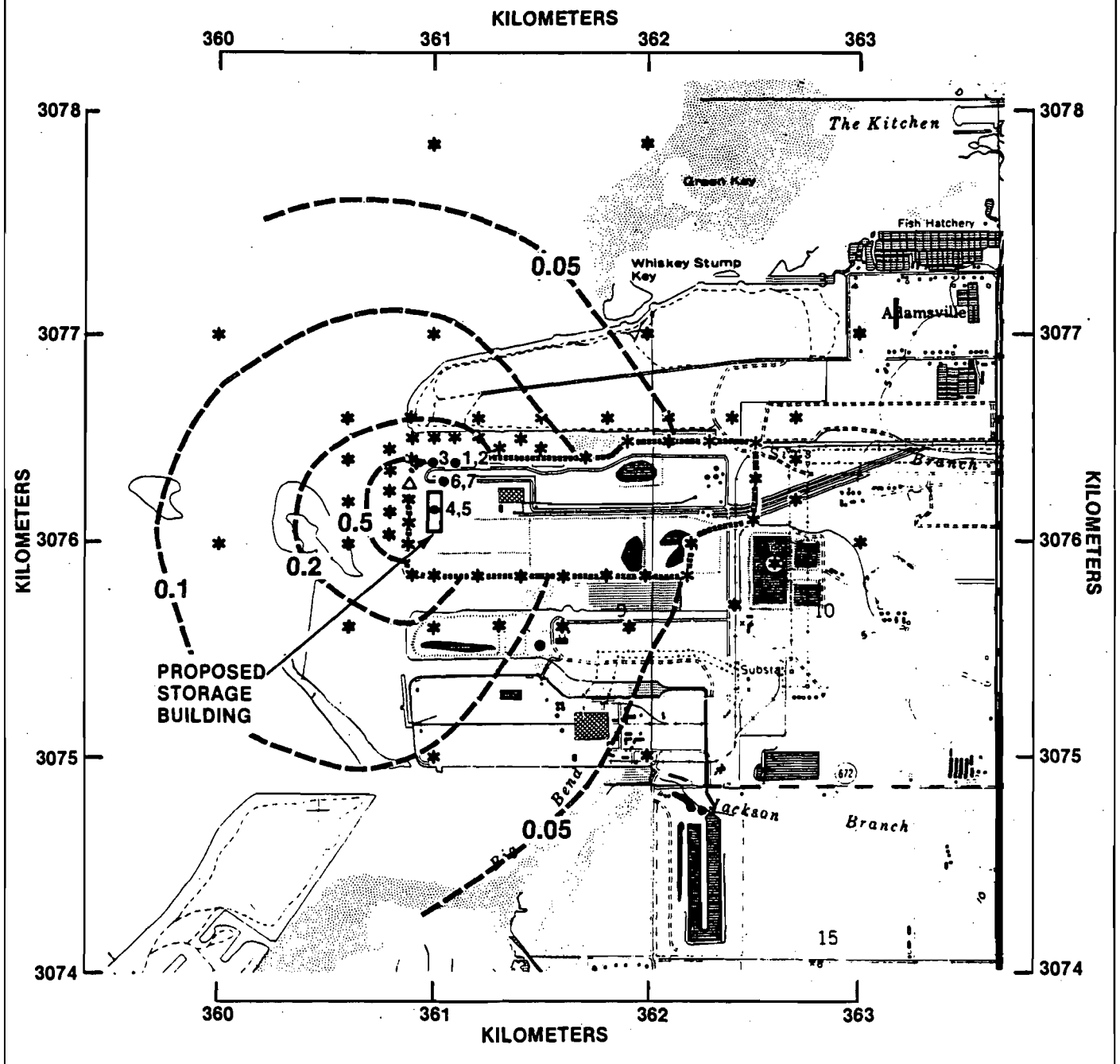


KEY
- PLANT SITE BOUNDARY
- * RECEPTOR
- 1 CLAMSHELL-HOPPER
- 2 HOPPER-BELT
- 3 BELT-BELT TRANSFER
- 4 STORAGE BUILDING (VENT)
- 5 STORAGE BUILDING (DOORS)
- 6 TRUCK LOADOUT (BELT TRANSFER, BIN DUMP)
- 7 TRUCK LOADOUT (TO TRUCK)
- △ MAXIMUM CONCENTRATION (1.2 ug/m^3)

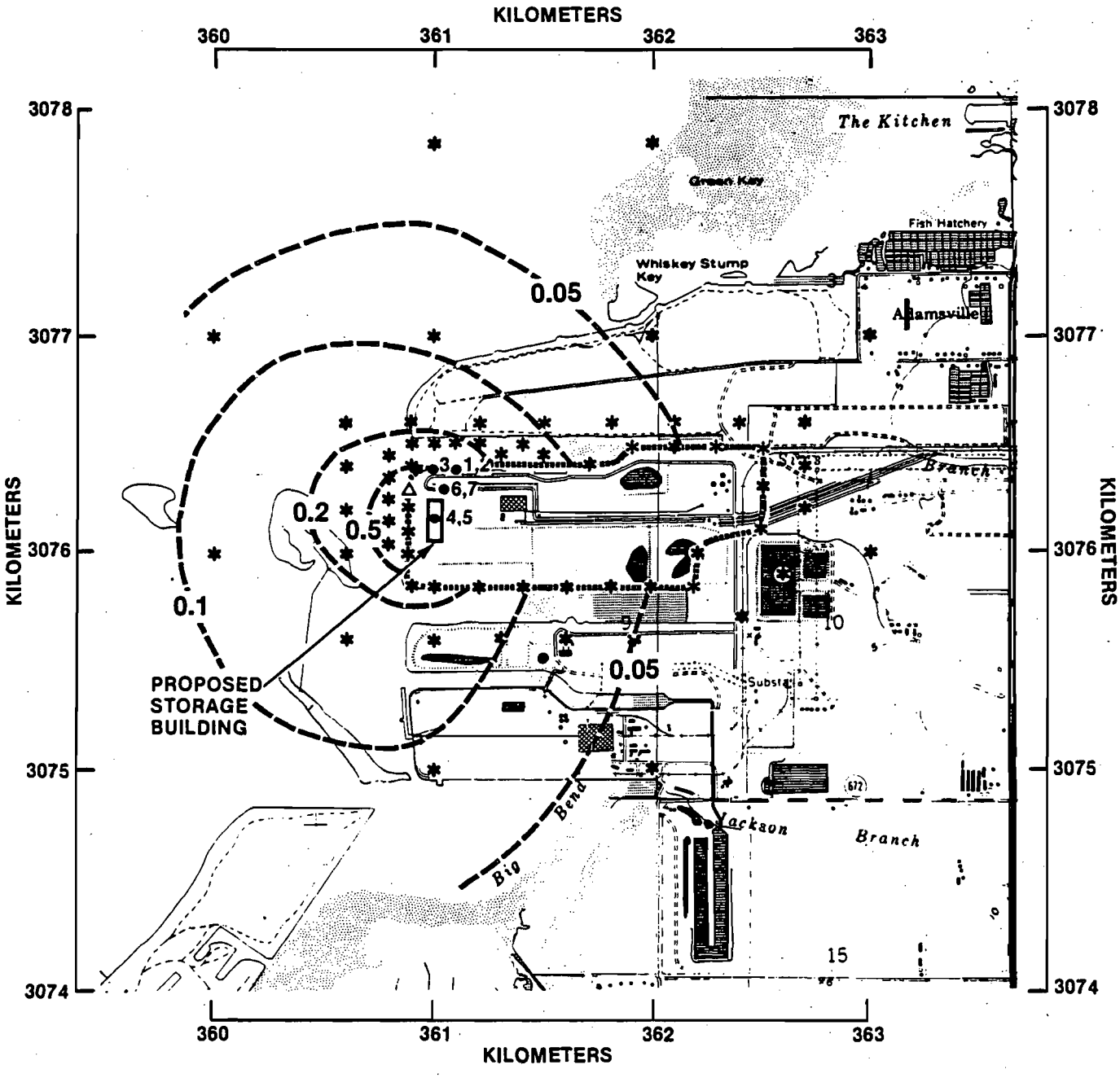
N

SCALE
0 0.5 1.0 KILOMETERS

Figure 4-3
COMPOSITE OF MAXIMUM ANNUAL AVERAGE TSP CONCENTRATIONS (ug/m^3) DUE TO PRILLED SULFUR INSTALLATION ONLY -- WET-FORMED PRILL

SOURCES: USGS, 1981; ESE, 1984.

AGRICO CHEMICAL COMPANY



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- 5 STORAGE BUILDING (DOORS)
- 6 TRUCK LOADOUT (BELT TRANSFER, BIN DUMP)
- 7 TRUCK LOADOUT (TO TRUCK)
- △ MAXIMUM CONCENTRATION (1.0 ug/m^3)

N

SCALE
0 0.5 1.0 KILOMETERS

Figure 4-4
COMPOSITE OF MAXIMUM ANNUAL AVERAGE TSP CONCENTRATIONS (ug/m^3) DUE TO PRILLED SULFUR INSTALLATION -- AIR-FORMED PRILL
SOURCES: USGS, 1981; ESE, 1984.

AGRICO CHEMICAL COMPANY

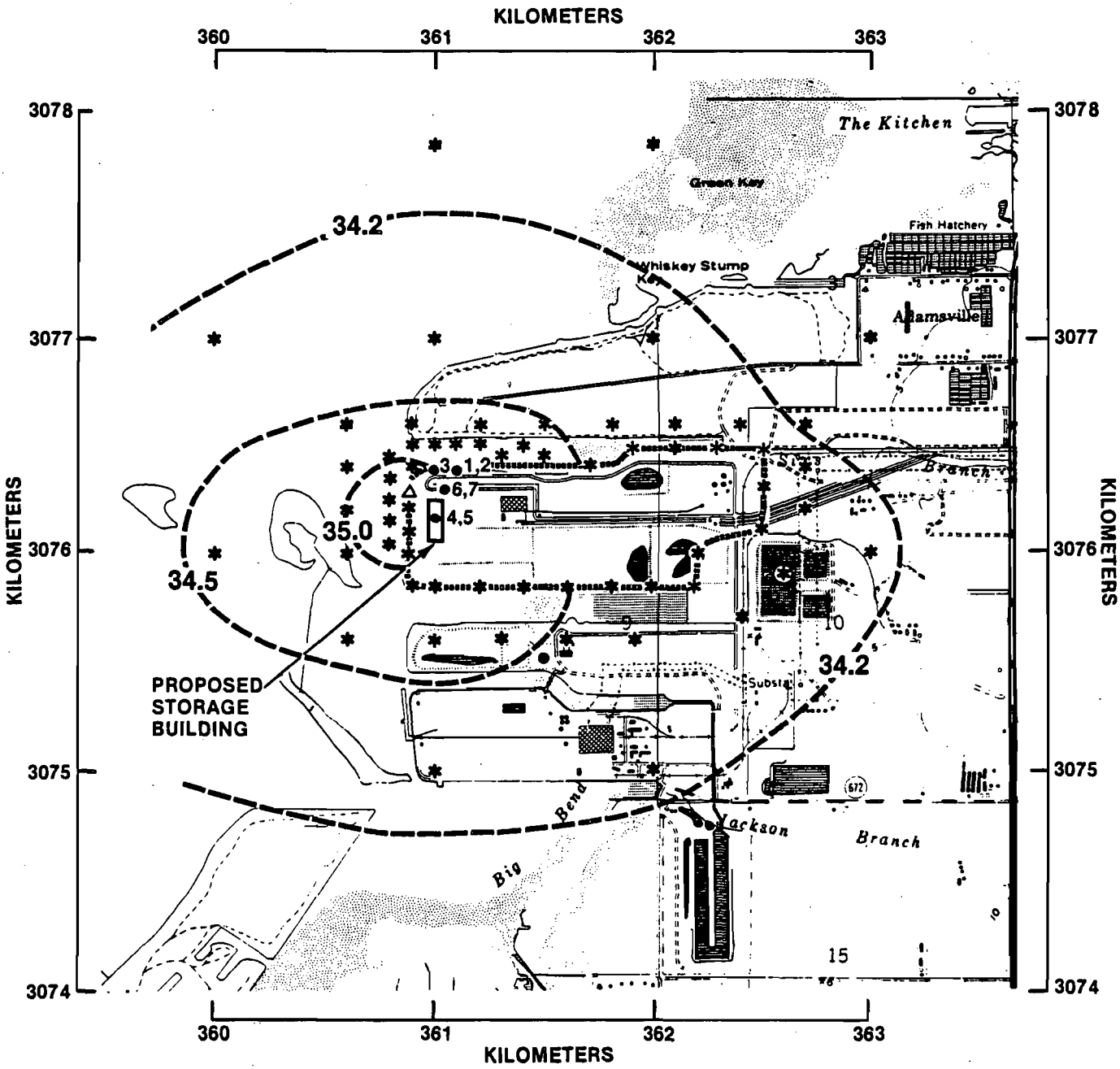

Figure 4-5
COMPOSITE OF MAXIMUM ANNUAL AVERAGE TSP CONCENTRATIONS (ug/m^3) DUE TO ALL SOURCES -- WET-FORMED PRILL

SOURCES: USGS, 1981; ESE, 1984.

AGRICO CHEMICAL COMPANY

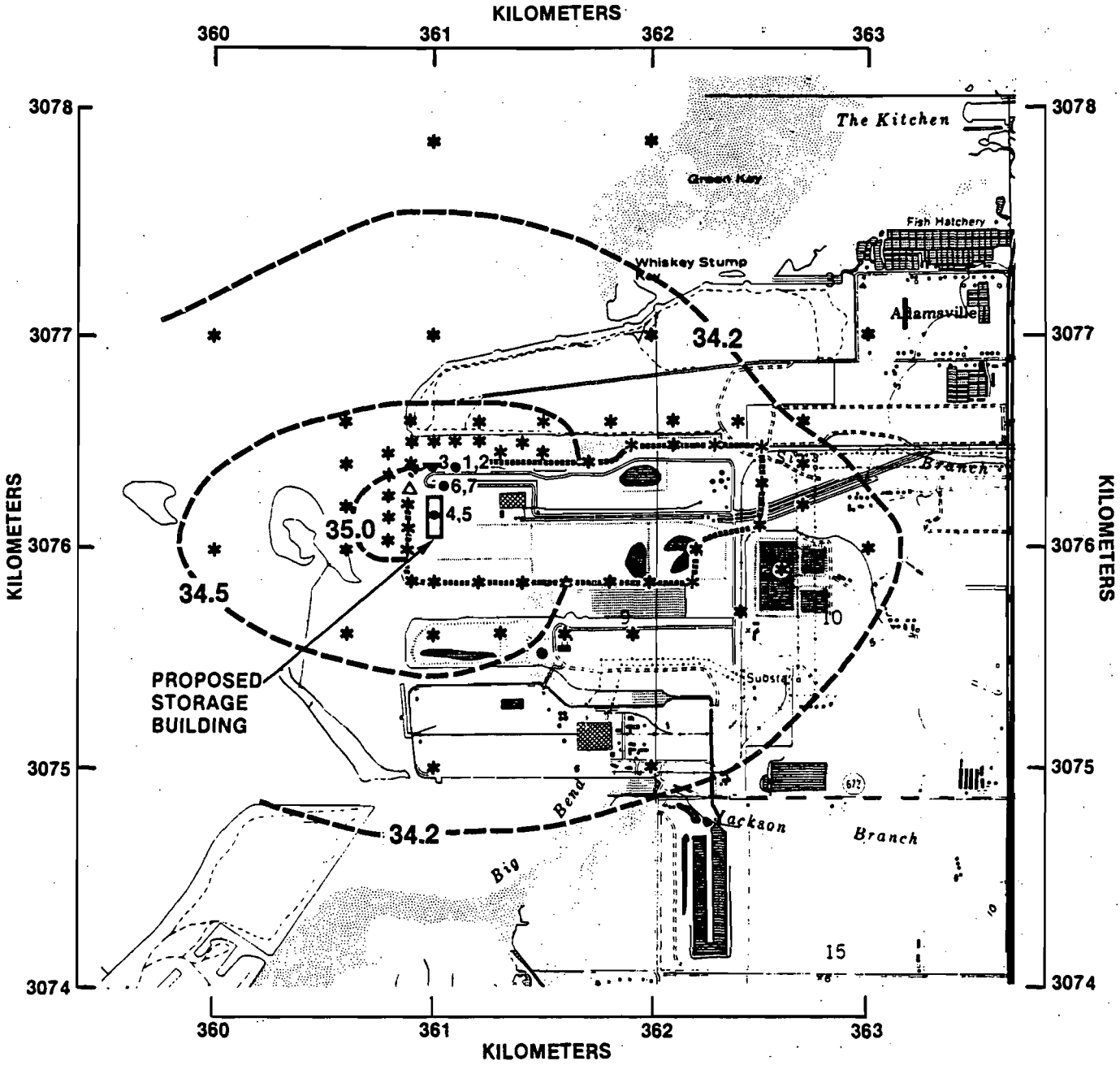

Figure 4-6
COMPOSITE OF MAXIMUM ANNUAL AVERAGE TSP CONCENTRATIONS (ug/m^3) DUE TO ALL SOURCES -- AIR-FORMED PRILL
SOURCES: USGS, 1981; ESE, 1984.

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Table 4-2. Maximum Predicted 24-Hour Average TSP Concentrations Due to Agrico's Interaction with Gardinier and TEC Big Bend Sources

Interaction Source	Year	Concentration ($\mu g/m^3$) Wet-Formed Prill Total	Contribution Due to Modeled Sources*	Background
Gardinier	1974	88.3	24.3	64.0
	1975	90.6	26.6	64.0
	1978	92.1(96.3)†	28.1(32.3)	64.0
	1979	92.9	28.9	64.0
	1981	94.3	30.3	64.0
Big Bend	1974	88.0	24.0	64.0
	1975	87.8	23.8	64.0
	1978	88.7	24.7	64.0
	1979	85.6	21.6	64.0
	1981	84.9	20.9	64.0

*Concentrations from modeled sources due mainly to Agrico sources.
†Results of refined analysis are presented in parentheses. For air-formed prill emissions, the refined modeled sources' contribution of 31.9 $\mu g/m^3$ resulted in a total concentration of 95.9 $\mu g/m^3$.

Source: ESE, 1985.

highest 24-hour concentration for the wet-formed prill emissions. These impacts are all predicted to be well below the 24-hour Florida AAQS. Based on these results, there is minimal interaction of Agrico's emissions with other sources emissions to produce higher concentrations than those from Agrico sources only (see Table 4-1).

The highest, second-highest 24-hour and maximum annual TSP concentration predicted for the nonattainment area for the proposed sulfur installation only is presented in Table 4-3. These results indicate that the maximum concentrations are well below the significance limits. Therefore, the proposed installation will not have a significant impact in the nonattainment area.

4.2 PARTICULATE DEPOSITION RATE ANALYSIS

Results of the sulfur particulate deposition rate analysis for the prilled sulfur installation only are presented in Table 4-4. The results are based upon 1978 meteorological data, which is the year of predicted maximum annual average TSP impacts (see Table 4-1). The maximum annual deposition rate predicted at any receptor was 0.68 grams per square meter (g/m^2) [15.0 pounds per hectare (lb/ha)] for the wet-formed prill and 0.56 g/m^2 (12.2 lb/ha) for the air-formed prill. The maximum monthly deposition rate predicted for any receptor was 0.084 g/m^2 (1.85 lb/ha) for wet-formed prill and 0.069 g/m^2 (1.52 lb/ha) for air-formed prill. The maximum monthly deposition rate was predicted to occur in August for both wet and air-formed prill.

The spatial distribution of annual sulfur particulate deposition rates is portrayed in Figure 4-7 for wet-formed prill and in Figure 4-8 for air-formed prill. Similarly, Figures 4-9 and 4-10 depict the spatial distribution of the composite maximum monthly deposition rates for wet- and air-formed prill, respectively. These figures show that wet-formed prill results in the maximum annual and monthly deposition rates at each receptor.

Table 4-3. Predicted Highest, Second-Highest 24-Hour and Maximum Annual Average TSP Concentrations in the TSP Nonattainment Area Due to the Proposed Prilled Sulfur Installation

Averaging Period	Year	Concentration ($\mu g/m^3$)	
		Wet-Formed Prill	Air-Formed Prill
24-Hour	1974	0.10	*
	1975	0.18	*
	1978	0.24	*
	1979	0.19	*
	1981	0.17	*
Annual	1974	0.012	0.011
	1975	0.006	0.007
	1978	0.008	0.005
	1979	0.005	0.005
	1981	0.005	0.005

*Screening analysis was not performed; concentrations are expected to be less than those for wet-formed prilled sulfur emissions.

Note: Significance Limit: 5 $\mu g/m^3$, 24-hour; 1 $\mu g/m^3$, annual.

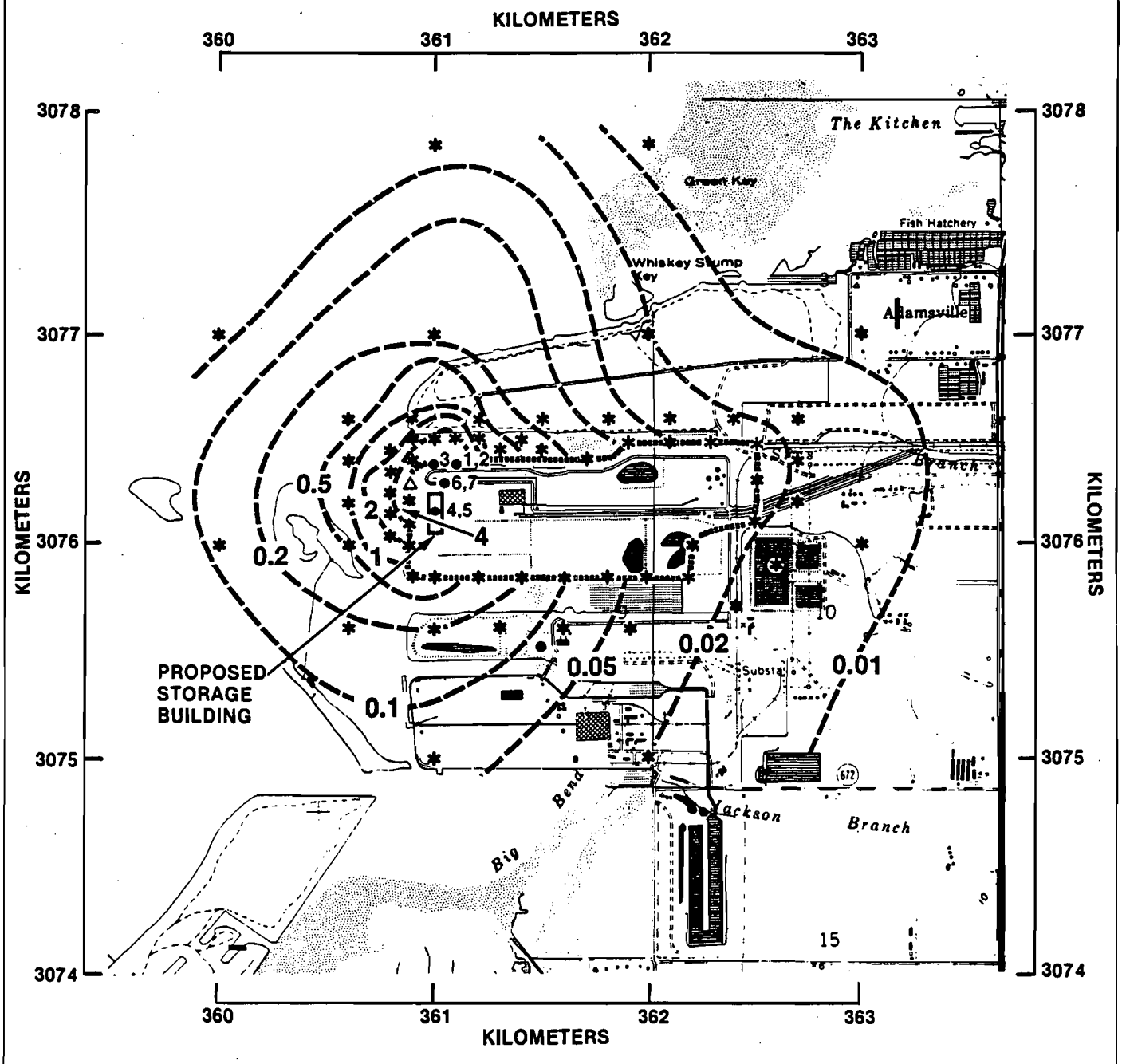
Source: ESE, 1985.

Table 4-4. Estimated Sulfur Particulate Deposition Rates, Prilled Sulfur Installation Only

Period†	Wet-Formed Prill Maximum Deposition Rate*		Air-Formed Prill Maximum Deposition Rate*	
	g/m^2	lb/hectare	g/m^2	lb/hectare
January	0.031	0.68	0.025	0.55
February	0.033	0.73	0.027	0.60
March	0.033	0.73	0.027	0.60
April	0.051	1.12	0.042	0.93
May	0.057	1.26	0.047	1.04
June	0.072	1.59	0.059	1.30
July	0.059	1.30	0.049	1.08
August	0.084	1.85	0.069	1.52
September	0.077	1.70	0.064	1.41
October	0.073	1.61	0.061	1.34
November	0.046	1.01	0.039	0.86
December	0.055	1.21	0.046	1.01
Annual	0.680	15.0	0.555	12.23

*All maximum deposition rates were predicted to occur at UTM location 360.9, 3,076.3.
†Based on 1978 meteorological data.

Note: g/m^2 x 22.03 = lb/hectare.



KEY
- ---- PLANT SITE BOUNDARY
- * RECEPTOR
- 1 CLAMSHELL-HOPPER
- 2 HOPPER-BELT
- 3 BELT-BELT TRANSFER
- 4 STORAGE BUILDING (VENT)
- 5 STORAGE BUILDING (DOORS)
- 6 TRUCK LOADOUT (BELT TRANSFER, BIN DUMP)
- 7 TRUCK LOADOUT (TO TRUCK)
- △ MAXIMUM DEPOSITION (15.0 lb/hectare)

N

SCALE
0 0.5 1.0 KILOMETERS

Figure 4-7
ANNUAL SULFUR PARTICULATE DEPOSITION RATES (lb/hectare) -- WET-FORMED PRILL

SOURCES: USGS, 1981; ESE, 1984.

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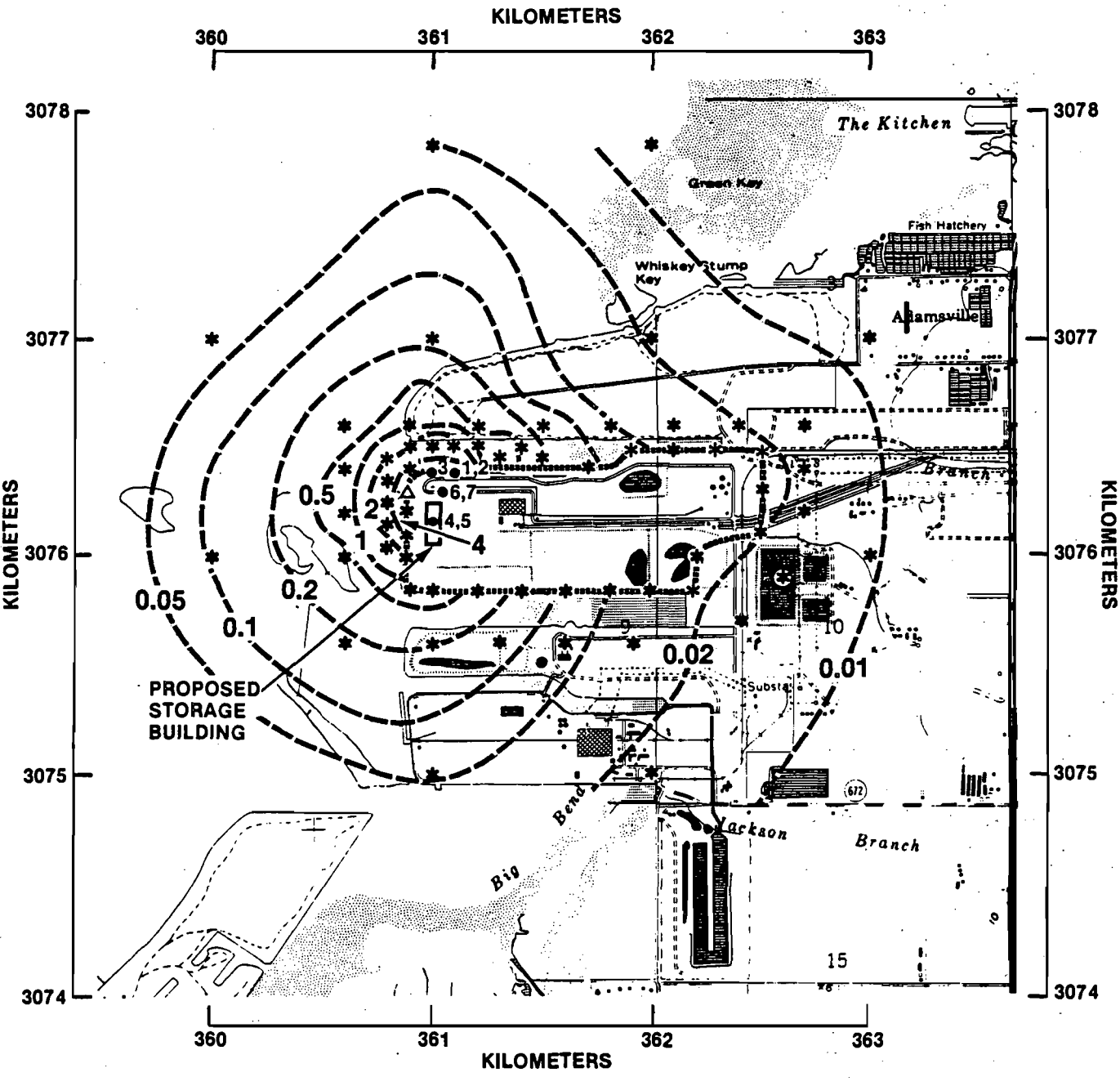

Figure 4-8
ANNUAL SULFUR PARTICULATE DEPOSITION RATES (lb/hectare) -- AIR-FORMED PRILL

SOURCES: USGS, 1981; ESE, 1984.

AGRICO CHEMICAL COMPANY

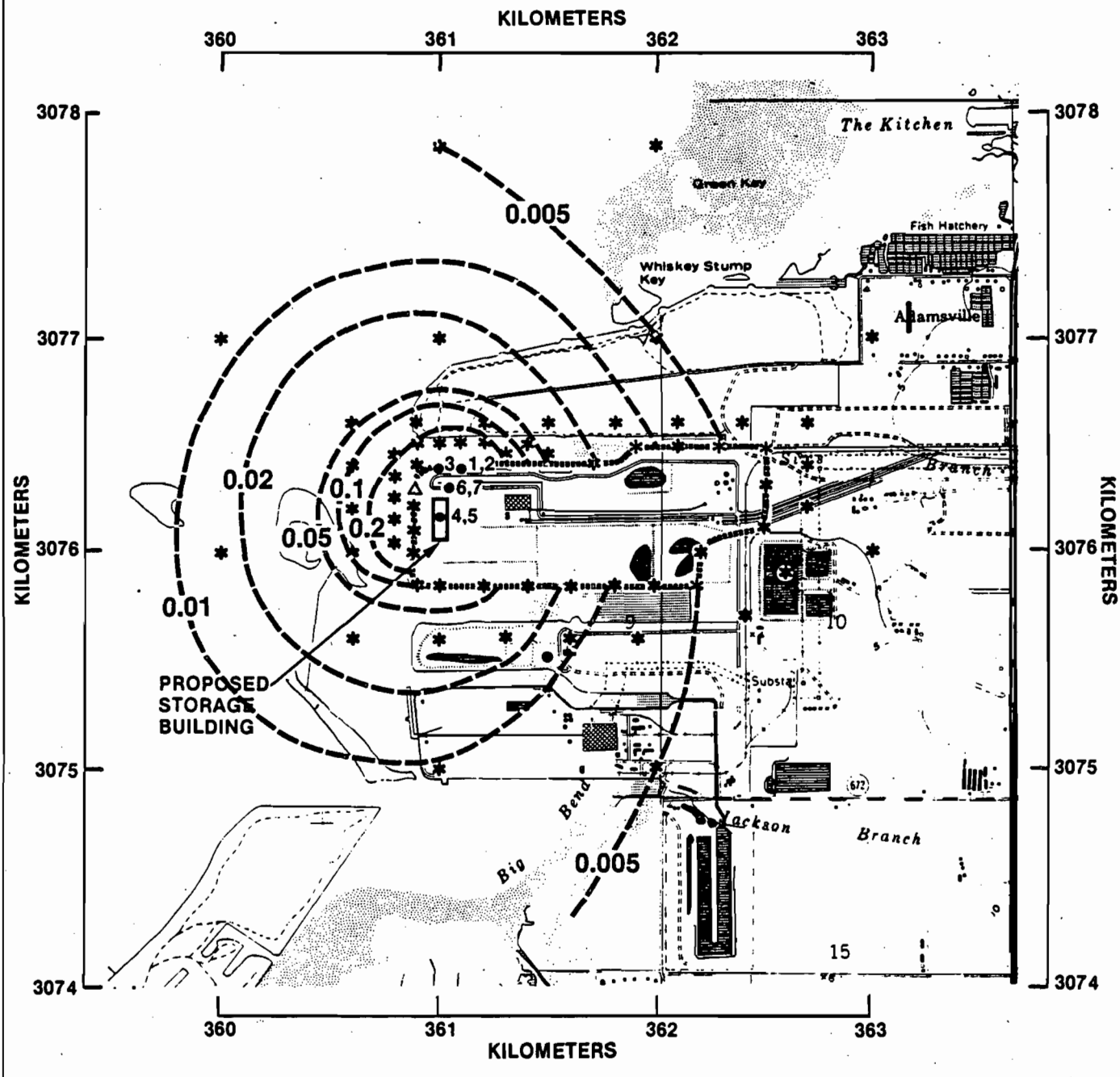

Figure 4-9
MONTHLY SULFUR PARTICULATE DEPOSITION RATE (lb/hectare) -- WET FORMED PRILL

SOURCES: USGS, 1981; ESE, 1984.

AGRICO CHEMICAL COMPANY

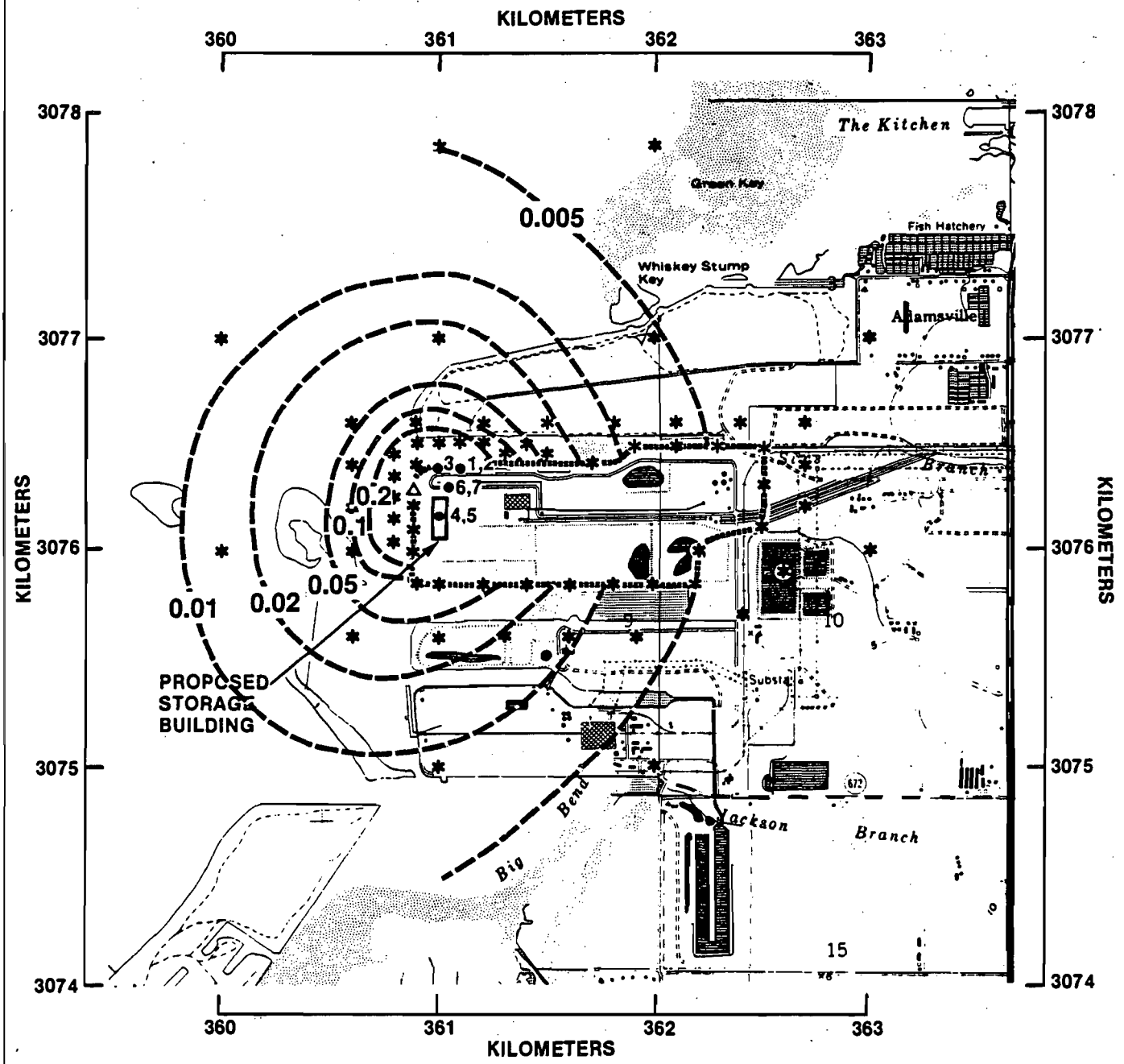

Figure 4-10
MONTHLY SULFUR PARTICULATE DEPOSITION RATE (lb/hectare) -- AIR FORMED PRILL

SOURCES: USGS, 1981; ESE, 1984.

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APPENDIX A

ESTIMATION OF SULFUR PARTICULATE EMISSIONS FROM AGRICO'S BIG BEND PRILLED SULFUR TERMINAL

A.1 SUSPENDED SULFUR PARTICULATE ESTIMATES

Agrico's proposed Big Bend prilled sulfur terminal has been designed with the latest engineering concepts and in conformance with the recently adopted Florida Administrative Code, Chapter 17-2 rules related to solid sulfur handling in Florida. The following discussion pertains to the recent adoptions and the estimation of sulfur particulate emissions for the Big Bend terminal.

Rule 17-2.215 sets forth requirements for emissions estimates. Rule 17-2.215(4) requires that EPA "Compilation of Air Pollutant Emission Factors, Supplement No. 14," commonly known as AP-42, be used to estimate sulfur particulate emissions. After thorough review of AP-42, Agrico has selected three equations from AP-42 which apply to the prilled sulfur operations at Big Bend:

1. Equation (1) of Section 11.2.3, Aggregate Handling and Storage Piles, commonly referred to as the batch drop operation emission factor equation;
2. Equation (2) of Section 11.2.3, Aggregate Handling and Storage Piles, commonly referred to as the continuous drop operation emission factor equation; and
3. Equation (1) of Section 11.2.6, Industrial Paved Roads, commonly referred to as the industrial paved roads emission factor equation.

The industrial paved roads equation was selected over the unpaved roads emission factor equation [AP-42, Section 11.2.1, Equation (1)] for two reasons. First, the payloader traffic will be totally enclosed inside the storage building; therefore, correction factors for rainfall and atmospheric wind speed are not appropriate. Secondly, the payloader will travel on a paved surface; thus, the paved roads emission factor is most appropriate.

Table A-1 defines the equations and parameters used in developing the suspended sulfur particulate emission factors for Big Bend Terminals. The resulting emission factors for suspended sulfur particulate are presented in Table A-2. Both wet-formed prill and air-formed prill may be handled at Big Bend; therefore, emission estimates are provided for both types of prill.

The batch drop equation applies to two operations: (1) the clamshell bucket drop to the dockside receiving hopper, and (2) the payloader drop to the conveyor belt inside the storage building. A tight-lipped clamshell bucket will be used to off-load prilled sulfur from the marine vessel to the dockside receiving hopper. No particulate emissions will result from use of the tight-lipped clamshell for transfer of the material.

The continuous drop equation applies to all other sulfur operations at Big Bend, except for the payloader travel between the storage pile and receiving hopper. The industrial paved roads equation applies to the vehicle traffic of the payloader.

Rule 17-2.215(4)(a) requires that emission estimates reflect particulate matter (PM) that would be measured by a high-volume air sampler as specified in the reference sampling method for total suspended particulates (TSP). As a result, no particle size correction factors were applied (i.e., k = 1.0).

The values for silt content for wet- and air-formed prills were obtained from Dr. Dale Lundgren, Professor of Environmental Engineering, University of Florida and Mr. Harold Long, Agrico Chemical Company. Dr. Lundgren has performed testing of wet-formed prilled sulfur for moisture and silt contents. The results of the testing were reported in "Summary Report on the Dust Emission Factor for Wet-Prilled Sulfur," 1984. Wet-formed prilled sulfur loaded onto a ship in Vancouver, British

Columbia, were found to contain 2.0 percent silt on the average, while moisture content was 2.55 percent on the average. Wet-formed prill off-loaded from a ship at Norfolk, Virginia, was found to average 2.2 percent silt and 2.4 percent moisture. Values of 5 percent silt and 2 percent moisture were chosen for the Agrico Big Bend Terminal emission estimates to represent conservative, worst-case conditions.

Air-formed prilled sulfur is expected to average less than 1 percent silt at 1 percent moisture. A maximum upper limit of silt in the air-formed prill is expected to be 4 percent, with an associated moisture content of 2 percent. These values are based upon testing on air-formed polish prill by Orlando Laboratories ("Discussion of Tests Performed of Prilled Sulfur for Agrico Chemical Company," April 22, 1983). Both of these conditions were considered in developing the emission estimates for the Agrico Big Bend Terminal (see Table A-1).

The recently adopted rules require enclosure of all sulfur transfer and storage operations at Big Bend. Big Bend is located within 5 km of the Hillsborough County particulate nonattainment area. Rule 17-2.600(11)(b), Solid Sulfur Handling Facilities, has the following provisions:

1. Marine Vessel Unloading
   e. The hopper receiving solid sulfur unloaded from marine vessels shall be constructed with wind walls and a top with slots provided to enable entry and exiting of a clamshell bucket.
   f. The clamshell bucket shall be positioned within the wind walls prior to discharging sulfur into the receiving hopper.
   g. The clamshell bucket shall be closed completely before being withdrawn from the receiving hopper and returned to the marine vessel.

Table A-1. Suspended Sulfur Particulate Emissions Factors, Equations, and Parameters for Agrico's Big Bend Terminal

Basic Emission Factor Equations from AP-42, Supplement 14, May 1983:

(1) Batch Drop Operation (AP-42 Section 11.2.3, Aggregate Handling and Storage Piles)

$$E = k(0.0018) \frac{\left(\frac{s}{5}\right)^{2} \left(\frac{U}{5}\right)^{2} \left(\frac{H}{5}\right)^{(0.33)}}{\left(\frac{M}{2}\right)^{2} \left(\frac{Y}{6}\right)^{(0.33)}} \text{ lb/ton}$$

(2) Continuous Drop Operation (AP-42 Section 11.2.3)

$$E = k(0.0018) \frac{\left(\frac{s}{5}\right)^{2} \left(\frac{U}{5}\right)^{2} \left(\frac{H}{10}\right)^{2}}{\left(\frac{M}{2}\right)^{2}} \text{ lb/ton}$$

(3) Vehicle Traffic (AP-42 Section 11.2.6, Industrial Paved Roads)

$$E = k(0.090)\, I \left(\frac{4}{n}\right) \left(\frac{S}{10}\right) \left(\frac{L}{1{,}000}\right) \left(\frac{W}{3}\right)^{0.7} \text{ lb/VMT}$$

Referred sections of AP-42 are attached in Appendix B.

Batch drop and continuous drop parameters are defined as follows:

k = 1.0 (no particle size correction);
s = 5% for wet-formed prill at 2% moisture,
  = 1% for air-formed prill at 1% moisture,
  = 4% for air-formed prill at 2% moisture;
M = moisture contents as specified above;
U = 1 or 2 mph (see text for details);
H = drop height is variable (see Table A.2); and
Y = 13 yd^3 for clamshell, 14 yd^3 for payloader.

Vehicle traffic parameters are defined as follows:

k = 1.0 (no particle size correction);
I = 1.0 (traffic does not travel unpaved areas);
n = 2 (2 traffic lanes assumed);
s = 8% silt*;
L = 2,000 lb/mile*; and
W = 42 tons, payloader weight.

*Typical values from Table 3-8 of "Measurement of Fugitive Dust Emissions from Prilled Sulfur Handling," Final Report, Midwest Research Institute, June 1984.

Sources: ESE, 1985.
Agrico Chemical Company, 1985.

Table A-2. Suspended Sulfur Particulate Emissions Factors for Agrico's Big Bend Terminal

Operation	Equation	k	s (%)	U (mph)	H (ft)	M (%)	Y (yd^3)	E (lb/ton)
			Wet-Formed Prill					
Clamshell to hopper	1	1.0	5	2	5	2	13	0.000558
Hopper to belt	2	1.0	5	2	5	2	--	0.00036
Belt to belt	2	1.0	5	2	5	2	--	0.00036
Belt to storage pile	2	1.0	5	1	25	2	--	0.00090
Payloader to belt	1	1.0	5	2	5	2	14	0.000544
Belt to bin	2	1.0	5	2	5	2	--	0.00036
Bin dump	2	1.0	5	2	5	2	--	0.00036
Bin to truck	2	1.0	5	2	5	2	--	0.00036
			Air-Formed Prill					
Clamshell to hopper	1	1.0	1(4)*	2	5	1(2)*	13	0.000446
Hopper to belt	2	1.0	1(4)*	2	5	1(2)*	--	0.000288
Belt to belt	2	1.0	1(4)*	2	5	1(2)*	--	0.000288
Belt to storage pile	2	1.0	1(4)*	1	25	1(2)*	--	0.000720
Payloader to belt	1	1.0	1(4)*	2	5	1(2)*	14	0.000436
Belt to bin	2	1.0	1(4)*	2	5	1(2)*	--	0.000288
Bin dump	2	1.0	1(4)*	2	5	1(2)*	--	0.000288
Bin to truck	2	1.0	1(4)*	2	5	1(2)*	--	0.000288

Operation	k	I	n	S (%)	L (lb/mile)	W (tons)	E (lb/VMT)
				Wet-Formed and Air-Formed Prill			
Vehicle traffic	1.0	1.0	2	8	2,000	42	1.827

*Two sets of silt and moisture contents were evaluated. The value of silt in parentheses corresponds to the value of moisture in parentheses.

Sources: ESE, 1985.
Agrico Chemical Company, 1985.

2. Solid Sulfur Transfer
   a. Sulfur Transferred by Conveyor Belt Systems
      iii. All conveyor-to-conveyor and all hopper-to-conveyor transfer points shall be enclosed.
      v. Hoppers receiving solid sulfur transferred by conveyor belt systems shall be constructed with wind walls enclosing the top and a minimum of three sides of the receiving hopper.
3. Solid Sulfur Storage
   a. Areas used for the storage of solid sulfur in a PM nonattainment area, PSD Class I area, or within 5 km of such area shall be entirely housed in a vented structure completely enclosed by roof and walls, and shall be paved with an asphaltic material or Department-approved equivalent.

As a result, all prilled sulfur transfer and storage operations at Big Bend will be enclosed. The batch drop and continuous drop emission factor equations of AP-42 include a wind speed term. Since the enclosures reduce the wind speed to which the prilled sulfur is exposed, the most appropriate method of accounting for reductions in emissions due to the enclosures is in the wind speed term. Enclosure is considered to reduce emissions by 75 percent. The annual average wind speed in Tampa is 8 mph; therefore, a wind speed of 2 mph was used in the equations, where applicable, to result in the 75-percent reduction in emissions. This methodology is applicable to all operations with enclosures, except for the storage building.

The storage building will be completely sealed except for the roof vent at the top of the building (i.e., all doors will be kept closed except for momentary periods when equipment must be moved in or out of the building). Therefore, the wind speed within the building will be near zero. For the conveyor belt-to-storage pile operation, a wind speed of

1 mph was selected for use in the continuous drop equation. This wind speed is considered to be a lower limit for use in the AP-42 equation. For the payloader-to-belt operation, a wind speed of 2 mph was selected, since the payloader is considered to create some air disturbance as it travels from the storage pile to the receiving hopper.

Rule 17-2.600(11)(b)2.a.vi requires that no vertical drop at any conveyor transfer point exceed 5 ft. Rule 17-2.600(11)(b)2.b.iii states that the maximum drop height when transferring solid sulfur by payloader or mechanical equipment shall not exceed 5 ft. In response to these requirements, all drop heights at Big Bend's sulfur handling operations will not exceed 5 ft, except for the loading onto the sulfur storage pile, of which drop height is estimated to average 25 ft.

The clamshell bucket and payloader capacities shown in Tables A-1 and A-2 are based upon actual equipment design.

In developing the parameter values for the industrial paved road emission factor equation, a recent study conducted by Midwest Research Institute entitled "Measurement of Fugitive Dust Emission from Prilled Sulfur Handling" (1984) was reviewed. MRI's results compared very well with the industrial paved road equation. The only assumption made in MRI's study was that the number of traffic lanes (n) was set equal to 2. Therefore, this assumption was also adopted for Big Bend. The industrial augmentation factor (I) is equal to 1.0 since the payloader does not travel on any unpaved surfaces. As discussed previously, Rule 17-2.600(11)(b)3 requires the entire sulfur storage area to be paved. In addition, Rule 17-2.600(11)(b)3.d and 3.e require that the surfaces within the sulfur storage area traveled by payloaders used to transfer solid sulfur be cleaned at least daily by spraying with water to prevent excess accumulation of sulfur particulates. MRI's study conditions consisted of either no cleaning or cleaning just prior to payloader operation. Agrico believes values for s and L lying between the values

measured by MRI are appropriate for typical operation. Therefore, the values for s and L shown in Tables A-1 and A-2 were selected for use in the industrial paved road equation.

Wetting with a chemical wetting agent or with water will be performed on the sulfur handling operations at Big Bend to afford a greater degree of control. Rule 17-2.600(11)(b)1.h requires that the hopper receiving solid sulfur unloaded from marine vessels shall be equipped with a water spray system located around the periphery of the receiving hopper. The water spray system shall contain an effective wetting agent and shall be operated continuously during all unloading or transfer operations. Rule 17-2.600(11)(b)2.a.iv requires that conveyor transfer systems shall include water spray systems at all transfer points. The system shall spray water containing an effective wetting agent and shall be operated continuously at all times when transfer is occurring. Rule 17-2.600(11)(b)3.d requires that surfaces within the sulfur storage area traveled by payloaders or mechanical equipment used to transfer solid sulfur shall be periodically wetted with an effective wetting agent to minimize unconfined particulate emissions. The control efficiencies estimated for these additional controls to be implemented at Big Bend are shown in Table A-3.

The resulting sulfur particulate emission estimates for Big Bend are shown in Table A-3. Throughput rates are based upon the maximum operating capacity of the equipment. Truck loadout of sulfur is limited by the trucks to 84 short TPH. In addition, Rule 17-2.600(11)(b)2.b.i requires that payloaders used to transfer solid sulfur shall not exceed 75 percent bucket capacity. Vehicle miles traveled per hour (VMT/hr) for the payloader were estimated as follows:

Capacity of payloader = 14 yd^3

Density of sulfur = 70 lb/ft^3

Table A-3. Suspended Sulfur Particulate Emission Estimates, Agrico's Big Bend Terminal

Operation	Emission Factor (lb/ton)	Rate (short TPH)	Control	Eff. (%)	Operation (hr/yr)	Suspended Particulate Emission Rate (lb/yr)	(short TPY)
			Wet-Formed Prill				
Clamshell to hopper	0.000558	672	Wetting agent	85	1,000	0.056	0.028
Hopper to belt	0.00036	672	Wetting agent	85	1,000	0.036	0.018
Belt to belt	0.00036	672	Wetting agent	85	1,000	0.036	0.018
Belt to storage pile	0.00090	672	—	—	1,000	0.605	0.302
Vehicle traffic	1.827*	0.41†	Wetting agent	50	8,000	0.375	1.50
Payloader to belt	0.000544	84	Wetting agent	85	8,000	0.0069	0.027
Belt to bin	0.00036	84	Wetting agent	85	8,000	0.0045	0.018
Bin dump	0.00036	84	—	—	8,000	0.030	0.121
Bin to truck	0.00036	84	—	—	8,000	0.030	0.121
TOTAL						1.179	2.153
			Air-Formed Prill				
Clamshell to hopper	0.000446	672	Wetting agent	85	1,000	0.045	0.022
Hopper to belt	0.000288	672	Wetting agent	85	1,000	0.029	0.015
Belt to belt	0.000288	672	Wetting agent	85	1,000	0.029	0.015
Belt to storage pile	0.000720	672	—	—	1,000	0.484	0.242
Vehicle traffic	1.827*	0.41†	Wetting agent	50	8,000	0.375	1.50
Payloader to belt	0.000436	84	Wetting agent	85	8,000	0.0055	0.022
Belt to bin	0.000288	84	Wetting agent	85	8,000	0.0036	0.015
Bin dump	0.000288	84	—	—	8,000	0.024	0.097
Bin to truck	0.000288	84	—	—	8,000	0.024	0.097
TOTAL						1.019	2.025

*lb/VMT.
†VMT/hr.

Sources: ESE, 1985.
Agrico Chemical Company, 1985.

Actual payloader capacity = 14 yd^3 x 0.75 x 27 ft^3/yd^3
x 70 lb/ft^3 ÷ 2,000 lb/ton
= 9.92 tons

Payloader trips = 84 TPH ÷ 9.92 tons/trip
= 8.5 trips/hr

Round off to 9 trips/hr @ 240 ft/round trip
9 x 240 ft ÷ 5,280 = 0.41 VMT/hr

Rule 17-2.600(11)(b)3.a further requires that the vented emissions from a solid sulfur storage building located within 5 km of a particulate nonattainment area not exceed 0.03 pounds per hour per thousand ton storage capacity (lb/hr/1,000 ton storage capacity). From Table A-3, the maximum vented emissions from the building (belt-to-storage pile, vehicle traffic, and payloader to belt) are from wet-formed prill and total 0.9869 lb/hr. The storage capacity of the building will be 50,000 long tons (56,000 short tons). This equates to 0.018 lb/hr/1,000 ton storage capacity, well below the emission limit.

A.2 SULFUR DEPOSITION RATE EMISSION ESTIMATES

Rule 17-2.515(4)(c) sets forth the requirements to determine sulfur deposition rate emission factors. These factors are to be used to estimate sulfur deposition rates due to emissions from a sulfur handling facility. The rule requires that a particle-size distribution curve (aerodynamic particle diameter size) be calculated based upon tests, published data, or prior test results. Particles from 0 to 300 micrometers (μm) in diameter are to be considered. The emission estimates developed according to Rule 17-2.215(4)(a) (i.e., Table A-3 as applied to Big Bend) must be assumed to represent the 0- to 30-μm size particles. Using these emission estimates and the calculated particle-size distribution, the weight of particles in the 30- to 300-μm size range is to be estimated. For deposition calculations, the distribution is to be broken into a number of particle-size ranges, with the mass median diameter used to represent each particle-size category. Control efficiencies are to be developed and applied to each particle-size range. Agrico has developed sulfur deposition emission estimates according to the applicable rules, as described below.

A particle-size distribution curve for particulate emissions from prilled sulfur was prepared by Dr. Chatten Cowherd of Midwest Research Institute (MRI). This distribution is based on particle-size data given in AP-42 and MRI prilled sulfur emissions measurements reported in "Measurement of Fugitive Dust Emissions from Prilled Sulfur Handling" (June 1984). The MRI data, obtained for wet-formed prilled sulfur, are in general agreement and support the AP-42 data.

The procedure for developing the particle-size distribution is based on the particle size data given in AP-42 (batch drop equation) together with the MRI emissions data collected during the June (1984) field tests. The size distribution of the <50 μm Aerodynamic (μmA) particulate emissions measured during the first nine handlings of the sulfur prill in California was found to agree very closely with AP-42. A spline-fit of

the sulfur particle-size data, following the procedure described in "A Computer-Based Cascade Impactor Data Reduction System" (EPA-600/7-78-042), was used to obtain an estimate of the mass fraction of total particulate emissions in the <50 μmA particle-size range, for which the AP-42 equations were originally developed. A second spline-fit for particles of all sizes was then obtained using the estimated <50 μmA fraction, the size fractions given in AP-42, and an estimated largest particle diameter of 300 μmA. The resulting particle size distribution is shown in Figure A-1 and represents uncontrolled total sulfur particle emissions. Since the California testing represents the only particle size data for sulfur particulate emissions, Figure A-1 was assumed applicable to both wet- and air-formed prilled sulfur particulate emissions.

In performing the deposition calculation, the mass distribution curve must be divided into a number of particle-size intervals. This number should normally be 10, or at most 20. The distribution should be divided into equal weight fractions. If 10 intervals are chosen, each interval should represent 10 percent of the total aerosol mass. Each interval should be modeled using the interval mass median particle size to represent that interval. For example, the cumulative mass distribution curve (see Figure A-1) would be divided into 10 equal mass fractions (0 to 10 percent, 10 to 20 percent, 20 to 30 percent, etc.). The mass median diameter of the 0- to 10-percent fraction is the 5-percent particle size. The mass median diameter of the 10- to 20-percent fraction is the 15-percent particle size, etc.

These 10 median diameters (5-percent size, 15-percent size, 25-percent size, 35-percent size, etc.) are then used to make the deposition calculations using the gravitational settling velocity for particles of these sizes. Ten percent of the total aerosol mass is attributed to each interval and the results of the ten calculations summed to obtain the total deposition.

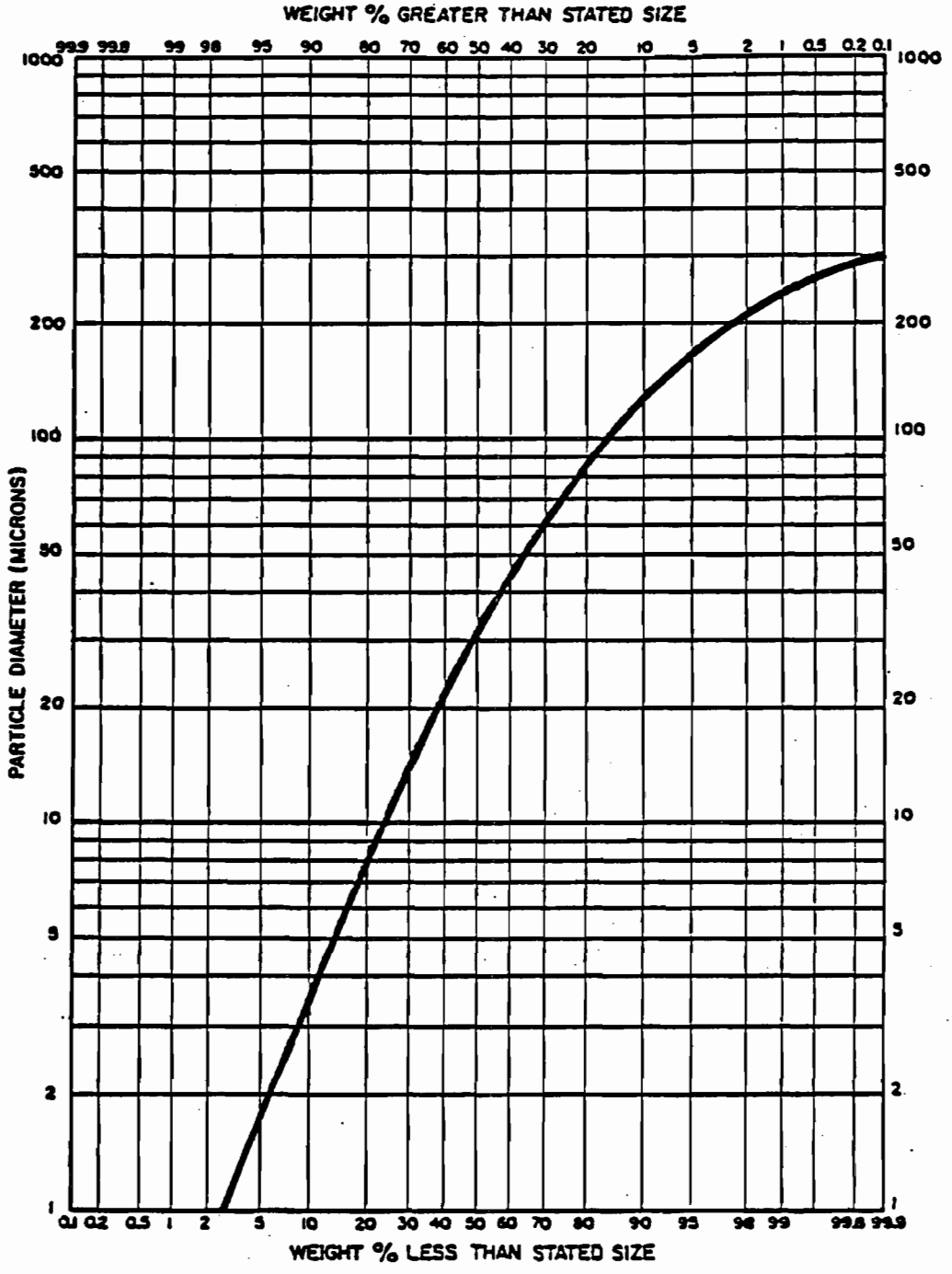

Figure A-1
PARTICLE SIZE DISTRIBUTION FOR FUGITIVE EMISSIONS FROM PRILLED SULFUR

SOURCE: MRI, 1985.

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If the most accurate calculation is desired, then 20 intervals, each representing 5 percent of the total aerosol mass, would be used. Inherent model limitations and inaccuracy limit the maximum useful interval number to 20. Ten intervals would normally produce similar accuracy. Ten intervals were therefore used for the Big Bend analysis.

For the distribution shown, the ten diameters used in the deposition calculations are as follows:

D-5% = 2 μm, Settling Velocity = 0.013 cm/sec
D-15% = 6 μm, Settling Velocity = 0.11 cm/sec
D-25% = 11 μm, Settling Velocity = 0.37 cm/sec
D-35% = 18 μm, Settling Velocity = 0.98 cm/sec
D-45% = 26 μm, Settling Velocity = 2.04 cm/sec
D-55% = 37 μm, Settling Velocity = 4.14 cm/sec
D-65% = 52 μm, Settling Velocity = 8.14 cm/sec
D-75% = 64 μm, Settling Velocity = 11.7 cm/sec
D-85% = 110 μm, Settling Velocity = 29.0 cm/sec
D-95% = 160 μm, Settling Velocity = 52.0 cm/sec

Total aerosol mass used in the deposition calculations is determined by multiplying the AP-42 calculated emissions by 2.1. The 2.1 factor was derived from Figure A-1 by assuming that the AP-42 estimates represent the total aerosol mass in the 0- to 30-μm size range (i.e., 48 percent by weight). The resulting emissions represent total aerosol mass in the 0- to 300-μm size range. Ten percent of this total mass is apportioned to each of the ten particle sizes listed above to represent the ten distribution weight fractions modeled.

The control measures to be applied to the prilled sulfur installation operations were discussed previously and were summarized in Table A-3. Sufficient data are not available to estimate control efficiency versus particle-size category for these control measures for 0- to 300-μm particles. Therefore, the control efficiencies shown in Table A-3 were

assumed to apply equally to all particle-size categories. The suspended particulate emissions after control, shown in Table A-3, can then be multiplied by the previously derived factor of 2.1 to obtain total particulate emissions (0 to 300 μm) after control. The storage building will provide an additional control on total particulate emissions by preventing some of the larger particle sizes from escaping from the building. The building is estimated to achieve a 67 percent reduction in total particulate emissions. Estimated total particulate emissions for the Big Bend sulfur installation are shown in Table A-4. The derivation of the 67 percent control efficiency and a modified particle-size distribution for the building are described below.

Removal of particulate matter in the storage building will result because of gravitational settling. An estimate of this removal is possible by using one or more models and making certain assumptions. Two extreme models will be used for this purpose and an average of the two used to represent a most probable or best estimate of the expected removal.

A very simple model can be set up by balancing the average upward air velocity (assumed to be 2 ft/min, based upon good industrial ventilation practice) against the particle settling velocity. In this simple analysis, all particles having a gravitational settling velocity greater than 2 ft/min will settle out, while all particles having a lower settling velocity will be carried out the building top by the upward moving air stream. This model is called the laminar flow model and the removal efficiency called the laminar flow efficiency (η). The model predicts that all particles less than 18-μm diameter will be emitted and that all particles greater than 18-μm will be removed or will settle out. Particles of 18-μm size settle at a velocity of 2 ft/min.

As a second extreme, the air turbulence within the building can be assumed to be so great as to cause particles of all sizes to be uniformly mixed throughout the entire building volume. To set up such a model, it

Table A-4. Total Sulfur Particulate Emission Estimates, Agrico's Big Bend Terminal

Operation	Suspended Particulate Emission Rate* (lb/hr)	Suspended Particulate Emission Rate* (short TPY)	Aerosol Mass Multiplier†	Control	Control Efficiency (%)	Operation (hr/yr)	Total Particulate Emission Rate (lb/hr)	Total Particulate Emission Rate (short TPY)	Particle-Size Distribution
WET-FORMED PRILL									
Clamshell to hopper	0.056	0.028	2.1	—	—	1,000	0.118	0.059	Fig. A-3
Hopper to belt	0.036	0.018	2.1	—	—	1,000	0.076	0.038	Fig. A-3
Belt to belt	0.036	0.018	2.1	—	—	1,000	0.076	0.038	Fig. A-3
Belt to storage pile	0.605	0.302	2.1	Building	67	1,000	0.419	0.209	Fig. A-4
Vehicle traffic	0.375	1.50	2.1	Building	67	8,000	0.260	1.040	Fig. A-4
Payloader to belt	0.0069	0.027	2.1	Building	67	8,000	0.0048	0.019	Fig. A-4
Belt to bin	0.0045	0.018	2.1	—	—	8,000	0.0095	0.038	Fig. A-3
Bin dump	0.030	0.121	2.1	—	—	8,000	0.063	0.254	Fig. A-3
Bin to truck	0.030	0.121	2.1	—	—	8,000	0.063	0.254	Fig. A-3
TOTAL	1.179	2.153					1.0893	1.949	
AIR-FORMED PRILL									
Clamshell to hopper	0.045	0.022	2.1	—	—	1,000	0.095	0.046	Fig. A-3
Hopper to belt	0.029	0.015	2.1	—	—	1,000	0.061	0.032	Fig. A-3
Belt to belt	0.029	0.015	2.1	—	—	1,000	0.061	0.032	Fig. A-3
Belt to storage pile	0.484	0.242	2.1	Building	67	1,000	0.335	0.168	Fig. A-4
Vehicle traffic	0.375	1.50	2.1	Building	67	8,000	0.260	1.040	Fig. A-4
Payloader to belt	0.0055	0.022	2.1	Building	67	8,000	0.0038	0.015	Fig. A-4
Belt to bin	0.0036	0.015	2.1	—	—	8,000	0.0076	0.032	Fig. A-3
Bin dump	0.024	0.097	2.1	—	—	8,000	0.050	0.204	Fig. A-3
Bin to truck	0.024	0.097	2.1	—	—	8,000	0.050	0.204	Fig. A-3
TOTAL	1.019	2.025					0.9234	1.773	

*From Table A-3 (after control emissions).
†To convert from suspended particulate (0-30 μm) to total particulate (0-300 μm).

Sources: ESE, 1985.
Agrico Chemical Company, 1985.

is necessary to assume a rectangular building of base (B), width (W), and height (H) with an average upward air velocity (V). Residence time (t) of a gas parcel in the building is, on the average, equal to building height (H) divided by upward air velocity (V).

If the change in building particle concentration (dC) is expressed as a function of the time interval (dt), building concentration (C), particle settling velocity (V_s), and building height (H), the following equation is arrived at:

$$dC = -C \frac{V_s \, dt}{H}$$

After integration, the particle size removal efficiency (η_i), as a function of the particle settling velocity (V_i), is:

$$\eta_i = 1 - e^x$$

$$\text{where:} \quad x = \frac{-V_i \, t}{H}$$

Average upward air velocity (V) is the distance (H) divided by time (t). Therefore, the equation can also be expressed as:

$$\eta_i = 1 - e^y$$

$$\text{where:} \quad y = \frac{-V_i}{V} \, .$$

This represents a back mixing model or turbulent flow model and is a worst-case model. This will be referred to as the turbelent flow model, and the resulting particle removal efficiency will be referred to as the turbulent flow efficiency (η_t).

A value of 2 ft/min upward air velocity is a recommended value for ventilating a storage building. A storage building of 200-ft base (B) and 600-ft width (W) would require a ventilation rate of 240,000 cubic feet per minute (cfm) for an upward velocity of 2 ft/min. If the maximum storage capacity of the building is assumed, the average vertical distance between the building roof and the pile top is about 20 ft. This then predicts an average air residence time (t) of 10 minutes (H = 20 ft divided by V = 2 ft/min). This is equivalent to a free air space ventilation rate of 1 in 10 minutes or 6 air changes per hour. It would represent fewer air changes for an empty building.

The laminar flow model predicts 65 percent aerosol removal (on a mass basis) or 35 percent remaining. The turbulent flow model predicts 69 percent aerosol removal or 31 percent remaining (see Table A-5). The average removal is 67 percent, leaving 33 percent of the aerosol mass to leave the building roof exhaust. Size distribution of the emitted total particulate is given in the last column of Table A-5 and is plotted in Figure A-2. The ten particle size intervals (10 percent by weight in each category) and settling velocity for each used in the deposition calculation for the storage building are as follows:

D-5% = 0.7 μm, settling velocity = 0.002 cm/sec
D-15% = 1.7 μm, settling velocity = 0.01 cm/sec
D-25% = 3.0 μm, settling velocity = 0.03 cm/sec
D-35% = 4.0 μm, settling velocity = 0.05 cm/sec
D-45% = 5.5 μm, settling velocity = 0.09 cm/sec
D-55% = 7.0 μm, settling velocity = 0.15 cm/sec
D-65% = 9.0 μm, settling velocity = 0.25 cm/sec
D-75% = 11.0 μm, settling velocity = 0.37 cm/sec
D-85% = 14.0 μm, settling velocity = 0.59 cm/sec
D-95% = 19.0 μm, settling velocity = 1.09 cm/sec

Table A-5. Estimated Particle-Size Distribution and Control Efficiency for Storage Building Total Sulfur Particulate Emissions

Size Interval (μm)	Mass Fraction in Size Interval (%)	Mass Median Diameter (μm)	Settling Velocity (ft/min)	Removal Efficiency			Aerosol Mass Remaining (%)	Emitted Aerosol Distribution (%)
				Laminar (%)	Turbulent (%)	Average (%)		
120-130	10	160	102	100	100	100	0	--
85-120	10	110	57	100	100	100	0	--
60-85	10	64	23	100	100	100	0	--
44-60	10	52	16	100	99.97	100	0	--
32-44	10	37	8	100	98	99	0.1	0.3
22-32	10	26	4	100	86	93	0.7	2.1
14-22	10	18	2	50*	63	57	4.3	13.0
8-14	10	11	0.7	0	30	15	8.5	25.6
3.5-8	10	6	0.2	0	10	5	9.5	29.0
0-3.5	10	2	0.02	0	2	1	9.9	30.0
	100			65	69	67	33	100.0

*For Dp > 18 μm, η_1 = 100 percent; for Dp < 18 μm, η_1 = 0 percent.

Source: D. Lundgren, 1985.

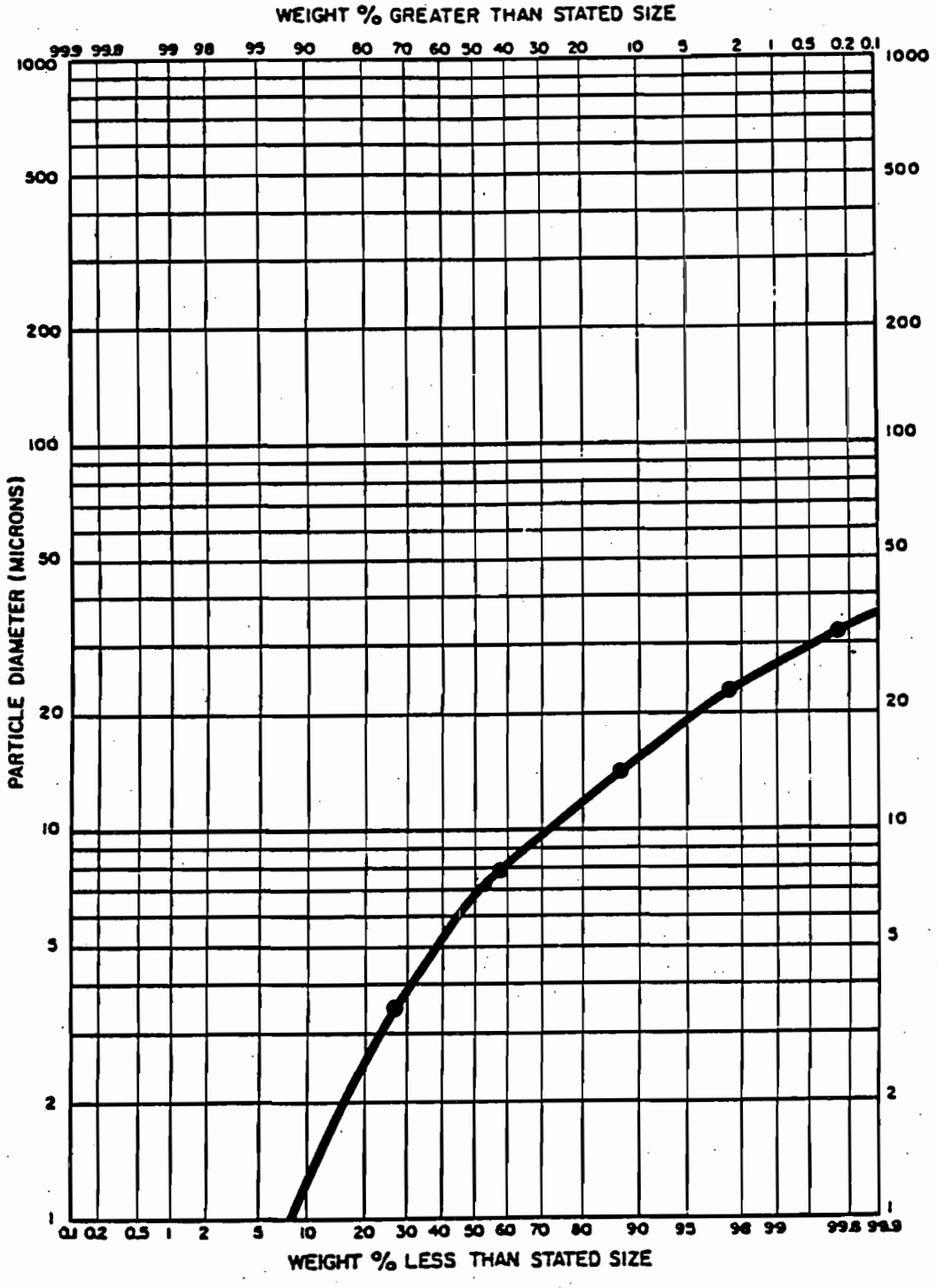

Figure A-2
PARTICLE SIZE DISTRIBUTION FOR FUGITIVE EMISSIONS FROM PRILLED SULFUR (STORAGE BUILDING ONLY)

SOURCE: MRI, 1985.

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APPENDIX B

EXCERPTS FROM AP-42

11.2.3 AGGREGATE HANDLING AND STORAGE PILES

11.2.3.1 General

Inherent in operations that use minerals in aggregate form is the maintenance of outdoor storage piles. Storage piles are usually left uncovered, partially because of the need for frequent material transfer into or out of storage.

Dust emissions occur at several points in the storage cycle, during material loading onto the pile, during disturbances by strong wind currents, and during loadout from the pile. The movement of trucks and loading equipment in the storage pile area is also a substantial source of dust.

11.2.3.2 Emissions and Correction Parameters

The quantity of dust emissions from aggregate storage operations varies with the volume of aggregate passing through the storage cycle. Also, emissions depend on three correction parameters that characterize the condition of a particular storage pile: age of the pile, moisture content and proportion of aggregate fines.

When freshly processed aggregate is loaded onto a storage pile, its potential for dust emissions is at a maximum. Fines are easily disaggregated and released to the atmosphere upon exposure to air currents from aggregate transfer itself or high winds. As the aggregate weathers, however, potential for dust emissions is greatly reduced. Moisture causes aggregation and cementation of fines to the surfaces of larger particles. Any significant rainfall soaks the interior of the pile, and the drying process is very slow.

Field investigations have shown that emissions from aggregate storage operations vary in direct proportion to the percentage of silt (particles < 75 μm in diameter) in the aggregate material.[1 3] The silt content is determined by measuring the proportion of dry aggregate material that passes through a 200 mesh screen, using ASTM-C-136 method. Table 11.2.3-1 summarizes measured silt and moisture values for industrial aggregate materials.

11.2.3.3 Predictive Emission Factor Equations

Total dust emissions from aggregate storage piles are contributions of several distinct source activities within the storage cycle:

1. Loading of aggregate onto storage piles (batch or continuous drop operations).
2. Equipment traffic in storage area.
3. Wind erosion of pile surfaces and ground areas around piles.
4. Loadout of aggregate for shipment or for return to the process stream (batch or continuous drop operations).

TABLE 11.2.3-1. TYPICAL SILT AND MOISTURE CONTENT VALUES OF MATERIALS AT VARIOUS INDUSTRIES

Industry	Material	Silt (%)			Moisture (%)		
		No. of test samples	Range	Mean	No. of test samples	Range	Mean
Iron and steel production[a]	Pellet ore	10	1.4 - 13	4.9	8	0.64 - 3.5	2.1
	Lump ore	9	2.8 - 19	9.5	6	1.6 - 8.1	5.4
	Coal	7	2 - 7.7	5	6	2.8 - 11	4.8
	Slag	3	3 - 7.3	5.3	3	0.25 - 2.2	0.92
	Flue dust	2	14 - 23	18.0	0	NA	NA
	Coke breeze	1		5.4	1		6.4
	Blended ore	1		15.0	1		6.6
	Sinter	1		0.7	0	NA	NA
	Limestone	1		0.4	0	NA	NA
Stone quarrying and processing[b]	Crushed limestone	2	1.3 - 1.9	1.6	2	0.3 - 1.1	0.7
Taconite mining and processing[c]	Pellets	9	2.2 - 5.4	3.4	7	0.05 - 2.3	0.96
	Tailings	2	NA	11.0	1		0.35
Western surface coal mining[d]	Coal	15	3.4 - 16	6.2	7	2.8 - 20	6.9
	Overburden	15	3.8 - 15	7.5	0	NA	NA
	Exposed ground	3	5.1 - 21	15.0	3	0.8 - 6.4	3.4

[a] References 2-5. NA = not applicable.
[b] Reference 1.
[c] Reference 6.
[d] Reference 7.

Adding aggregate material to a storage pile or removing it usually involves dropping the material onto a receiving surface. Truck dumping on the pile or loading out from the pile to a truck with a front end loader are examples of batch drop operations. Adding material to the pile by a conveyor stacker is an example of a continuous drop operation.

The quantity of particulate emissions generated by a batch drop operation, per ton of material transferred, may be estimated, with a rating of C, using the following empirical expression[2]:

$$E = k(0.00090)\ \frac{\left(\frac{s}{5}\right)\left(\frac{U}{2.2}\right)\left(\frac{H}{1.5}\right)}{\left(\frac{M}{2}\right)^2\left(\frac{Y}{4.6}\right)^{0.33}} \quad \text{(kg/Mg)} \qquad \text{(1)}$$

$$E = k(0.0018)\ \frac{\left(\frac{s}{5}\right)\left(\frac{U}{5}\right)\left(\frac{H}{5}\right)}{\left(\frac{M}{2}\right)^2\left(\frac{Y}{6}\right)^{0.33}} \quad \text{(lb/ton)}$$

where: E = emission factor
k = particle size multipler (dimensionless)
s = material silt content (%)
U = mean wind speed, m/s (mph)
H = drop height, m (ft)
M = material moisture content (%)
Y = dumping device capacity, m^3 (yd^3)

The particle size multipler (k) for Equation 1 varies with aerodynamic particle size, shown in Table 11.2.3-2.

TABLE 11.2.3-2. AERODYNAMIC PARTICLE SIZE MULTIPLIER (k) FOR EQUATIONS 1 AND 2

Equation	< 30 μm	< 15 μm	< 10 μm	< 5 μm	< 2.5 μm
Batch drop	0.73	0.48	0.36	0.23	0.13
Continuous drop	0.77	0.49	0.37	0.21	0.11

The quantity of particulate emissions generated by a continuous drop operation, per ton of material transferred, may be estimated, with a rating of C, using the following empirical expression[3]:

$$E = k(0.00090)\ \frac{\left(\frac{s}{5}\right)\left(\frac{U}{2.2}\right)\left(\frac{H}{3.0}\right)}{\left(\frac{M}{2}\right)^2} \quad (kg/Mg) \qquad (2)$$

$$E = k(0.0018)\ \frac{\left(\frac{s}{5}\right)\left(\frac{U}{5}\right)\left(\frac{H}{10}\right)}{\left(\frac{M}{2}\right)^2} \quad (lb/ton)$$

where: E = emission factor
k = particle size multiplier (dimensionless)
s = material silt content (%)
U = mean wind speed, m/s (mph)
H = drop height, m (ft)
M = material moisture content (%)

The particle size multiplier (k) for Equation 2 varies with aerodynamic particle size, as shown in Table 11.2.3-2.

Equations 1 and 2 retain the assigned quality rating if applied within the ranges of source conditions that were tested in developing the equations, as given in Table 11.2.3-3. Also, to retain the quality ratings of Equations 1 or 2 applied to a specific facility, it is necessary that reliable correction parameters be determined for the specific sources of interest. The field and laboratory procedures for aggregate sampling are given in Reference 3. In the event that site specific values for correction parameters cannot be obtained, the appropriate mean values from Table 11.2.3-1 may be used, but in that case, the quality ratings of the equations are reduced by one level.

TABLE 11.2.3-3. RANGES OF SOURCE CONDITIONS FOR EQUATIONS 1 AND 2[a]

Equation	Silt content (%)	Moisture content (%)	Dumping capacity m^3	Dumping capacity yd^3	Drop height m	Drop height ft
Batch drop	1.3 - 7.3	0.25 - 0.70	2.10 - 7.6	2.75 - 10	NA	NA
Continuous drop	1.4 - 19	0.64 - 4.8	NA	NA	1.5 - 12	4.8 - 39

[a] NA = not applicable.

For emissions from equipment traffic (trucks, front end loaders, dozers, etc.) traveling between or on piles, it is recommended that the equations for vehicle traffic on unpaved surfaces be used (see Section 11.2.1). For vehicle travel between storage piles, the silt value(s) for the areas

among the piles (which may differ from the silt values for the stored materials) should be used.

For emissions from wind erosion of active storage piles, the following total suspended particulate (TSP) emission factor equation is recommended:

$$E = 1.9 \left(\frac{s}{1.5}\right) \left(\frac{365-p}{235}\right) \left(\frac{f}{15}\right) \quad \text{(kg/day/hectare)} \qquad (3)$$

$$E = 1.7 \left(\frac{s}{1.5}\right) \left(\frac{365-p}{235}\right) \left(\frac{f}{15}\right) \quad \text{(lb/day/acre)}$$

where: E = total suspended particulate emission factor
s = silt content of aggregate (%)
p = number of days with ≧ 0.25 mm (0.01 in.) of precipitation per year
f = percentage of time that the unobstructed wind speed exceeds 5.4 m/s (12 mph) at the mean pile height

The coefficient in Equation 3 is taken from Reference 1, based on sampling of emissions from a sand and gravel storage pile area during periods when transfer and maintenance equipment was not operating. The factor from Test Report 1, expressed in mass per unit area per day, is more reliable than the factor expressed in mass per unit mass of material placed in storage, for reasons stated in that report. Note that the coefficient has been halved to adjust for the estimate that the wind speed through the emission layer at the test site was one half of the value measured above the top of the piles. The other terms in this equation were added to correct for silt, precipitation and frequency of high winds, as discussed in Reference 2. Equation 3 is rated C for application in the sand and gravel industry and D for other industries.

Worst case emissions from storage pile areas occur under dry windy conditions. Worst case emissions from materials handling (batch and continuous drop) operations may be calculated by substituting into Equations 1 and 2 appropriate values for aggregate material moisture content and for anticipated wind speeds during the worst case averaging period, usually 24 hours. The treatment of dry conditions for vehicle traffic (Section 11.2.1) and for wind erosion (Equation 3), centering around parameter p, follows the methodology described in Section 11.2.1. Also, a separate set of nonclimatic correction parameters and source extent values corresponding to higher than normal storage pile activity may be justified for the worst case averaging period.

11.2.3.4 Control Methods

Watering and chemical wetting agents are the principal means for control of aggregate storage pile emissions. Enclosure or covering of inactive piles to reduce wind erosion can also reduce emissions. Watering is useful mainly to reduce emissions from vehicle traffic in the storage pile area. Watering of the storage piles themselves typically has only a very temporary slight effect on total emissions. A much more effective technique is to apply chemical wetting agents for better wetting of fines and

longer retention of the moisture film. Continuous chemical treatment of material loaded onto piles, coupled with watering or treatment of roadways, can reduce total particulate emissions from aggregate storage operations by up to 90 percent.[8]

References for Section 11.2.3

1. C. Cowherd, Jr., et al., Development of Emission Factors for Fugitive Dust Sources, EPA-450/3-74-037, U. S. Environmental Protection Agency, Research Triangle Park, NC, June 1974.

2. R. Bohn, et al., Fugitive Emissions from Integrated Iron and Steel Plants, EPA-600/2-78-050, U. S. Environmental Protection Agency, Research Triangle Park, NC, March 1978.

3. C. Cowherd, Jr., et al., Iron and Steel Plant Open Dust Source Fugitive Emission Evaluation, EPA-600/2-79-103, U. S. Environmental Protection Agency, Research Triangle Park, NC, May 1979.

4. R. Bohn, Evaluation of Open Dust Sources in the Vicinity of Buffalo, New York, U. S. Environmental Protection Agency, New York, NY, March 1979.

5. C. Cowherd, Jr., and T. Cuscino, Jr., Fugitive Emissions Evaluation, Equitable Environmental Health, Inc., Elmhurst, IL, February 1977.

6. T. Cuscino, et al., Taconite Mining Fugitive Emissions Study, Minnesota Pollution Control Agency, Roseville, MN, June 1979.

7. K. Axetell and C. Cowherd, Jr., Improved Emission Factors for Fugitive Dust from Western Surface Coal Mining Sources, 2 Volumes, EPA Contract No. 68-03-2924, PEDCo Environmental, Inc., Kansas City, MO, July 1981.

8. G. A. Jutze, et al., Investigation of Fugitive Dust Sources Emissions and Control, EPA-450/3-74-036a, U. S. Environmental Protection Agency, Research Triangle Park, NC, June 1974.

11.2.6 INDUSTRIAL PAVED ROADS

11.2.6.1 General

Various field studies have indicated that dust emissions from industrial paved roads are a major component of atmospheric particulate matter in the vicinity of industrial operations. Industrial traffic dust has been found to consist primarily of mineral matter, mostly tracked or deposited onto the roadway by vehicle traffic itself when vehicles enter from an unpaved area or travel on the shoulder of the road, or when material is spilled onto the paved surface from haul truck traffic.

11.2.6.2 Emissions and Correction Parameters

The quantity of dust emissions from a given segment of paved road varies linearly with the volume of traffic. In addition, field investigations have shown that emissions depend on correction parameters (road surface silt content, surface dust loading and average vehicle weight) of a particular road and associated vehicle traffic.[1-2]

Dust emissions from industrial paved roads have been found to vary in direct proportion to the fraction of silt (particles < 75 μm in diameter) in the road surface material.[1-2] The silt fraction is determined by measuring the proportion of loose dry surface dust that passes a 200 mesh screen, using the ASTM-C-136 method. In addition, it has also been found that emissions vary in direct proportion to the surface dust loading.[1-2] The road surface dust loading is that loose material which can be collected by vacuuming and broom sweeping the traveled portion of the paved road. Table 11.2.6-1 summarizes measured silt and loading values for industrial paved roads.

TABLE 11.2.6-1. TYPICAL SILT CONTENT AND LOADING VALUES FOR PAVED ROADS AT IRON AND STEEL PLANTS[a]

Industry	Travel lanes	Silt (%)		Loading			
				Range		Mean	
		Range	Mean	kg/km	lb/mi	kg/km	lb/mi
Iron and steel production	2	1.1 - 13	5.9	18 - 4,800	65 - 17,000	760	2,700

[a] References 1-3. Based on nine test samples.

11.2.6.3 Predictive Emission Factor Equation

The quantity of particulate emissions generated by vehicle traffic on dry industrial paved roads, per vehicle mile traveled, may be estimated, with a rating of B or D (see below), using the following empirical expression:

$$E = k(0.025)I \left(\frac{4}{n}\right) \left(\frac{s}{10}\right) \left(\frac{L}{280}\right) \left(\frac{W}{2.7}\right)^{0.7} \quad \text{(kg/VKT)} \qquad (1)$$

$$E = k(0.090)I \left(\frac{4}{n}\right) \left(\frac{s}{10}\right) \left(\frac{L}{1,000}\right) \left(\frac{W}{3}\right)^{0.7} \quad \text{(lb/VMT)}$$

where: E = emission factor
k = particle size multiplier (dimensionless) (see below)
I = industrial augmentation factor (dimensionless) (see below)
n = number of traffic lanes
s = surface material silt content (%)
L = surface dust loading, kg/km (lb/mile) (see below)
W = average vehicle weight, Mg (tons)

The particle size multipler (k) above varies with aerodynamic size range as follows:

Aerodynamic Particle Size Multiplier (k) for Equation 1

< 30 μm	< 15 μm	< 10 μm	< 5 μm	< 2.5 μm
0.86	0.64	0.51	0.32	0.17

To determine particulate emissions for a specific particle size range, use the appropriate value of k shown above.

The industrial road augmentation factor (I) in the equation takes into account higher emissions from industrial roads than from urban roads. I = 7.0 for an industrial roadway which traffic enters from unpaved areas. I = 3.5 for an industrial roadway with unpaved shoulders. I = 1.0 for cases in which traffic does not travel unpaved areas. A value of I between 1.0 and 7.0 should be used in the equation which best represents conditions for paved roads at a certain industrial facility.

The equation retains the quality rating of B if applied to vehicles traveling entirely on paved surfaces (I = 1.0) and if applied within the range of source conditions that were tested in developing the equation as follows:

Silt content (%)	Surface loading kg/km	Surface loading lb/mile	No. of lanes	Vehicle weight Mg	Vehicle weight tons
5.1 - 92	42.0 - 2,000	149 - 7,100	2 - 4	2.7 - 12	3 - 13

If I > 1.0, the rating of the equation drops to D because of the arbitrariness in the guidelines for estimating I.

Also, to retain the quality ratings of Equation 1 applied to a specific industrial paved road, it is necessary that reliable correction parameter values for the specific road in question be determined. The field and laboratory procedures for determining surface material silt content and surface dust loading are given in Reference 2. In the event that site specific values for correction parameters cannot be obtained, the appropriate mean values from Table 11.2.6-1 may be used, but the quality ratings of the equation are reduced by one level.

References for Section 11.2.6

1. R. Bohn, et al., Fugitive Emissions from Integrated Iron and Steel Plants, EPA-600/2-78-050, U. S. Environmental Protection Agency, Research Triangle Park, NC, March 1978.

2. C. Cowherd, Jr., et al., Iron and Steel Plant Open Dust Source Fugitive Emission Evaluation, EPA-600/2-79-103, U. S. Environmental Protection Agency, Research Triangle Park, NC, May 1979.

3. R. Bohn, Evaluation of Open Dust Sources in the Vicinity of Buffalo, New York, U. S. Environmental Protection Agency, New York, NY, March 1979.

ATTACHMENT 5

Patty,
Agrico file.
a copy has been routed around the office
PR

Agrico
ONE OF THE WILLIAMS COMPANIES

DER
JUN 13 1985
BAQM

June 7, 1985

Mr. Clair H. Fancy
Bureau of Air Quality Management
Department of Environmental Regulation
2652 Executive Center Circle, East
Koger Center, Montgomery Building
Tallahassee, FL 32301

Dear Mr. Fancy:

Re Agrico Chemical Company's Request
to Renew Air Permit No. AC-29-5954

Please find enclosed an executed Waiver of 90-Day Time Limit Under Sections 120.60(2) and 403.0876, Florida Statutes form for the above-referenced permit proceedings.

Without waiving its rights in that proceeding, Agrico has decided to extend the permit review time limit from June 28, 1985 to September 23, 1985. This additional time will allow the Department an opportunity to review an air construction permit modification application which Agrico Chemical Company has filed.

If you have any questions, please feel free to call.

Very truly yours,

H W Long Jr

H.W. Long, Jr.
Manager
Environmental Control

HWL:crl
enclosure
cc: Mr. Vince Snow

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

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

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

DER

JUN 13 1985

BAQM

WAIVER OF 90 DAY TIME LIMIT
UNDER SECTIONS 120.60(2) AND 403.0876, FLORIDA STATUTES

License (Permit, Certification) Application No. AC 29-5954*

Applicant's Name: Agrico Chemical Company

The undersigned has read Sections 120.60(2) and 403.0876, Florida Statutes, and fully understands the applicant's rights under that section.

With regard to the above reference license (permit, certification) application, the applicant hereby with full knowledge and understanding of ~~(his)~~ ~~(her)~~ (its) rights under Sections 120.60(2) and 403.0876, Florida Statutes, waives the right under Sections 120.60(2) and 403.0876, Florida Statutes, to have the application approved or denied by the State of Florida Department of Environmental Regulation within the 90 day time period prescribed in Sections 120.60(2) and 403.0876, Florida Statutes. Said waiver is made freely and voluntarily by the applicant, is in (his) (her) (its) self-interest, and without any pressure or coercion by anyone employed by the State of Florida Department of Environmental Regulation.

This waiver shall expire on the 23rd day of September 19 85.

The undersigned is authorized to make this waiver on behalf of the applicant.

* Re Extension Letter to DER--June 4, 1984

Harold W Long Jr
Signature

Harold W. Long, Jr.
Please Type Name of Signee

June 7, 1985
Date

Sworn to and subscribed
before me this 7th day
of June, 1985.

Gloria N. Cosey
Notary Public State of Florida at Large
My Commission Exp. Dec. 9, 1987

GLORIA N. COSEY NOTARY PUBLIC STATE OF FLORIDA

DER Form 17-1.201(8)
Effective November 30, 1982

Section 120.60, Florida Statutes

(2) When an application for a license is made as required by law, the agency shall conduct the proceedings required with reasonable dispatch and with due regard to the rights and privileges of all affected parties or aggrieved persons. Within 30 days after receipt of an application for a license, the agency shall examine the application, notify the applicant of any apparent errors or omissions, and request any additional information the agency is permitted by law to require. Failure to correct an error or omission or to supply additional information shall not be grounds for denial of the license unless the agency timely notified the applicant within this 30 day period. The agency shall notify the applicant if the activity for which he seeks a license is exempt from the licensing requirement and return any tendered application fee within 30 days after receipt of the original application or within 10 days after receipt of the timely requested additional information or correction of errors or omissions. Every application for license shall be approved or denied within 90 days after receipt of the original application or receipt of the timely requested additional information or correction of errors or omissions unless a shorter period of time for agency action is provided by law. The 90-day or shorter time period shall be tolled by the initiation of a proceeding under Section 120.57 and shall resume 10 days after the recommended order is submitted to the agency and the parties. Any application for a license not approved or denied within the 90-day period or shorter time period, within 15 days after conclusion of a public hearing held on the application, or within 45 days after the recommended order is submitted to the agency and the parties, whichever is latest, shall be deemed approved and, subject to the satisfactory completion of an examination, if required as prerequisite to licensure, the license shall be issued. The Public Service Commission, when issuing a license, and any other agency, if specifically exempted by law, shall be exempt from the time limitations within this subsection. Each agency, upon issuing or denying a license, shall state with particularity the grounds or basis for the issuance or denial of same, except where issuance is a ministerial act. On denial of a license application on which there has been no hearing, the denying agency shall inform the applicant of any right to a hearing pursuant to Section 120.57.

Section 403.0876, Florida Statutes

Permits; processing. ---Within 30 days after receipt of an application for a permit under this chapter, the department shall review the application and shall request submittal of all additional information the department is permitted by law to require. If the applicant believes any departmental request for additional information is not authorized by law or departmental rule, the applicant may request a hearing pursuant to s. 120.57. Within 30 days after receipt of such additional information, the department shall review it and may request only that information needed to clarify such additional information or to answer new questions raised by or directly related to such additional information. If the applicant believes the request of the department for such additional information is not authorized by law or departmental rule, the department, at the aplicant's request, shall proceed to process the permit application. Permits shall be approved or denied within 90 days after receipt of the original application, the last item of timely requested additional material, or the applicant's written request to begin processing the permit application.

Agrico
ONE OF THE WILLIAMS COMPANIES

DER

JUN 13 1985

BAQM

June 7, 1985

Mr. Clair H. Fancy
Bureau of Air Quality Management
Department of Environmental Regulation
2652 Executive Center Circle, East
Koger Center, Montgomery Building
Tallahassee, FL 32301

Dear Mr. Fancy:

Re Agrico Chemical Company's Request
to Modify Air Permit No. AC-29-5954

Please find enclosed an executed Waiver of 90-Day Time Limit Under Sections 120.60(2) and 403.0876, Florida Statutes form for the above-referenced permit proceedings.

Without waiving its rights in that proceeding, Agrico has decided to extend the permit review time limit to September 23, 1985. This additional time will allow the Department an opportunity to review the air construction permit modification application, which Agrico Chemical Company has filed.

If you have any questions, please feel free to call.

Very truly yours,

H.W. Long

H.W. Long, Jr.
Manager
Environmental Control

HWL:crl
enclosure
cc: Mr. Vince Snow
Mr. Victor San Augustine w/encl.
(Hillsborough Co. EPC)

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

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

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

DER

JUN 13 1985

BAQM

WAIVER OF 90 DAY TIME LIMIT
UNDER SECTIONS 120.60(2) AND 403.0876, FLORIDA STATUTES

License (Permit, Certification) Application No. AC 29-5954 Modification*

Applicant's Name: Agrico Chemical Company

The undersigned has read Sections 120.60(2) and 403.0876, Florida Statutes, and fully understands the applicant's rights under that section.

With regard to the above reference license (permit, certification) application, the applicant hereby with full knowledge and understanding of ~~(his)~~ ~~(her)~~ (its) rights under Sections 120.60(2) and 403.0876, Florida Statutes, waives the right under Sections 120.60(2) and 403.0876, Florida Statutes, to have the application approved or denied by the State of Florida Department of Environmental Regulation within the 90 day time period prescribed in Sections 120.60(2) and 403.0876, Florida Statutes. Said waiver is made freely and voluntarily by the applicant, is in (his) (her) (its) self-interest, and without any pressure or coercion by anyone employed by the State of Florida Department of Environmental Regulation.

This waiver shall expire on the 23rd day of September 19 85.

The undersigned is authorized to make this waiver on behalf of the applicant.

* Submitted October 12, 1984

Harold W. Long, Jr.
Signature

Harold W. Long, Jr.
Please Type Name of Signee

June 7, 1985
Date

Sworn to and subscribed
before me this 7th day
of June 1985.

Gloria D. Casey
Notary Public State of Florida at Large
My Commission Expires Dec. 9, 1987

DER Form 17-1.201(8)
Effective November 30, 1982

Section 120.60, Florida Statutes

(2) When an application for a license is made as required by law, the agency shall conduct the proceedings required with reasonable dispatch and with due regard to the rights and privileges of all affected parties or aggrieved persons. Within 30 days after receipt of an application for a license, the agency shall examine the application, notify the applicant of any apparent errors or omissions, and request any additional information the agency is permitted by law to require. Failure to correct an error or omission or to supply additional information shall not be grounds for denial of the license unless the agency timely notified the applicant within this 30 day period. The agency shall notify the applicant if the activity for which he seeks a license is exempt from the licensing requirement and return any tendered application fee within 30 days after receipt of the original application or within 10 days after receipt of the timely requested additional information or correction of errors or omissions. Every application for license shall be approved or denied within 90 days after receipt of the original application or receipt of the timely requested additional information or correction of errors or omissions unless a shorter period of time for agency action is provided by law. The 90-day or shorter time period shall be tolled by the initiation of a proceeding under Section 120.57 and shall resume 10 days after the recommended order is submitted to the agency and the parties. Any application for a license not approved or denied within the 90-day period or shorter time period, within 15 days after conclusion of a public hearing held on the application, or within 45 days after the recommended order is submitted to the agency and the parties, whichever is latest, shall be deemed approved and, subject to the satisfactory completion of an examination, if required as prerequisite to licensure, the license shall be issued. The Public Service Commission, when issuing a license, and any other agency, if specifically exempted by law, shall be exempt from the time limitations within this subsection. Each agency, upon issuing or denying a license, shall state with particularity the grounds or basis for the issuance or denial of same, except where issuance is a ministerial act. On denial of a license application on which there has been no hearing, the denying agency shall inform the applicant of any right to a hearing pursuant to Section 120.57.

Section 403.0876, Florida Statutes

Permits; processing. ---Within 30 days after receipt of an application for a permit under this chapter, the department shall review the application and shall request submittal of all additional information the department is permitted by law to require. If the applicant believes any departmental request for additional information is not authorized by law or departmental rule, the applicant may request a hearing pursuant to s. 120.57. Within 30 days after receipt of such additional information, the department shall review it and may request only that information needed to clarify such additional information or to answer new questions raised by or directly related to such additional information. If the applicant believes the request of the department for such additional information is not authorized by law or departmental rule, the department, at the aplicant's request, shall proceed to process the permit application. Permits shall be approved or denied within 90 days after receipt of the original application, the last item of timely requested additional material, or the applicant's written request to begin processing the permit application.

de la PARTE, GILBERT AND GRAMOVOT, P. A.
ATTORNEYS AT LAW

EDWARD M. CHEW
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705 EAST KENNEDY BOULEVARD
TAMPA, FLORIDA 33602-5011
(813) 229-2775

May 6, 1985

DER
MAY 1985
BAQM

Mr. Edward T. Huck
Environmental Engineer
Department of Environmental
Regulation, BAQM
Montgomery Building
2670 Executive Center Circle West
Tallahassee, Florida 32301

Re: Agrico Chemical Company's Request to Modify Air Construction Permit No. 29-5954 (Big Bend Prilled Sulfur Installation)

Dear Ed:

Enclosed are three copies of a report prepared by our consultant, Environmental Science and Engineering, Inc., in connection with the above-referenced permit application. The report assesses the anticipated air quality impact of the proposed installation on the particulate matter ambient air quality standard. Also, the report evaluates the sulfur deposition anticipated from the proposed installation. The report utilizes emission factors, emission estimates, air quality models and deposition models compatible with what is required under Florida Administrative Code Rules 17-2.215 and 17-2.540. Please let me know if your staff desires copies of the supporting computer print-outs.

Also enclosed for your consideration are three copies of a letter from Jacobs Engineering confirming the fact that wind-activated louvers will be installed on the sulfur storage building. This will serve to assure the Department that emissions from the building will only be released through the roof vents.

The attached report contains information for both air-formed and wet-formed prills. Both these forms will meet the criteria for standard sulfur pellets as specified in Florida Administrative Code Rule 17-2.100(179). To the extent the existing air construction permit and the application filed in October, 1984 limits Agrico Chemical Company to handling wet-formed prills, we request that these documents

be amended. Since the air quality impacts anticipated from both these forms of sulfur was discussed beforehand with the Department and evaluated in the report, there should be no need to delay the permit review process.

In our opinion, this information completes the application and should be sufficient to permit the Department to conclude its review of this matter. If you or any other Department employee should have questions about matters discussed in this letter or addressed in the report, please don't hesitate to contact me.

Sincerely,

de la PARTE, GILBERT AND
GRAMOVOT, P.A.

Edward de la Parte

Edward P. de la Parte, Jr.

EPdlP/mas
Enclosures
cc: Harold Long
Don Morrow

AN RSH COMPANY

ENVIRONMENTAL SCIENCE
AND ENGINEERING, INC.

May 4, 1985
ESE No. 84-148-0102-2110

Mr. Edward P. de la Parte
De La Parte and Gilbert, P.A.
705 East Kennedy Blvd.
Tampa, FL 33602-5011

Dear Ed:

I have enclosed for your review the final draft of the Big Bend Ambient Air Quality Assessment report. Due to the numerous changes and new information added to the document, I would recommend a final review by all parties before submission to FDER. We can provide as many copies of the final document as you desire. Also, please advise me on submission of supportive computer model printouts.

Sincerely,

David A. Buff/sb

David A. Buff, P.E.

DAB/tdw

Enclosure

cc: Ed Mayer
Harold Long
Dale Lundgren
Kenneth Noll

P.O. Box ESE Gainesville, Florida 32602 904/332-3318 TWX 810-825-6310

JACOBS ENGINEERING GROUP INC.

POST OFFICE BOX 2008 HIGHWAY 98S STATE ROAD 540 LAKELAND, FLORIDA 33806 - 2008
TELEPHONE (813) 665-1511 TELEX 52-2466 JACOBSENG LKL TELECOPIER (813) 665-5323

April 18, 1985

Mr. Vincent A. Snow
Engineering Manager
Agrico Chemical Company
South Pierce Chemical Works
P.O. Box 1969
Bartow, FL 33830

Dear Mr. Snow

Subject: Sulfur Storage Building
Big Bend Terminal
JEG No. 28-4773

Confirming our telephone conversation of April 17, we have reviewed this application for control of sulfur dust emission and are of the opinion that the design of a satisfactory system is technically feasible.

We expect that the system would provide sensing the exiting air velocity through the ridge ventilators and control of the side louvers. Optional ridge ventilation opening control can be provided. The system would adjust the proper side louvers based on prevailing wind direction.

If there are any questions please contact us. We look forward to working with you on the project.

Very truly yours,

JACOBS ENGINEERING GROUP INC.

W. Dan Sheppard

W. Dan Sheppard
Control Systems Engineer

WDS:aea

bcc: S.B. Milligan
N.F. Curran
R.K. Watkins
R.M. Fuller
G. Crespo

Agrico
ONE OF THE WILLIAMS COMPANIES

March 15, 1985

Mr. Clair H. Fancy
Bureau of Air Quality Management
Department of Environmental Regulation
2652 Executive Center Circle, East
Koger Center, Montgomery Building
Tallahassee, FL 32301

Dear Mr. Fancy:

Re Agrico Chemical Company's Request
to Renew Air Permit No. AC-29-5954

Please find enclosed an executed Waiver of 90-Day Time Limit Under Sections 120.60(2) and 403.0876, Florida Statutes form for the above-referenced permit proceedings.

Without waiving its rights in that proceeding, Agrico has decided to extend the permit review time limit from March 31, 1985 to June 28, 1985. This additional time will allow the Department an opportunity to review an air construction permit modification application which Agrico Chemical Company has filed.

If you have any questions, please feel free to call.

Very truly yours,

H. W. Long, Jr.
Manager
Environmental Control

HWL/jm
Enclosure

cc: Mr. D. R. Morrow w/encl.

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

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

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

D. E. R.

MAR 15 1985

SOUTH WEST DISTRICT
TAMPA

WAIVER OF 90 DAY TIME LIMIT
UNDER SECTIONS 120.60(2) AND 403.0876, FLORIDA STATUTES

License (Permit, ~~Certification~~) Application No. AC 29-5954*

Applicant's Name: Agrico Chemical Company

The undersigned has read Sections 120.60(2) and 403.0876, Florida Statutes, and fully understands the applicant's rights under that section.

With regard to the above reference license (permit, ~~certification~~) application, the applicant hereby with full knowledge and understanding of ~~his~~ (her) (its) rights under Sections 120.60(2) and 403.0876, Florida Statutes, waives the right under Sections 120.60(2) and 403.0876, Florida Statutes, to have the application approved or denied by the State of Florida Department of Environmental Regulation within the 90 day time period prescribed in Sections 120.60(2) and 403.0876, Florida Statutes. Said waiver is made freely and voluntarily by the applicant, is in ~~his~~ (her) (its) self-interest, and without any pressure or coercion by anyone employed by the State of Florida Department of Environmental Regulation.

This waiver shall expire on the 28th day of June 19 85.

The undersigned is authorized to make this waiver on behalf of the applicant.

* Re Extension Letter to DER--June 4, 1984

Don R Morrow
Signature

Don R. Morrow
Please Type Name of Signee

March 15, 1985
Date

Sworn to and subscribed
before me this 15th day
of March 19 85.

Gloria N. Causey
Notary Public, State of Florida at Large
My Commission Expires Dec. 9, 1987

GLORIA N. CAUSEY NOTARY PUBLIC STATE OF FLORIDA AT LARGE

DER Form 17-1.201(8)
Effective November 30, 1982

Section 120.60, Florida Statutes

(2) When an application for a license is made as required by law, the agency shall conduct the proceedings required with reasonable dispatch and with due regard to the rights and privileges of all affected parties or aggrieved persons. Within 30 days after receipt of an application for a license, the agency shall examine the application, notify the applicant of any apparent errors or omissions, and request any additional information the agency is permitted by law to require. Failure to correct an error or omission or to supply additional information shall not be grounds for denial of the license unless the agency timely notified the applicant within this 30 day period. The agency shall notify the applicant if the activity for which he seeks a license is exempt from the licensing requirement and return any tendered application fee within 30 days after receipt of the original application or within 10 days after receipt of the timely requested additional information or correction of errors or omissions. Every application for license shall be approved or denied within 90 days after receipt of the original application or receipt of the timely requested additional information or correction of errors or omissions unless a shorter period of time for agency action is provided by law. The 90-day or shorter time period shall be tolled by the initiation of a proceeding under Section 120.57 and shall resume 10 days after the recommended order is submitted to the agency and the parties. Any application for a license not approved or denied within the 90-day period or shorter time period, within 15 days after conclusion of a public hearing held on the application, or within 45 days after the recommended order is submitted to the agency and the parties, whichever is latest, shall be deemed approved and, subject to the satisfactory completion of an examination, if required as prerequisite to licensure, the license shall be issued. The Public Service Commission, when issuing a license, and any other agency, if specifically exempted by law, shall be exempt from the time limitations within this subsection. Each agency, upon issuing or denying a license, shall state with particularity the grounds or basis for the issuance or denial of same, except where issuance is a ministerial act. On denial of a license application on which there has been no hearing, the denying agency shall inform the applicant of any right to a hearing pursuant to Section 120.57.

Section 403.0876, Florida Statutes

Permits; processing. ---Within 30 days after receipt of an application for a permit under this chapter, the department shall review the application and shall request submittal of all additional information the department is permitted by law to require. If the applicant believes any departmental request for additional information is not authorized by law or departmental rule, the applicant may request a hearing pursuant to s. 120.57. Within 30 days after receipt of such additional information, the department shall review it and may request only that information needed to clarify such additional information or to answer new questions raised by or directly related to such additional information. If the applicant believes the request of the department for such additional information is not authorized by law or departmental rule, the department, at the aplicant's request, shall proceed to process the permit application. Permits shall be approved or denied within 90 days after receipt of the original application, the last item of timely requested additional material, or the applicant's written request to begin processing the permit application.

Agrico

ONE OF THE WILLIAMS COMPANIES

January 15, 1985

Mr. Clair H. Fancy
Bureau of Air Quality Management
Department of Environmental Regulation
2652 Executive Center Circle, East
Koger Center, Montgomery Building
Tallahassee, FL 32301

Dear Mr. Fancy:

Re Agrico Chemical Company's Request
to Renew Air Permit No. AC-29-5954

Please find enclosed an executed Waiver of 90-Day Time Limit Under Sections 120.60(2) and 403.0876, Florida Statutes form for the above-referenced permit proceedings.

Without waiving its rights in that proceeding, Agrico has decided to extend the permit review time limit from January 31, 1985, to March 31, 1985. This additional time will allow the Department an opportunity to review an air construction permit modification application, which Agrico Chemical Company has filed.

If you have any questions, please feel free to call.

Very truly yours,

H. W. Long, Jr.
Manager, Environmental Control

HWL:GNC
Enclosure

cc: Mr. Don R. Morrow w/encl.

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

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

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

WAIVER OF 90 DAY TIME LIMIT
UNDER SECTIONS 120.60(2) AND 403.0876, FLORIDA STATUTES

License (Permit, Certification) Application No. AC 29-5954*

Applicant's Name: Agrico Chemical Company

The undersigned has read Sections 120.60(2) and 403.0876, Florida Statutes, and fully understands the applicant's rights under that section.

With regard to the above reference license (permit, certification) application, the applicant hereby with full knowledge and understanding of (his) (her) (its) rights under Sections 120.60(2) and 403.0876, Florida Statutes, waives the right under Sections 120.60(2) and 403.0876, Florida Statutes, to have the application approved or denied by the State of Florida Department of Environmental Regulation within the 90 day time period prescribed in Sections 120.60(2) and 403.0876, Florida Statutes. Said waiver is made freely and voluntarily by the applicant, ia in (his) (her) (its) self-interest, and without any pressure or coercion by anyone employed by the State of Florida Department of Environmental Regulation.

This waiver shall expire on the 31st day of March 1985.

The undersigned is authorized to make this waiver on behalf of the applicant.

*Re Extension Letter to DER--June 4, 1984

Don R Morrow
Signature

Don R. Morrow
Please Type Name of Signee

January 15, 1985
Date

Sworn to and subscribed before me this 15th day of January, 1985.

Gloria N. Casanya
Notary Public State of Florida at Large
My Commission Expires Dec. 9, 1987

DER Form 17-1.201(8)
Effective November 30, 1982

Agrico
ONE OF THE WILLIAMS COMPANIES

January 15, 1985

Mr. Clair H. Fancy
Bureau of Air Quality Management
Department of Environmental Regulation
2652 Executive Center Circle, East
Koger Center, Montgomery Building
Tallahassee, FL 32301

Dear Mr. Fancy:

Re Agrico Chemical Company's Request
to Modify Air Permit No. AC-29-5954

Please find enclosed an executed Waiver of 90-Day Time Limit Under Sections 120.60(2) and 403.0876, Florida Statutes form for the above-referenced permit proceedings.

Without waiving its rights in that proceeding, Agrico has decided to extend the permit review time limit to March 31, 1985. This additional time will allow the Department an opportunity to review the air construction permit modification application, which Agrico Chemical Company has filed.

If you have any questions, please feel free to call.

Very truly yours,

H. W. Long, Jr.
Manager, Environmental Control

HWL:GNC
Enclosure

cc: Mr. Don R. Morrow w/encl.

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

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

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

WAIVER OF 90 DAY TIME LIMIT
UNDER SECTIONS 120.60(2) AND 403.0876, FLORIDA STATUTES

License (Permit, Certification) Application No. AC 29-5954 Modification*

Applicant's Name: Agrico Chemical Company

The undersigned has read Sections 120.60(2) and 403.0876, Florida Statutes, and fully understands the applicant's rights under that section.

With regard to the above reference license (permit, certification) application, the applicant hereby with full knowledge and understanding of (his) (her) (its) rights under Sections 120.60(2) and 403.0876, Florida Statutes, waives the right under Sections 120.60(2) and 403.0876, Florida Statutes, to have the application approved or denied by the State of Florida Department of Environmental Regulation within the 90 day time period prescribed in Sections 120.60(2) and 403.0876, Florida Statutes. Said waiver is made freely and voluntarily by the applicant, is in (his) (her) (its) self-interest, and without any pressure or coercion by anyone employed by the State of Florida Department of Environmental Regulation.

This waiver shall expire on the 31st day of March 19 85.

The undersigned is authorized to make this waiver on behalf of the applicant.

*Submitted October 12, 1984

Don R. Morrow
Signature

Don R. Morrow
Please Type Name of Signee

January 15, 1985
Date

Sworn to and subscribed before me this 15th day of January 1985.

Gloria N. Casey
Notary Public, State of Florida at Large
My Commission Expires Dec. 9, 1987

DER Form 17-1.201(8)
Effective November 30, 1982

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

SOUTHWEST DISTRICT

7601 HIGHWAY 301 NORTH
TAMPA, FLORIDA 33610

WAIVER OF 90 DAY TIME LIMIT
UNDER SECTIONS 120.60(2) AND 403.0876, FLORIDA STATUTES

License (Permit, Certification) Application No. AC 29-5954*

Applicant's Name: Agrico Chemical Company

The undersigned has read Sections 120.60(2) and 403.0876, Florida Statutes, and fully understands the applicant's rights under that section.

With regard to the above reference license (permit, ~~certification~~) application, the applicant hereby with full knowledge and understanding of ~~(his)~~ ~~(her)~~ (its) rights under Sections 120.60(2) and 403.0876, Florida Statutes, waives the right under Sections 120.60(2) and 403.0876, Florida Statutes, to have the application approved or denied by the State of Florida Department of Environmental Regulation within the 90 day time period prescribed in Sections 120.60(2) and 403.0876, Florida Statutes. Said waiver is made freely and voluntarily by the applicant, is in ~~(his)~~ ~~(her)~~ (its) self-interest, and without any pressure or coercion by anyone employed by the State of Florida Department of Environmental Regulation.

This waiver shall expire on the 31st day of January 19 85.

The undersigned is authorized to make this waiver on behalf of the applicant.

*Re: Extension letter to DER - June 4, 1984

GLORIA N. CSANYI NOTARY PUBLIC STATE OF FLORIDA AT LARGE

Sworn to and subscribed
before me this 29th day
of November 1984.

Gloria N. Csanyi
Notary Public State of Florida at Large
My Commission Expires Dec. 9, 1987

Don R Morrow
Signature

Don R. Morrow
Please Type Name of Signee

November 29, 1984
Date

DER Form 17-1.201(8)
Effective November 30, 1982

Section 120.60, Florida Statutes

(2) When an application for a license is made as required by law, the agency shall conduct the proceedings required with reasonable dispatch and with due regard to the rights and privileges of all affected parties or aggrieved persons. Within 30 days after receipt of an application for a license, the agency shall examine the application, notify the applicant of any apparent errors or omissions, and request any additional information the agency is permitted by law to require. Failure to correct an error or omission or to supply additional information shall not be grounds for denial of the license unless the agency timely notified the applicant within this 30 day period. The agency shall notify the applicant if the activity for which he seeks a license is exempt from the licensing requirement and return any tendered application fee within 30 days after receipt of the original application or within 10 days after receipt of the timely requested additional information or correction of errors or omissions. Every application for license shall be approved or denied within 90 days after receipt of the original application or receipt of the timely requested additional information or correction of errors or omissions unless a shorter period of time for agency action is provided by law. The 90-day or shorter time period shall be tolled by the initiation of a proceeding under Section 120.57 and shall resume 10 days after the recommended order is submitted to the agency and the parties. Any application for a license not approved or denied within the 90-day period or shorter time period, within 15 days after conclusion of a public hearing held on the application, or within 45 days after the recommended order is submitted to the agency and the parties, whichever is latest, shall be deemed approved and, subject to the satisfactory completion of an examination, if required as prerequisite to licensure, the license shall be issued. The Public Service Commission, when issuing a license, and any other agency, if specifically exempted by law, shall be exempt from the time limitations within this subsection. Each agency, upon issuing or denying a license, shall state with particularity the grounds or basis for the issuance or denial of same, except where issuance is a ministerial act. On denial of a license application on which there has been no hearing, the denying agency shall inform the applicant of any right to a hearing pursuant to Section 120.57.

Section 403.0876, Florida Statutes

Permits; processing. ---Within 30 days after receipt of an application for a permit under this chapter, the department shall review the application and shall request submittal of all additional information the department is permitted by law to require. If the applicant believes any departmental request for additional information is not authorized by law or departmental rule, the applicant may request a hearing pursuant to s. 120.57. Within 30 days after receipt of such additional information, the department shall review it and may request only that information needed to clarify such additional information or to answer new questions raised by or directly related to such additional information. If the applicant believes the request of the department for such additional information is not authorized by law or departmental rule, the department, at the aplicant's request, shall proceed to process the permit application. Permits shall be approved or denied within 90 days after receipt of the original application, the last item of timely requested additional material, or the applicant's written request to begin processing the permit application.

Agrico
ONE OF THE WILLIAMS COMPANIES

December 17, 1984

Mr. C. H. Fancy, P.E.
Deputy Chief
Department of Environmental Regulation
Bureau of Air Quality Management
2652 Executive Center Circle E.
Koger Center, Montgomery Building
Tallahassee, FL 32301

Dear Mr. Fancy:

On October 12, 1984 Agrico submitted a modification request to the Bureau regarding permit AC 29-5954 for our proposed sulfur prill terminal operation at Big Bend Terminal in Hillsborough County.

On November 6, 1984 you informed Agrico that the Bureau had determined our application incomplete and requested Agrico to supply additional information so processing of our modification request could resume. The attached is our response to your requested additional information. If you require further information, please contact me.

Very truly yours,

H. W. Long, Jr.

H. W. Long, Jr.
Manager
Environmental Control

HWL/jm
Attachment

cc: Mr. D. R. Morrow
Mr. E. P. de la Parte, Jr.

1) Modification of specific condition 8 - It will be necessary to define the moisture content of the sulfur prill when it arrives at the facility and prior to leaving the facility; the method of testing; record retention of moisture levels and how you will adjust the moisture level, if necessary.

Moisture content of the sulfur prill when it arrives at the facility is dependent on average moisture content at loadout, trip distance, duration of trip and pile draindown during trip. To define a definite moisture content upon arrival is not feasible. The moisture should be defined as a range of the top three (3) feet of each hold load. This should range between one (1) and two (2) percent. The lower you go into the pile in the hold, the higher the moisture content will be.

Agrico can specify an average moisture content of the total shipment, by contract agreement. The shipper would monitor the loadout and report the average moisture content to Agrico.

Moisture content of the prilled sulfur leaving the facility would depend on final destination. The material shipped to South Pierce Chemical Works would average three (3) percent moisture.

The unloading of the sulfur prill material is two-fold. One is to unload the cargo in minimum time so as not to incur demurrage. The other is to unload in an environmentally sound manner, with minimal particulate emissions. Testing and any moisture adjustment should be based upon observed particulate emissions that could occur at the clamshell unload hopper.

1) The testing of moisture content during dockside unloading should follow the below listed procedure:

. . Remove hatch cover from initial hold to be unloaded.

. . Thief sulfur pile at the four (4) corners and three (3) points in center to a depth of three to four feet.

. . Composite, riffle or cone and quarter sample to obtain 50 gram representative samples.

. . Dry duplicate samples in calibrated microwave oven to determine percent moisture.

. . Once moisture has been determined, observe unload hopper particulate emissions. If emission is greater than 10 percent opacity, adjust the moisture content of the removal area with dockside fine spray addition to that area.

. . Continue water addition to removal area until emission is reduced to the 5 percent opacity level.

. . Each hold to be unloaded should follow same procedure.

Once the material is unloaded to the hopper, the proposed transfer system to storage has the capability to add approximately 0.5 percent moisture to the average unload tonnage.

The testing of the moisture content during storage loadout should follow the below listed procedure:

. . Based on material destination or contract specification, the moisture content of the area to be loaded out should be sampled before removal.

. . The area of the storage pile to be loaded should be thiefed at five representative locations.

1) . . Composite, riffle or cone and quarter sample to obtain 50 gram representative samples.

. . Dry duplicate samples in calibrated microwave to determine percent moisture.

Based on destination or contract specification, moisture content of the material to be loaded can be adjusted, if required, as follows:

(1) Proposed transfer system has the capability to add approximately 0.62 percent moisture to the average loadout tonnage.

(2) Storage spray system could be utilized to make any initial moisture adjustments required.

This procedure for moisture determination of pile loadout area should be continued at proper intervals to assure required moisture at truck loadout.

During loadout, samples should be collected at the belt discharge to the hopper or at truck loadout. These samples should be collected at proper intervals to assure average and individual moisture content of material loaded. Same sample preparation and moisture determination, as outlined above, should be followed. Samples collected at this point could be composited to determine average moisture content of material shipped.

All moisture determinations would be made at the Big Bend facility and the moisture records retained on site for three years in a dedicated file area.

2) In respect to the proposed structure to enclose the prill storage pile - please provide calculation(s) to verify the 3 percent unconfined dust level anticipated to be released in the atmosphere; the proposed building ventilation system configuration; define the anticipated effect on the ambient atmosphere outside the structure from the ventilation system.

Attachements 20, 21 and 22 provide data on expected emission reduction by enclosure of a storage pile. They display a range of 95 to 99 percent emission reduction. Based on consultant experience and best engineering judgment, we selected 97 percent emission reduction.

No continuous flow ventilation is provided for the sulfur storage building. There will be two (2) openings for the receiving and reclaim conveyors to penetrate the walls. The open area can be kept to a minimum with man doors next to the conveyors for plant personnel. There will be two (2) 20'x20' overhead doors for frontend loader access, one door on the south end and one door on the north end. There will be four (4) 20'x16' overhead doors on the east side, outboard of the reclaim conveyor. These doors will be used for ventilating the building from time to time.

The anticipated effect on the ambient atmosphere outside the structure from the ventilation system would be 0.411 lbs./hr. particulate emission.

3) In respect to the proposed truck load - out area - (a) will the structure be completely enclosed? (b) define the anticipated emissions to the outside atmosphere relative to points 8 and 9 on attachment #7. (c) will this area constitute a point source of particulate emissions?

(a) The load out structure will be totally enclosed except for the entrance and exit openings for trucks on each end. The sides will extend to the ground.

(b) The anticipated emissions to the outside atmosphere for points 8 and 9 are 0.594 lbs./hr. of particulate. This is based on 2% moisture in the prill and water spray addition at point 7.

(c) This area constitutes an unconfined fugitive emission source.

4) In respect to the receiving hopper - provide information on the type of enclosure and anticipated vented emissions to the ambient atmosphere.

The shipunloader receiving hopper will be enclosed with a steel plate wind shield on three (3) sides. The fourth side will be open for access of the unloading clamshell.

The anticipated emissions to the ambient atmosphere is 0.187 lbs./hr. of particulate. This rate is based on 2% moisture in received prill and water spray additions at the receiving hopper. (See Attachments 18 and 19 of modified permit application.)

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301-8241

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

November 6, 1984

CERTIFIED MAIL - RECEIPT REQUESTED

Mr. Harold Long, Jr.
Agrico Mining Company
P. O. Box 1110
Mulberry, Florida 33860

Dear Mr. Long:

The Bureau of Air Quality Management has reviewed your request for modification submitted on October 12, 1984 in regards to permit AC 29-5954 for your proposed Sulfur Prill Terminal for ship unloading, transfer, storage and truck loading at your Big Bend Facility in Hillsborough County. We have determined that your application is incomplete. The following information is necessary before we can resume processing of your modification:

1) Modification of specific condition 8 - It will be necessary to define the moisture content of the sulfur prill when it arrives at the facility and prior to leaving the facility; the method of testing; record retention of moisture levels and how you will adjust the moisture level, if necessary.

2) In respect to the proposed structure to enclose the prill storage pile - please provide calculation(s) to verify the 3 percent unconfined dust level anticipated to be released in the atmosphere; the proposed building ventilation system configuration; define the anticipated effect on the ambient atmosphere outside the structure from the ventilation system.

3) In respect to the proposed truck load - out area- (a) will the structure be completely enclosed? (b) define the anticipated emissions to the outside atmosphere relative to points 8 and 9 on attachment #7. (c) will this area constitute a point source of particulate emissions?

4) In respect to the receiving hopper - provide information on the type of enclosure and anticipated vented emissions to the ambient atmosphere.

When the requested information is received, we will resume the processing of your requested modification. If you require further information, please contact Edward T. Huck at (904) 488-1344 or write to me at the above address.

Sincerely,

C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality
Management

CHF/EH/cmr

cc: Steve Smallwood
Bill Thomas
Walt Starnes

No. 0155770

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED— NOT FOR INTERNATIONAL MAIL

(See Reverse)

SENT TO Mr. Harold Long, Jr.		
STREET AND NO.		
P.O., STATE AND ZIP CODE		
POSTAGE		$
CONSULT POSTMASTER FOR FEES	CERTIFIED FEE	¢
OPTIONAL SERVICES	SPECIAL DELIVERY	¢
	RESTRICTED DELIVERY	¢
RETURN RECEIPT SERVICE	SHOW TO WHOM AND DATE DELIVERED	¢
	SHOW TO WHOM, DATE, AND ADDRESS OF DELIVERY	¢
	SHOW TO WHOM AND DATE DELIVERED WITH RESTRICTED DELIVERY	¢
	SHOW TO WHOM, DATE AND ADDRESS OF DELIVERY WITH RESTRICTED DELIVERY	¢
TOTAL POSTAGE AND FEES		$
POSTMARK OR DATE 11/7/84		

PS Form 3800, Apr. 1976

PS Form 3811, Jan. 1978 RETURN RECEIPT, REGISTERED, INSURED AND CERTIFIED MAIL

SENDER: Complete items 1, 2, and 3. Add your address in the "RETURN TO" space on reverse.

1. The following service is requested (check one.)
- XX Show to whom and date delivered............ ¢
- ☐ Show to whom, date and address of delivery... ¢
- ☐ RESTRICTED DELIVERY Show to whom and date delivered............ ¢
- ☐ RESTRICTED DELIVERY. Show to whom, date, and address of delivery. $

(CONSULT POSTMASTER FOR FEES)

2. ARTICLE ADDRESSED TO:

Mr. Harold W. Long, Jr.
P. O. Box 1110
Mulberry, Florida 33860

3. ARTICLE DESCRIPTION:

REGISTERED NO.	CERTIFIED NO.	INSURED NO.
	0155770	

(Always obtain signature of addressee or agent)

I have received the article described above.

SIGNATURE ☐Addressee ☐Authorized agent

[signature]

4. DATE OF DELIVERY 11-9-84 — POSTMARK

5. ADDRESS (Complete only if requested)

6. UNABLE TO DELIVER BECAUSE: — CLERK'S INITIALS [initials]

☆GPO : 1979-300-459

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301-8241

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

October 25, 1984

Mr. H. W. Long, Jr.
Agrico Mining Company
Post Office Box 1110
Mulberry, Florida 33860

Dear Mr. Long:

I am in receipt of your letter to Roger Stewart dated October 12, 1984. In the letter you refer to Agrico Chemical Company's "application to modify the proposed prilled sulfur ship unloading and storage installation at the Big Bend port facility," and you request to be informed as to whether the modification would be exempt from the Department's regulatory authority. You have also requested that the application for modification be treated separate from the renewal proceeding on Permit No. AC 29-5954.

With regard to your last request, the Department will allow you to submit your proposal for modification as a suggested alternative project to the Big Bend project that is currently subject to renewal. The Department will proceed with its review of the newly submitted proposal under the standard procedures of Section 120.60, Florida Statutes. We disagree, however, with your assessment that the new proposal is not subject to Department review because it is not a "modification" as defined by Florida Administrative Code Rule 17-2.100(105). Your proposal seeks to double the annual throughput of sulfur product, which, according to your estimates, would not result in emissions of particulate in excess of the allowable emission rate authorized in the current permit. Rule 17-2.100(105) refers to increases in the actual emissions of air pollutants, not the allowable emissions. In addition, the Department cannot grant separate review status to

your new proposal as an alternative to the existing project without considering the effect of the new project as a whole.

Considering that this is a modification to your existing permit, we are returning your $100 check.

Please contact me if you have any further questions.

Sincerely,

Clair Fancy
Deputy Chief
Bureau of Air Quality
Management

CF/NEW/plb

cc: Roger Stewart
Dan Williams

P 408 530 305

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED—
NOT FOR INTERNATIONAL MAIL

(See Reverse)

Sent to Mr. H. W. Long, Jr.	
Street and No.	
P.O., State and ZIP Code	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to whom and Date Delivered	
Return Receipt Showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	$
Postmark or Date 10/26/84	

PS Form 3800, Feb. 1982

PS Form 3811, Jan. 1979

RETURN RECEIPT, REGISTERED, INSURED AND CERTIFIED MAIL

SENDER: Complete items 1, 2, and 3.
Add your address in the "RETURN TO" space on reverse.

1. The following service is requested (check one.)
   - ☒ Show to whom and date delivered..... ¢
   - ☐ Show to whom, date and address of delivery.... ¢
   - ☐ RESTRICTED DELIVERY
     Show to whom and date delivered..... ¢
   - ☐ RESTRICTED DELIVERY.
     Show to whom, date, and address of delivery.$____

(CONSULT POSTMASTER FOR FEES)

2. ARTICLE ADDRESSED TO:
Mr. H. W. Long, Jr.
P. O. Box 1110
Mulberry, FL 33860

3. ARTICLE DESCRIPTION:

REGISTERED NO.	CERTIFIED NO.	INSURED NO.
	P408530305	

(Always obtain signature of addressee or agent)

I have received the article described above.
SIGNATURE ☐Addressee ☒Authorized agent

Pam Goodwin

4. DATE OF DELIVERY: 10-29-84 — POSTMARK

5. ADDRESS (Complete only if requested)

6. UNABLE TO DELIVER BECAUSE: — CLERK'S INITIALS: DK

☆GPO : 1979-300-459

de la PARTE AND GILBERT, P.A.
ATTORNEYS AT LAW

EDWARD M. CHEW
EDWARD P. de la PARTE, JR.
LOUIS de la PARTE, JR.
CAROLYN M. FIELDS
RICHARD A. GILBERT
LARRY I. GRAMOVOT
WALTER R. HEINRICH

705 EAST KENNEDY BOULEVARD
TAMPA, FLORIDA 33602-5011
(813) 229-2775

August 28, 1984

Southwest District

Ms. Nancy Wright, Esquire
Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32301

PUROLATOR COURIER

Re: Agrico Chemical Company's Request to Renew Air Permit No. AC-29-5954

Dear Nancy:

Please find enclosed an executed Waiver of 90-Day Time Limit Under Sections 120.60(2) and 403.0876, Florida Statutes form for the above-referenced permit proceedings. Without waiving its rights in that proceeding, Agrico has decided to extend the permit review time limit from September 2, 1984 to December 15, 1984. This additional time will allow the Department an opportunity to review an air construction permit modification application, which Agrico Chemical Company intends to file within the next few weeks. This new application will seek modification of the proposed Big Bend prilled sulphur ship unloading and storage installation and the issuance of a new construction permit for the modified facility. This new application will create a new permit proceeding and is not intended as a modification of the above-referenced permit or Agrico's request to renew said permit. Of course, a favorable decision on Agrico's modification application will obviate the need to pursue the renewal of the current permit. If you have any questions, please feel free to call.

Sincerely,

de la PARTE & GILBERT, P.A.

Edward de la Parte

Edward P. de la Parte, Jr.

EPdlP/bac
enclosure
cc w/encl.: Don Morrow

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

SOUTHWEST DISTRICT

7601 HIGHWAY 301 NORTH
TAMPA, FLORIDA 33610

WAIVER OF 90 DAY TIME LIMIT
UNDER SECTIONS 120.60(2) AND 403.0876, FLORIDA STATUTES

License (Permit, ~~Certification~~) Application No. AC 29-5954*

Applicant's Name: Agrico Chemical Company

The undersigned has read Sections 120.60(2) and 403.0876, Florida Statutes, and fully understands the applicant's rights under that section.

With regard to the above reference license (permit, ~~certification~~) application, the applicant hereby with full knowledge and understanding of (~~his~~) (~~her~~) (its) rights under Sections 120.60(2) and 403.0876, Florida Statutes, waives the right under Sections 120.60(2) and 403.0876, Florida Statutes, to have the application approved or denied by the State of Florida Department of Environmental Regulation within the 90 day time period prescribed in Sections 120.60(2) and 403.0876, Florida Statutes. Said waiver is made freely and voluntarily by the applicant, is in (~~his~~) (~~her~~) (its) self-interest, and without any pressure or coercion by anyone employed by the State of Florida Department of Environmental Regulation.

This waiver shall expire on the 15th day of December 19 84.

The undersigned is authorized to make this waiver on behalf of the applicant.

*Re: Extension letter to DER - June 4, 1984

GLORIA N. CSAAY NOTARY PUBLIC STATE OF FLORIDA AT LARGE

Sworn to and subscribed
before me this 28th day
of August, 19 84.

Gloria N. Csaay

Notary Public State of Florida at Large
My Commission Expires Dec. 9, 1987

Don R Morrow
Signature

Don R. Morrow
Please Type Name of Signee

August 28, 1984
Date

Section 120.60, Florida Statutes

(2) When an application for a license is made as required by law, the agency shall conduct the proceedings required with reasonable dispatch and with due regard to the rights and privileges of all affected parties or aggrieved persons. Within 30 days after receipt of an application for a license, the agency shall examine the application, notify the applicant of any apparent errors or omissions, and request any additional information the agency is permitted by law to require. Failure to correct an error or omission or to supply additional information shall not be grounds for denial of the license unless the agency timely notified the applicant within this 30 day period. The agency shall notify the applicant if the activity for which he seeks a license is exempt from the licensing requirement and return any tendered application fee within 30 days after receipt of the original application or within 10 days after receipt of the timely requested additional information or correction of errors or omissions. Every application for license shall be approved or denied within 90 days after receipt of the original application or receipt of the timely requested additional information or correction of errors or omissions unless a shorter period of time for agency action is provided by law. The 90-day or shorter time period shall be tolled by the initiation of a proceeding under Section 120.57 and shall resume 10 days after the recommended order is submitted to the agency and the parties. Any application for a license not approved or denied within the 90-day period or shorter time period, within 15 days after conclusion of a public hearing held on the application, or within 45 days after the recommended order is submitted to the agency and the parties, whichever is latest, shall be deemed approved and, subject to the satisfactory completion of an examination, if required as prerequisite to licensure, the license shall be issued. The Public Service Commission, when issuing a license, and any other agency, if specifically exempted by law, shall be exempt from the time limitations within this subsection. Each agency, upon issuing or denying a license, shall state with particularity the grounds or basis for the issuance or denial of same, except where issuance is a ministerial act. On denial of a license application on which there has been no hearing, the denying agency shall inform the applicant of any right to a hearing pursuant to Section 120.57.

Section 403.0876, Florida Statutes

Permits; processing. ---Within 30 days after receipt of an application for a permit under this chapter, the department shall review the application and shall request submittal of all additional information the department is permitted by law to require. If the applicant believes any departmental request for additional information is not authorized by law or departmental rule, the applicant may request a hearing pursuant to s. 120.57. Within 30 days after receipt of such additional information, the department shall review it and may request only that information needed to clarify such additional information or to answer new questions raised by or directly related to such additional information. If the applicant believes the request of the department for such additional information is not authorized by law or departmental rule, the department, at the aplicant's request, shall proceed to process the permit application. Permits shall be approved or denied within 90 days after receipt of the original application, the last item of timely requested additional material, or the applicant's written request to begin processing the permit application.

de la PARTE AND GILBERT, P. A.
ATTORNEYS AT LAW

EDWARD M. CHEW
EDWARD P. de la PARTE, JR.
LOUIS de la PARTE, JR.
CAROLYN M. FIELDS
RICHARD A. GILBERT
LARRY I. GRAMOVOT
WALTER R. HEINRICH

705 EAST KENNEDY BOULEVARD
TAMPA, FLORIDA 33602-5011
(813) 229-2775

August 17, 1984

Mary F. Smallwood, Esquire
General Counsel
Department of Environemental
Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahasse, Florida 32301

Re: Agrico Chemical Company's Request to Renew Air Permit No. AC 29-5954

Dear Mary:

I am in receipt of a July 6, 1984 letter from Ms. Judith Kavanaugh addressed to you. In this letter Ms. Kavanaugh, writing in behalf of Freeport Sulphur Company and Freeport Land Company, contends that the Department's standards for the renewal of an air construction permit are contained in an untitled General Counsel Opinion, which states that "... a new source should not be allowed to avoid future rule requirements by obtaining a construction permit where there is no present intent to construct the facility." She argues that Agrico's request fails to meet this standard, since the company has no present intent to construct the facility. More specifically, she states Agrico has apparently placed the wastewater construction permit on hold, has not commenced any construction activity, and is

presumably seeking an extension of the air construction permit for the singular purpose of avoiding the retroactive application of any subsequently adopted sulphur standard.

The legal premises and factual conlusions contained in Ms. Kavanaugh's letter are totally incorrect! Furthermore, Ms. Kavanuagh's letter fails to mention several other legal principles which pertain to this situation. I will elaborate on these matters in this letter.

First, Ms. Kavanaugh is correct in stating that Chapter 403, Florida Statutes and Florida Administrative Code Chapter 17 contain no particular standards governing permit renewals. However, she is incorrect in relying on past agency practice to supply these standards. Florida law is quite clear on this point. Absent a specific statute or rule expressly addressing renewal, the standards applicable to the renewal of a permit are found implicitly in the provisions pertaining to revocation of a permit. See City of Tampa v. Islands Four, Inc., 364 So.2d 738, 740 (Fla. 2d DCA 1978), wherein the Second District held as follows:

> As explained in Librizzi v. Plunkett, 126 N.J.L. 17, 16 A. 2d 280 (1940) the power to revoke for certain enumerated reasons has as a corollary the implied power to refuse to renew for those same reasons. This conclusion is based on the perceived legislative intent made to appear from the time limit placed on the duration of the license and the power to revoke for failure to observe the requisites of the ordinance at issue. Absent a specific ordinance or a statute expressly addressing renewal, the power to refuse to renew and the grounds for refusal to renew are found implicitly in the

section pertaining to revocation.

Consequently, the Department may only refuse to renew Agrico's permit for the reasons stated in Section 403.087 (6) Florida Statutes which provides:

> A permit issued pursuant to this section shall not become a vested right in the permittee. The Department may revoke any permit issued by it if it finds that the permitholder:
>
> (a) has submitted false or inaccurate information in his application;
>
> (b) has violated law, department orders, rules, or regulations or permit conditions;
>
> (c) has failed to submit operational reports or other information required by department rule or regulation;
>
> (d) has refused lawful inspection under s 403.091.

and Florida Administrative Code Rule 17-4.10 (2) and (3), which provide:

> (2) Failure to comply with pollution control laws, rules and regulations shall be grounds for suspension or revocation.
>
> (3) A permit issued pursuant to this chapter shall not become a vested property right in the permitee. The Department may revoke any permit issued by it if it finds that the permitholder or his agent:
>
> (a) submitted false or inaccurate information in his application or operational reports.
>
> (b) has violated law, Department orders, rules or regulations,
>
> (c) has failed to submit operational reports or other information required by Department rules and regulation,
>
> (d) has refused lawful inspection under section 403.091 F.S.

Second, Agrico Chemical Company has not committed any act

which would justify the revocation of the existing air construction permit or the denial of its renewal under either Section 403.087 (6) or Rule 17-4.10 (2) and (3). The request for renewal was submitted in the manner and in the form directed by Nancy Wright and Claire Fancy. The information contained in the renewal request is obviously complete and error free, since the Department did not notify Agrico of any errors or ommissions or request any additional information as required pursuant to Sections 120.60 (2), and 403.0876, Florida Statutes. Agrico has complied with all applicable statutes, Department rules, Department orders and permit conditions in connection with the proposed facility. Agrico submitted to the Department within 90 days of permit issuance the information specifically requested in Specific Condition Nos. 13, 17 & 18. A copy of this submittal, bearing an April 21, 1982 stamp by the Southwest District office and showing copies were sent to Martha Hall, Steve Smallwood and Paul Amundsen on May 10, 1982 is attached. Agrico has not refused any lawful inspection of the Big Bend site in contravention of Section 403.091. Finally, the Department has never notified Agrico that it has committed acts for which the permit could be revoked.

Third, if the Department should decide to deny renewal, the procedure which must be followed is that applicable to revocation and not the procedure applicable to the denial of an initial

permit application. This principle was clearly stated by the First District in Dubin v. Department of Business Regulation 262 So.2d 273, 274 (Fla. 1st DCA 1972), wherein the court rejected the agency's attempt to treat the denial of a permit renewal in the same fashion as the denial of an initial permit application.

> Respondent contends that a licensee has a continuing burden to demonstrate that he possesses all of the statutory requisites to licensure each year when his license comes up for renewal.
>
> * * *
>
> Regrettably, the respondent has misconstrued the nature of its duties and obligations as they relate to its license renewing function. The courts of this state have held that refusal to renew a license to a person who has once demonstrated that he possesses statutory prerequisites to licensure cannot be used as a substitute for a license revocation proceeding.

The court went on to state that the agency could only deny the renewal if it followed the procedural safeguards provided by Chapter 120 for license revocations and if it assumed the burden of proving the grounds for denial.

> Before the respondent board may refuse to renew a license, charges must be filed against the licensee setting forth with a reasonable degree of specificity the grounds upon which it bases its action and all other procedural safeguards as provided by Chapter 120, Florida Statutes must be afforded. In such a proceeding, the burden is upon the administrative agency to adduce evidence supportive of the charges preferred.

Id. at 275. See also City of Tampa v. Islands Four, Inc. supra at 741, Footnote 5, wherein the Second District stated, "The rule in Dubbin, Vocelle, and similar cases applicable to the facts

before us, is that there is no less due process protection for refusal to renew than for revocation of a license."

Consequently, in order to refuse Agrico's request to renew the permit, the Department must follow the procedures contained in Section 120.60 (6), Florida Statutes, which provides:

> (6) No revocation, suspension, annulment or withdrawal of any license is lawful unless, prior to the entry of a final order, the agency has served, by personal service or certified mail, an administrative complaint which affords reasonable notice to the licensee of facts or conduct which warrant the intended action and unless the licensee has been given an adequate opportunity to request a proceeding pursuant to s. 120.57. When personal service cannot be made and certified mail notice is returned undelivered, the agency shall cause a short, simple notice to the licensee to be published once a week for four consecutive weeks in a newspaper published in the county of the licensee's last known address as it appears on the records of the board. If no newspaper is published in that county, the notice may be published in a newspaper of general circulation in that county. If the address is in some state other than this state or in a foreign territory or country, the notice may be published in Leon County.

Florida Administrative Code Rule 17-103.130 (2), which provides:

> (2) In enforcement, license revocation, or similar proceedings, the Department shall have the burden of proof. In these proceedings, the order of presentation shall be the Department, any party who supports the action proposed by the Department, any party against whom the proceedings has been initiated and any party who opposes the action proposed by the Department. Rebuttal testimony and public comment shall be submitted as directed by the presiding officer. The parties may agree to any other order of presentation.

Florida Administrative Code rule 17-103.190, which provides:

> The Department may suspend or revoke any Department permits, certification, or certificate as provided by Section 403.087 Florida Statutes and Chapters 17-4 and 17-16 Florida Administrative Code. Prior to suspending or revoking such permit, certification or certificate, the Department shall

> serve by certified mail, an administrative complaint. The procedures contained in Sections 28-6.90 and 28-6.11 Florida Administrative Code, are expresssly incorporated herein and shall govern such suspension or revocation.

and Florida Adminstrative Code Rule 17-410 (1), which states:

> (1) Permits shall be effective until suspended, revoked, surrended or expired and shall be subject to the provisions of Chapter 403, F.S. and the rules and regulations of the Department.
>
> * * *
>
> No revocation shall become effective except after the notice is served upon the person or persons named therein and a hearing held if requested within the time specified in the notice. The notice shall specify the provisions of law, rule or regulation alleged to be violated and/or the permit condition or Department order alleged to be violated and the facts alleged to constitute a violation thereof.

Fourth, the Department's prior policy is found in its Final Orders, not in untitled General Counsel Opinions. Although, I could not find a Final Order dealing specifically with the renewal of an air construction permit, I did find a Final Order involving the modification of an air construction permit, which contains statements of agency policy applicable to this situation. In Izaak Walton League v. Manatee Energy Company, 1 F.A.L.R. 947 (DER July 27, 1979) the Department was confronted with a third-party challenge to the proposed modification of an air construction permit. The Intervenor argued that the permit holder's request for modification reopened the technical validity of the current permit. This proposition was rejected by the hearing officer. The hearing officers's ruling was adopted by

Assistant Secretary Tschinkel, who stated:

> In this case, the hearing officer was correct in considering only the impact of emissions resulting from the modification to the previously permitted facility. Under Sexton Cove Estates, Inc. v. State Pollution Control Board, 325 So.2d 468 (Fla. 1st DCA 1976), a permit applicant has the right to have his application reviewed in accordance with the rules and regulations in existence at the time the application was filed. Moreover, when a permit has actually been issued by the Department, the permit may not be revoked, suspended or modified except as provided in Chapter 17-4, Fla. Admin. Code and Section 403.087 (6), F.S. IT IS NOT WITHIN THE AUTHORITY OF THE DEPARTMENT TO EVAULATE A PERMITTED FACILITY SOLELY BECAUSE THE PERMITTEE HAS SOUGHT A PERMIT TO MODIFY THAT FACILITY. (emphasis added).

Id. at 948 Applying this policy to the instant situation, means that the Department is not authorized to reevaluate the permitted facilities solely because Agrico has requested to renew the permit for an additional two years. Therefore, any changes in technical information that have occurred since the permit was first issued may not be applied to the facility until such time as the facility is constructed and Agrico applies for an Air Operation permit pursuant to Florida Administrative Code Chapters 17-2 and 17-4. According to the Department's own policy the only issue presented by the permit renewal is whether Agrico has presented a sufficient case for an extension of the time period to construct the facility. Obviously, this was accomplished since the Department failed to notify Agrico of any errors or omissions or request any additional information as required puruant to Sections 120.60 (2) and 403.0876, Florida Statutes.

Fifth, Agrico Chemical Company did not voluntarily defer the

construction of the proposed facility until after the completion of the Department's sulphur rulemaking. Agrico was compelled and convinced to take this course of action by the Department. As you recall, on June 30, 1982 Secretary Tschinkel wrote a letter to L. C. Lahman, Plant Manager of Agrico's South Pierce Chemical Works requesting that the company defer permitting of a proposed prilled sulphur installation at that facility. A copy of this letter is attached. Subsequently on July 26, 1982, Department attorney, Martha H. Hall wrote me a letter making the same request with respect to the facility at issue herein. A copy of this letter is attached. Although, Agrico initially refused to defer permitting for the Big Bend facility, it eventually acquiesed. However, despite the expiration of over two years since those initial letters, the Department has been unable to complete its rule inquiry and does not plan to complete it until 1985. As a result of this delay, as well as Freeport Sulphur Company's and Freeport Land Company's opposition to the project, Agrico was forced to request an extension of the permit. Contrary to Ms. Kavanaugh's representations, Agrico continues to have a very real and concrete intent to build a prilled sulphur terminal at Big Bend.

Sixth, Agrico is not seeking the renewal of the permit for the singular purpose of avoiding the retroactive application of any subsequently adopted sulphur standard. The only reasons for

permit renewal are those stated in Mr. Long's June 4, 1984 letter to Mr. Claire Fancy and in the immediately preceding paragraph of this letter. As you well know, the existing permit already contains a specific condition on the issue of retroactivity, which states:

> Permittee shall comply with any applicable 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.

AC 29-5954, Specific Condition No. 20. Agrico has not requested the modification of any permit condition, including that provision.

In conclusion, it is amazing to me that Freeport Sulphur Company and Freeport Land Company are able to argue that the permit renewal should be denied inasmuch as Agrico has placed the project on hold pending the outcome of the sulphur rule inquiry. As you know, the Department's request to Agrico to defer construction of the proposed facility was based in no small part on Freeport Land Company's and Freeport Sulphur Company's demands. In fact, in a May 3, 1983 letter referring to the wastewater permit application for Big Bend, their counsel wrote:

> This letter is written on behalf of and at the direction of our clients, Freeport Sulphur Company, Sulphur Terminals, Inc. and Freeport Land Company. The position of our clients is that the issuance of any solid sulphur permits during the pendancy of the sulphur rulemaking would prejudice full and fair rulemaking and could result in a situation which would allow circumvention of the Department's ultimate rulemaking decision.

A copy of this letter is attached. Now, they want to punish Agrico for voluntarily complying with their own request. This type of action can only serve to generate unnecessary litigation and impede the Department's resolution of this matter. This action also calls to question their willingness to abide with the Department's rulemaking decision, since they are apparently determined to challenge all permits regardless of the consequences.

I hope my remarks have put the matters raised in Ms. Kavanaugh's letter in perspective. If you have any questions, please don't hesitate to call.

Sincerely,

de la PARTE & GILBERT, P.A.

Edward P. de la Parte, Jr.

EPdlP/bac
enclosures
cc w/enclosures: Nancy Wright
Steve Smallwood
Claire Fancy
Dan Williams
Don Morrow
Ed Huck

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301-8241

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

June 30, 1982

L. C. Lahman, Plant Manager
Agrico Chemical Company
Post Office Box 1969, S.P.C.W.
Bartow, FL 33830

Dear Mr. Lahman:

On May 10, 1982, Agrico filed an application with this Department for a permit to construct a sulfur terminal in Polk County, Florida. As I am sure you are aware, the Department has until recently been involved in lengthy litigation involving a disputed permit similar to the one sought by your company. The litigation resulted in the issuance of the permit. However, much of the controversy regarding prilled sulfur handling and the relative effectiveness of available control measures remains unresolved. The Department has already received two requests from third parties for notice of intended agency action on your permit application. Should the Department grant your permit application, it is likely that a third party intervenor will request a hearing -- thus involving both your company and the Department in time consuming litigation.

The Department is currently engaged in a formal inquiry regarding sulfur handling in Florida and anticipates that rules specifically dealing with sulfur handling may emerge. The tentative schedule for the sulfur inquiry is as follows. (1) A questionaire will be sent out to all interested and affected parties in early July. The questionaire will solicit information regarding both liquid and solid sulfur and the risks and benefits associated with both. Responses will be requested within six weeks of the date the questionaire is mailed. (2) The responses to the questionaire will be analyzed by the Department's technical staff. On the basis of the solicited information and any other data, the Department will make an initial determination of whether additional rules are needed relating to sulfur handling. This determination will be reflected in a document prepared for presentation by the staff to me. (3) A workshop will be held in the fall of 1982 to solicit public comment on the staff's

"EXHIBIT H"

findings. Based upon the comments made at the workshop, additional workshops may be held. (4) If the Department determines that no rule is necessary, the inquiry will cease. (5) If the Department concludes that a rule should be developed, rulemaking will begin. I would estimate that it would take four to six months to develop a rule and present it to the Environmental Regulation Commission.

While it currently is unclear whether additional rules are necessary and, if so, what control measures they should reflect, it is the Department's present intent that any rule adopted will apply to both existing and new sulfur handling facilities. Existing facilities which do not comply with such rules will be required to retrofit or possibly even shut down.

Clearly, it is in your best interests to become actively involved in the Department's sulfur inquiry and any rulemaking which may result. I also suggest that, due to the uncertainty about the content of any rules developed, it would be worth your while to withdraw your permit application and refile after a rule has been adopted or the Department has determined that no rule is necessary. In the alternative, you could waive the ninety day permitting clock, thus allowing the Department to delay issuing a permit to you until you know what standards will be made applicable to you under a new rule.

If you elect to neither withdraw your application nor waive the ninety day permitting clock, the Department will exercise its authority under Florida Administrative Code Rule 17-4.08(1)(e) to conform your permit with subsequently adopted rules. Rule 17-4.08(1)(e) allows the Department to:

> require the permittee from time to time, for good cause, to conform to new or additional conditions . . . . [G]ood cause shall include but not be limited to, the following: . . . (e) Adoption or revision of Florida Statutes, rules, regulations and standards which require the modification of a permit condition for compliance.

I would appreciate your prompt response to this letter, indicating your recognition that any rule which results from the sulfur inquiry will apply to you. Again, I encourage you to withdraw your pending application or waive the ninety day permitting clock. If you have any questions, please feel free to call me at (904)488-4805 or Martha Harrell Hall at (904)488-9471.

Sincerely,

Victoria J. Tschinkel
Secretary

VJT:jy

PEEPLES, EARL, REYNOLDS & BLANK
PROFESSIONAL ASSOCIATION
ATTORNEYS AT LAW

L. BRANT PEEPLES
WILLIAM L. EARL
ROBERT M. REYNOLDS, P.A.
ROBERT M. BLANK
PAUL H. ARMBRUSTER
WILLIAM F. TARR
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ONE BISCAYNE TOWER, SUITE 3630
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(305) 358-3000

306 EAST COLLEGE AVENUE
POST OFFICE BOX 1169
TALLAHASSEE, FLORIDA 32302
(904) 222-2156

REPLY TO

Miami

May 9, 1983

Mr. Steve Smallwood
Bureau Chief
Air Quality Management
Department of Environmental Regulation
2600 Blair Stone Road
Twin Towers Office Building
Tallahassee, Florida 32302

Re: Sulphur Rulemaking/Permit Application No. AC24-61435 (Occidental)/Permit Application No. IC29-55453 (Agrico)/Permit Application No. AC53-55780 (Agrico)/ Permit Application No. AC53-54988 (Detsco)

Dear Steve:

This letter is written on behalf of and at the direction of our clients, Freeport Sulphur Company, Sulphur Terminals, Inc., and Freeport Land Company. The position of our clients is that the issuance of any solid sulphur permits during the pendency of the sulphur rulemaking would prejudice full and fair rulemaking and could result in a situation which would allow circumvention of the Department's ultimate rulemaking decision.

I am enclosing technical data on the silt content of solid sulphur and an analysis relating to technical conclusions in permit application No. AC24-61435. This information is submitted in response to the Department's prior request to Freeport. Application No. AC24-61435 is important not only because it endangers the integrity of the rulemaking, but because it is an example of significant technical errors in pending solid sulphur permit applications. This application indicates that a .4% silt content is to be expected from vatted sulphur and that the .4% figure should be utilized in computing expected emissions and for determining whether the PSD threshold will be exceeded. As pointed out in the enclosed TRC technical memorandum, the .4%

"EXHIBIT C"

silt figure is grossly understated. This .4% silt figure is apparently based on an erroneous testing methodology in which the sieves were apparently overloaded and dry seiving instead of wet seiving was utilized. The enclosed technical report on the percent of silt to be expected from vatted sulphur clearly indicates that a three to four percent silt content is conservative. This is significant because if a conservative silt percentage of three to four percent is utilized, the PSD threshold is exceeded.

This is to request that this letter and the enclosed technical information be put in each of the above-referenced solid sulphur permit application files, including application No. AC24-51435. To avoid making each of the pending solid sulphur permit application files unnecessarily voluminous, I am hereby requesting that the Department incorporate by reference all of the technical materials contained in the sulphur rulemaking into each of the above-referenced solid sulphur permit applications. Please advise me if the Department cannot do this, in which case I will submit duplicate copies of the materials for each permit application.

In conclusion, my clients request that full and fair rulemaking be completed as expeditiously as possible, and that all individual solid sulphur permits be denied until rulemaking is completed. Please let me know if you desire additional information or if you have any questions regarding the enclosed technical materials.

Very truly yours,

PEEPLES, EARL, REYNOLDS & BLANK, P.A.

William L. Earl
For the Firm

WLE/re
Enclosure
cc: Mary Smallwood, Esquire
Jacksonville Subdistrict Office

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

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

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

July 26, 1982

Edward P. de la Parte, Jr.
de la Parte & Gilbert, P.A.
705 East Kennedy Blvd.
Tampa, Florida 33602

RE: Agrico's Pending Application for an Industrial Wastewater Permit at Tampa Big Bend.

Dear Ed:

As you probably know, Secretary Tschinkel recently wrote to the Plant Manager of Agrico's South Pierce facility to suggest that the sulfur application for that facility either be withdrawn or the ninety (90) day permitting time waived. I am attaching that letter for your consideration.

Sinse the sulfur investigation now being conducted by Steve Smallwood could result in rule changes applicable to Agrico's pending industrial wastewater permit, the suggestions offered by the Secretary in relation to the South Pierce may also be applicable to the water permit for Agrico Big Bend.

If you have any questions regarding this matter, please give me a call.

Sincerely,

Martha Harrell Hall

Martha Harrell Hall
Assistant General Counsel

MHH/ab
Enc.

Agrico
ONE OF THE WILLIAMS COMPANIES

April 19, 1982

Mr. Dan Williams
State of Florida
Department of Environmental Regulation
7601 Highway 301 North
Tampa, FL 33610

Dear Dan:

Enclosed are the plans for compliance with listed conditions of D.E.R. permit #AC-29-5954 for Agrico's Big Bend Sulfur Terminal. This permit requires submittal of these plans within 90 days of the permit issuance date of 2/5/82 therefore we believe this enclosure satisfies that requirement.

If you have any questions regarding this matter please contact me.

Very truly yours,

H W Long Jr

H. W. Long, Jr.
Manager
Environmental Control

HWL,jr./jm
Enclosure

cc: Mr. E. P. de la Parte, Jr., Attorney-at-law
Mr. R. W. Curtis - Tulsa

D.E.R.
APR 21 1982
SOUTHWEST DISTRICT
TAMPA

copies sent to
Marti Hall
Steve Smallwood
Paul Amundsen
5-10-82
DW

The following sampling and analytical methods will be used to comply with the listed conditions of permit #AC 29-5954 for Agrico's sulfur terminal.

Condition #13

Visible emissions readings will be made by a certified observer as required. Application of water to the sulfur pile will be withheld so that minimum suitable moisture conditions will exist during this period. Also during this period a series of 500 gram grab samples of prilled sulfur will be obtained at various surface points of the storage pile at intervals of 1/4 of the pile from top to bottom. These samples will be analyzed separately for moisture content by the following method.

> Weigh 500 grams of the sample in a shallow covered container and spread out so that the depth is not over two inches. Place container with cover removed in a hot air oven at 105°C. Dry five hours, or to constant weight. If oven is not mechanical convection type dry ten hours or to constant weight. Remove sample from oven, cover, cool to room temperature and re-weigh immediately. This procedure is used to calculate the percent moisture of the sulfur.
>
> $$\% \text{ Moisture} = \frac{\text{Loss in Wt. x 100}}{\text{Wt. of Sample}}$$

Condition #17

A 500 gram grab sample will be taken at four surface points of the storage pile at intervals of 1/4 of the pile from top to bottom. These samples will be composited and analyzed for moisture content using the same method as listed in Condition #13.

Condition #18

Ambient air monitoring for particulate matter will be implemented by using High Volume samplers. These instruments will be permanently located so that samples are collected to represent upwind and downwind conditions, whenever possible. Filter papers will be used in these samplers for collection of particulate matter. These papers will be dried and weighed prior to use. After use, the filters will again be dried and weighed to determine the amount of particulate matter collected. Background data will be obtained for comparison of conditions before and after sulfur is received at this location.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET
ATLANTA, GEORGIA 30365

APR 8 1983

REF: 4AW-AM

DER
APR 15 1983
BAQM

Mr. Thomas P. Corr
General Partner
Frandorson Management Corporation
Suite 200, One Frandorson Circle
Apollo Beach, Florida 33570

Dear Mr. Corr:

This is in reference to your letter of February 18, 1983, to Mr. Norman W. Hickey, County Administrator for the County of Hillsborough, Florida, concerning Agrico Chemical Company's efforts to begin importing prilled sulfur at their Big Bend Terminal just north of Apollo Beach.

At the present time, the State of Florida Department of Environmental Regulation (DER) has primary responsibility for conducting the initial review of any source applying for an air permit. When an application for an air permit is submitted to the State of Florida DER, the Florida DER will review the application and determine if the source is subject to the Prevention of Significant Deterioration (PSD), New Source Performance Standards (NSPS), or National Emission Standards for Hazardous Air Pollutants (NESHAPS) regulations. If the source is subject to PSD requirements, the Florida DER will review the permit application, prepare the preliminary determination and the draft construction permit. EPA reviews the preliminary determinations as well as the draft permit prepared by Florida DER to insure that the applicable PSD requirements are met to prevent violation of the National Ambient Air Quality Standards. The preliminary determination and draft permit are subject to public comment. After the public comment period the State prepares the final determination and construction permit, and forwards them to EPA. EPA reviews and issues a PSD permit with the conditions contained in the final determination and construction permit thereby granting a company authority to construct the source.

For those sources subject to NSPS and NESHAPS regulations, EPA has delegated authority to the Florida DER to issue construction permits. EPA is in the process of approving the Florida DER PSD regulations which will enable the State to issue PSD permits instead of EPA.

The Florida DER has determined that the source referenced in your letter, Agrico Chemical Company, is not subject to PSD, NSPS, or NESHAPS regulations. It has also been determined by the Florida DER that the operations at the Big Bend Terminal emit less than twenty-two tons per year of particulate matter under controlled conditions. The Florida DER issued a permit to Agrico in February 1982 which addresses the construction of storage facilities at the Big Bend Terminal for the storage of prilled sulfur. However, according to the Florida DER, Agrico has not yet initiated the construction nor obtained the permit to unload the prilled sulfur at this facility.

Also, any storage area and unloading operations would have to be designed to avoid adverse effects on water quality. This could be done either by preventing runoff or, if there were to be a discharge, a National Pollutant Discharge Elimination System (NPDES) permit with necessary limitations would be required.

Once a source is constructed, EPA shares a joint responsibility with the Florida DER to assure the source is in compliance with all applicable pollution abatement regulations. These regulations are established to achieve and maintain specific ambient air and water quality standards designed to protect the public health and welfare. Although EPA shares this responsibility with the Florida DER, the Florida DER is the primary agency responsible for assuring that these regulations are met.

If you have any further questions regarding this matter, please contact Mr. Richard S. DuBose, Chief, Air Engineering Section, Air Management Branch, Air and Waste Management Division, at 404/881-7654.

Sincerely yours,

Charles R. Jeter
Regional Administrator

cc: Mr. Steve Smallwood, Chief
Bureau of Air Quality Management
Florida Department of
Environmental Regulation

Mr. Norman W. Hickey
Hillsborough County Administrator

PEEPLES, EARL, MOORE & BLANK
PROFESSIONAL ASSOCIATION
ATTORNEYS AT LAW

L. GRANT PEEPLES
WILLIAM L. EARL
EDGAR M. MOORE
ROBERT H. BLANK
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PAUL H. AMUNDSEN
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COUNSEL

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TWO SOUTH BISCAYNE BOULEVARD
MIAMI, FLORIDA 33131
(305) 358-3000

300 EAST PARK AVENUE
POST OFFICE BOX 1169
TALLAHASSEE, FLORIDA 32302
(904) 222-5510

REPLY TO:
Miami

July 15, 1982

Ms. Victoria J. Tschinkel
Secretary
Department of Environmental
Regulation
2600 Blair Stone Road
Twin Towers Office Bldg.
Tallahassee, Florida 32301

Re: Newspaper Articles Relating to the Sulphur Matter

Dear Vicki:

You indicated some time ago that you would be interested in articles relating to sulphur. I am enclosing several of the more recent articles.

In addition, we have a file filled with sulphur articles for the last four or five years. These relate to earlier attempts to import solid sulphur into Florida and problems existing in Vancouver from the shipment of sulphur from Canada. There are additional articles which deal with the commercial problems resulting from adding water to sulphur. If appropriate, I will make this file of articles available to Steve Smallwood as part of the rulemaking.

Very truly yours,

PEEPLES, EARL, MOORE &
BLANK, P. A.

William L. Earl
For the Firm

WLE/re
Enclosures

cc: Mr. Steve Smallwood (w/encl.) ✓
Mr. Bill Hennessey (w/encl.)
Mr. Doug Outtin (w/encl.)

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

BOB GRAHAM
GOVERNOR

Victoria J. Tschinkel
SECRETARY

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

February 5, 1982

Mr. Harold Long, Jr.
Agrico Chemical Company
Post Office Box 1110
Mulberry, Florida 33860

Dear Mr. Long:

Enclosed is Permit Number AC 29-5954, dated February 5, 1982 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,

C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality Management

cc: Dan Williams, FDER Southwest District
Hooshang Boostani, Hillsborough County Environmental Protection Commission

DER Form 17-1.122(65)

STATE OF FLORIDA
DEPARTMENT OF
ENVIRONMENTAL REGULATION

CONSTRUCTION
PERMIT

NO. AC 29-5954

AGRICO CHEMICAL COMPANY
PRILLED SULFUR TERMINAL

DATE OF ISSUANCE

Feb. 5, 1982

DATE OF EXPIRATION

MARCH 30, 1985

VICTORIA TSCHINKEL
SECRETARY

DER FORM PERM 11-42

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

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

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

APPLICANT: Agrico Chemical Company
P. O. Box 1110
Mulberry, Florida 33860

PERMIT/CERTIFICATION
NO. AC 29-5954

COUNTY: Hillsborough

PROJECT: Prilled Sulfur Terminal

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:

Construction of a prilled sulfur terminal to unload ships, to transfer to storage and to transfer from storage to trucks.

Attachment:

Application to Operate/Construct Air Pollution Sources, DER Form PERM 12-1.

PERMIT NO.: AC 29-5954
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 penalities 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 aporoval 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 29-5954
APPLICANT: Agrico Chemical Company

SPECIFIC CONDITIONS:

1. Construction of this installation shall be completed by September 30, 1984. An application for Permit to Operate shall be submitted no later than 90 days following completion of construction or December 30, 1984, whichever occurs first.
2. This construction permit expires on March 30, 1985 following an initial period of operation for appropriate testing to determine compliance with the Rules of the Florida Department of Environmental Regulation.
3. All applicable rules of the Department including design limitations specified in the application shall be adhered to. The permit holder may also need to comply with county, municipal, federal, or other state regulations prior to construction.
4. The applicant shall continue the retention of the engineer of record for the inspection of the construction of this project. Upon completion the engineer shall inspect for conformity to construction permit applications and associated documents. A report of such inspection shall be submitted by the engineer to the Department of Environmental Regulation for consideration while reviewing the application for an operation permit.
5. The operation of this installation shall be observed for visible emissions in accordance with DER Method 9 - Visible Determination of the Opacity of Emissions from Stationary Sources, 17-2.700(6)(a)9, FAC. The observation results are required prior to issuance of an operation permit, and shall be submitted in duplicate to the Department of Environmental Regulation District Office, 7601 Highway 301 North, Tampa, Florida 33610. The visible emission test shall be conducted for one hour.
6. Issuance of this permit does not indicate an endorsement or approval of any other required permits by this Department.
7. Copies of test results as required by proviso 5 shall be sent by applicant to local program, Hillsborough County Environmental Protection Commission, 1900 Ninth Avenue, Tampa, Florida 33605.
8. The maximum product input to the storage system shall be 300,000 long tons per year of prilled sulfur with minimum 2% moisture.

SPECIFIC CONDITIONS:

9. Maximum operation for the ship unloading system shall be 768 hrs./yr. and for the truck loading system, 8736 hr./yr.
10. A gantry unloading system with a covered, tight-lip bucket and with a moveable apron to cover the opening between the dock and discharge hopper shall be used during ship unloading operations. The maximum free fall height from the bottom of the bucket to the top of the hopper shall be limited to minimize fugitive emissions.
11. A water spray nozzle system shall be employed at each free fall unloading transfer point and shall be in operation during transfer operations as required to control particulate emission. All inclined conveyors shall be covered with a hinged cover. A curbed, paved base shall be used for the containment of water and product from the spray system.
12. The tripper system shall have a telescoping discharge spout and the maximum free fall height shall be ten feet when loading the storage pile.
13. The pile shall be stored on a curbed paved base to contain product and water runoff. The storage pile shall be wetted by 28 "Rain Bird" sprinklers which shall provide full coverage of the storage area in order to provide moisture necessary to prevent dusting resulting in visible emissions. During compliance testing of the facility, the minimum moisture content of the product that prevents dusting resulting in visible emissions shall be determined and shall be made a condition of the operating permit. A plan of study for determining minimum moisture in the pile, including sampling and analytical methods, shall be submitted to FDER for approval within 90 days from the issuance date of the permit.
14. A good housekeeping program to minimize the generation of fines by pay loader traffic shall be proposed to the Department and upon approval shall be made a condition of the operating permit.
15. Transfer of the wet prilled sulfur from the storage pile to truck shall be accomplished by a

covered conveying system feeding an enclosed gravity discharge hopper which shall feed into a loading hatch of an enclosed hopper truck. Trucks with rolling tarpaulin covers shall not be used.

16. Visible emissions emitted from the transfer points and storage pile shall not exceed 5% opacity.
17. The moisture content of the prilled sulfur in the storage pile shall be tested daily from representative samples taken from at least four different points of the storage pile. A sampling program and analytical method shall be submitted to FDER for approval within 90 days from the issuance date of the permit. Results shall be available for inspection by the Department and shall be kept on file for a period of one year.
18. An ambient particulate air monitoring program shall be submitted to FDER for approval within 90 days from the issuance date of the permit and shall be made a condition of the operating permit.
19. Total particulate emissions shall not exceed 5.0 lbs./hr.
20. Permittee shall comply with any applicable 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.

Expiration Date: March 30, 1985

_____ Pages Attached.

Issued this ____ day of _____, 19____.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

_____
Signature

Subject

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

INTEROFFICE MEMORANDUM

For Routing To District Offices And/Or To Other Than The Addressee

To: _____ Loctn.: _____
To: _____ Loctn.: _____
To: _____ Loctn.: _____
From: _____ Date: _____

Reply Optional [ ] Reply Required [ ] Info. Only [ ]
Date Due: _____ Date Due: _____

TO: Dan Williams

THRU: Clair Fancy CCF

FROM: John Svec JPS

DATE: June 29, 1982

SUBJECT: Adequacy of Agrico's Response to Specific Condition in Agrico Chemical Company Permit Number AC 29-5954

The sampling and monitoring plans that were required in Agrico's construction permit have been reviewed by CAPS. The plans were evaluated against the intent for including the requirement as a specific condition. The following are our comments and suggestions:

1) For condition #13, the intent was to determine the minimum moisture content of the prilled sulfur that would prevent visible emissions. A principal cause of emissions from the storage pile is wind. There was no mention of measuring wind velocity and relating the velocity to the generation of emissions. Also, if during the test visible emissions occur, a grab sample from that part of the storage pile should be obtained. The plan mentions nothing about emissions generated during loading the storage pile or unloading the storage pile. During the issuing of the construction permit, the sampling of the interior of the storage pile for moisture content was mentioned. This was not addressed in this plan.

2) Condition #17 is related to the plan for condition #13. The sampling of the interior of the storage pile or the material before unloading the ship was not mentioned in the plan.

3) For condition #18, a map proposing the monitors locations should be provided. Also more detail should be submitted so that the Department could determine if the sites comply with the Department's monitoring site certification requirements. It appears that the sites will monitor total particulate emissions, not just sulfur emissions. No plan is provided detailing how just the impact of the sulfur terminal's operation will be calculated.

I trust these comments will help in determining the adequacy of the plans submitted. If there are any questions regarding this matter, please contact John Svec.

JS:ras

cc: M. Mott-Smith
M. Hall

DEPARTMENT OF ENVIRONMENTAL REGULATION

ROUTING AND TRANSMITTAL SLIP

ACTION NO # 63

ACTION OUT DATE 6-4-82

KAHEL		FANCY		STARNES	
BLOMMEL		THOMAS		MARTY HALL	
BARKER		GEORGE		MARSHALL MOTT-SMITH	
J. ROGERS		PALAGYI			

REMARKS

Succ

Talk with Dan Willm

Please review

draft memo

to Dan Williams

giving our

assessment of

the adequacy of what

Agrico has provided

INFORMATION
- REVIEW & RETURN
- REVIEW & FILE
- INITIAL & FORWARD

DISPOSITION
- REVIEW & RESPOND
- [X] PREPARE RESPONSE
- [X] FOR MY SIGNATURE
- FOR YOUR SIGNATURE
- LET'S DISCUSS
- SET UP MEETING
- INVESTIGATE & REPT
- INITIAL & FORWARD
- DISTRIBUTE
- CONCURRENCE
- FOR PROCESSING
- INITIAL & RETURN

FROM:

STEVE SMALLWOOD

DATE

PHONE

DEPARTMENT OF ENVIRONMENTAL REGULATION

ROUTING AND TRANSMITTAL SLIP

ACTION NO.

ACTION DUE DATE

	INITIAL	DATE
1. TO: (NAME, OFFICE, LOCATION) Steve Smallwood		
2. Bureau of Air Quality Management		
3.		
4. RE: Agrico Chemical Co.		

REMARKS:

Attached is the Agrico submittal in response to condition in permit AC29-5954

Copies are being sent to Martha Hall and Paul Amundsen.

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 & REPT
	INITIAL & FORWARD
	DISTRIBUTE
	CONCURRENCE
	FOR PROCESSING
	INITIAL & RETURN

FROM: Don A. Williamson

DATE 5-10-82

PHONE

Agrico
ONE OF THE WILLIAMS COMPANIES

April 19, 1982

DER
MAY 12 1982
BAQM

Mr. Dan Williams
State of Florida
Department of Environmental Regulation
7601 Highway 301 North
Tampa, FL 33610

Dear Dan:

Enclosed are the plans for compliance with listed conditions of D.E.R. permit #AC-29-5954 for Agrico's Big Bend Sulfur Terminal. This permit requires submittal of these plans within 90 days of the permit issuance date of 2/5/82 therefore we believe this enclosure satisfies that requirement.

If you have any questions regarding this matter please contact me.

Very truly yours,

H. W. Long, Jr.
Manager
Environmental Control

HWL,jr./jm
Enclosure

cc: Mr. E. P. de la Parte, Jr., Attorney-at-law
Mr. R. W. Curtis - Tulsa

D.E.R.
APR 23 1982
SOUTHWEST DISTRICT
TAMPA

The following sampling and analytical methods will be used to comply with the listed conditions of permit #AC 29-5954 for Agrico's sulfur terminal.

Condition #13

Visible emissions readings will be made by a certified observer as required. Application of water to the sulfur pile will be withheld so that minimum suitable moisture conditions will exist during this period. Also during this period a series of 500 gram grab samples of prilled sulfur will be obtained at various surface points of the storage pile at intervals of 1/4 of the pile from top to bottom. These samples will be analyzed separately for moisture content by the following method.

> Weigh 500 grams of the sample in a shallow covered container and spread out so that the depth is not over two inches. Place container with cover removed in a hot air oven at 105°C. Dry five hours, or to constant weight. If oven is not mechanical convection type dry ten hours or to constant weight. Remove sample from oven, cover, cool to room temperature and re-weigh immediately. This procedure is used to calculate the percent moisture of the sulfur.

$$\% \text{ Moisture} = \frac{\text{Loss in Wt. x 100}}{\text{Wt. of Sample}}$$

Condition #17

A 500 gram grab sample will be taken at four surface points of the storage pile at intervals of 1/4 of the pile from top to bottom. These samples will be composited and analyzed for moisture content using the same method as listed in Condition #13.

Condition #18

Ambient air monitoring for particulate matter will be implemented by using High Volume samplers. These instruments will be permanently located so that samples are collected to represent upwind and downwind conditions, whenever possible. Filter papers will be used in these samplers for collection of particulate matter. These papers will be dried and weighed prior to use. After use, the filters will again be dried and weighed to determine the amount of particulate matter collected. Background data will be obtained for comparison of conditions before and after sulfur is received at this location.

PEEPLES, EARL, MOORE & BLANK
PROFESSIONAL ASSOCIATION
ATTORNEYS AT LAW

L. GRANT PEEPLES
WILLIAM L. EARL
EDGAR M. MOORE
ROBERT H. BLANK
L. LEE WILLIAMS, JR.
PAUL H. AMUNDSEN
ROBERT C. APGAR
WILLIAM F. TARR
HOWARD A. SPIER

WALTER T. MOORE, JR.
COUNSEL

ONE BISCAYNE TOWER, SUITE 3636
TWO SOUTH BISCAYNE BOULEVARD
MIAMI, FLORIDA 33131
(305) 358-3000

300 EAST PARK AVENUE
POST OFFICE BOX 1169
TALLAHASSEE, FLORIDA 32302
(904) 222-5510

REPLY TO:

MIAMI

May 3, 1982

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

Re: Agrico Solid Sulphur Permit Conditions
Permit Number AC 29-5954

Dear Marty:

As you know, there are several specific conditions in the above permit which require Agrico to submit reports to DER within ninety days of the date of issuance. Since the permit was issued on February 5, 1982, it appears that these materials must be submitted by Agrico on or before May 6, 1982. Specifically, Agrico is required to submit to DER:

(1) A plan of study for determining moisture content (Proviso No. 13);

(2) A moisture sampling program and analytical method (Proviso No. 17);

(3) An ambient air monitoring program (Proviso No. 18).

This letter is to request copies of these submittals by Agrico. If Agrico has not timely complied with these permit conditions, I would appreciate your so advising me by letter.

Thank you for your assistance.

Sincerely,

PEEPLES, EARL, MOORE & BLANK, P.A.

Paul H. Amundsen
For the Firm

PHA:lp

cc: Judith S. Kavanaugh, Esquire
Roger D. Schwenke, Esquire
Kenneth G. Oertel, Esquire
Thomas W. Reese, Esquire
Peter Belmont, Esquire
Damon C. Glisson, Esquire

1-22-82

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

CONSTRUCTION Permit Provisos

Air Pollution Sources

Permittee: Agrico Chemical Company

Permit No.: AC 29-5954

1. Construction of this installation shall be completed by September 30, 1984. An application for Permit to Operate shall be submitted no later than 90 days following completion of construction or December 30, 1984, whichever occurs first.
2. This construction permit expires on March 30, 1985 following an initial period of operation for appropriate testing to determine compliance with the Rules of the Florida Department of Environmental Regulation.
3. All applicable rules of the Department including design limitations specified in the application shall be adhered to. The permit holder may also need to comply with county, municipal, federal, or other state regulations prior to construction.
4. The applicant shall continue the retention of the engineer of record for the inspection of the construction of this project. Upon completion the engineer shall inspect for conformity to construction permit applications and associated documents.

A report of such inspection shall be submitted by the engineer to the Department of Environmental Regulation for consideration while reviewing the application for an operation permit.

5. The operation of this installation shall be observed for visible emissions in accordance with DER Method 9 - Visible Determination of the Opacity of Emissions from Stationary Sources, 17-2.700(6)(a)9, FAC. The observation results are required prior to issuance of an operation permit, and shall be submitted in duplicate to the Department of Environmental Regulation District Office, 7601 Highway 301 North, Tampa, Florida 33610. The visible emission test shall be conducted for one hour.
6. Issuance of this permit does not indicate an endorsement or approval of any other required permits by this Department.
7. Copies of test results as required by proviso 5 shall be sent by applicant to local program, Hillsborough County Environmental Protection Commission, 1900 Ninth Avenue, Tampa, Florida 33605.
8. The maximum product input to the storage system shall be 300,000 long tons per year of prilled sulfur with minimum 2% moisture.

9. Maximum operation for the ship unloading system shall be 768 hrs./yr. and for the truck loading system, 8736 hr./yr.

10. A gantry unloading system with a covered, tight-lip bucket and with a moveable apron to cover the opening between the dock and discharge hopper shall be used during ship unloading operations. The maximum free fall height from the bottom of the bucket to the top of the hopper shall be limited to minimize fugitive emissions.

11. A water spray nozzle system shall be employed at each free fall unloading transfer point and shall be in operation during transfer operations as required to control particulate emission. All inclined conveyors shall be covered with a hinged cover. A curbed, paved base shall be used for the containment of water and product from the spray system.

12. The tripper system shall have a telescoping discharge spout and the maximum free fall height shall be ten feet when loading the storage pile.

13. The pile shall be stored on a curbed paved base to contain product and water runoff. The storage pile shall be wetted by 28 "Rain Bird" sprinklers which shall provide full coverage of the storage area in order to provide moisture necessary to prevent dusting resulting in visible emissions. During

compliance testing of the facility, the minimum moisture content of the product that prevents dusting resulting in visible emissions shall be determined and shall be made a condition of the operating permit. A plan of study for determining minimum moisture in the pile, including sampling and analytical methods, shall be submitted to FDER for approval within 90 days from the issuance date of the permit.

14. A good housekeeping program to minimize the generation of fines by pay loader traffic shall be proposed to the Department and upon approval shall be made a condition of the operating permit.
15. Transfer of the wet prilled sulfur from the storage pile to truck shall be accomplished by a covered conveying system feeding an enclosed gravity discharge hopper which shall feed into a loading hatch of an enclosed hopper truck. Trucks with rolling tarpaulin covers shall not be used.
16. Visible emissions emitted from the transfer points and storage pile shall not exceed 5% opacity.
17. The moisture content of the prilled sulfur in the storage pile shall be tested daily from representative samples taken from at least four different points of the storage pile. A sampling program

and analytical method shall be submitted to FDER for approval within 90 days from the issuance date of the permit. Results shall be available for inspection by the Department and shall be kept on file for a period of one year.

18. An ambient particulate air monitoring program shall be submitted to FDER for approval within 90 days from the issuance date of the permit and shall be made a condition of the operating permit.
19. Total particulate emissions shall not exceed 5.0 lbs./hr.
20. Permittee shall comply with any applicable 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.

1/22/82

Memo to 1/22/82 P.M.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

CONSTRUCTION PERMIT PROVISOS

AIR POLLUTION SOURCES

(extend program submittals to 90 days)

Permittee: Agrico Chemical Company

Permit No.: AC 29-5954

1. Construction of this installation shall be completed by September 30, 1984. An application for Permit to Operate shall be submitted no later than 60 days following completion of construction or November 30, Dec 30 1984 whichever occurs first.

2. This construction permit expires on February 28, Mar 30 1985 following an initial period of operation for appropriate testing to determine compliance with the Rules of the Florida Department of Environmental Regulation.

3. All applicable rules of the Department including design limitations specified in the application shall be adhered to. The permit holder may also need to comply with county, municipal, federal, or other state regulations prior to construction.

4. The applicant shall continue the retention of the engineer of record for the inspection of the construction of this project. Upon completion the engineer shall inspect for conformity to construction permit applications and associated documents. A report of such inspection shall be submitted by the engineer to the Department of Environmental Regulation for consideration toward the issuance of an operation permit. while reviewing the application for

5. The operation of this installation shall be observed for visible emissions in accordance with Method 9- Visible Determination of the Opacity of Emissions from Stationary Sources, ~~Section 60~~, 40 CFR 60 Appendix A. The observation results are required prior to issuance of an operation permit, and shall be submitted in duplicate to the Department of Environmental Regulation District Office, 7601 Highway 301 North, Tampa, Florida 33610. The visible emission test shall be conducted for one hour.

17-2.700

6. Issuance of this permit does not indicate an endorsement or approval of any other required permits by this department.

7. Copies of test results as required by proviso 5 shall be sent by applicant to local program, Hillsborough County Environmental Protection Commission, 1900 Ninth Avenue, Tampa, Florida 33605.

8. The maximum product input to the storage system shall be 300,000 long tons per year of ~~wet~~ prilled sulfur with minimum moisture

9. Maximum operating ~~hour shall be 16 hr/day, 4 day/wk, 12 wk/yr for the ship unloading system and 24 hr/day, 7 day/wk, 52 wk/yr~~ on for the ship unloading system shall be 768 hrs/yr and and 8736 hr/yr for the truck loading system, 8736 hr/yr.

10. A gantry unloading system with a covered, tight-lip bucket and with a movable apron to cover the opening between the dock and discharge hopper shall be used during ship unloading operations. The maximum free ~~fall~~

fall height from the bottom of the bucket to the top of the hopper shall be ~~ten feet~~ limited to minimize fugitive emission.

11. A water spray nozzle system shall be employed at ~~precede~~ each free fall ~~stop~~ unloading transfer point and shall be in operation during transfer operations as required to control particulate emission. All inclined conveyors shall be covered with a hinged cover. A curbed, paved base shall be used for the containment of water and ~~sulfur~~ product from the spray system.

12. The tripper system shall have a telescoping discharge spout and the maximum free fall height shall be ten feet when loading the storage pile.

13. The storage pile shall be wetted by 28 "Rain Bird" sprinklers which shall provide full coverage of the storage area, to maintain a minimum 2% moisture content. The pile shall be stored in a curbed, paved base to contain product and water run off.

14. A good housekeeping program to ~~prevent fines generated~~ minimize the generation of fines by pay loader traffic shall be proposed to the Department and upon approval shall be made a condition of the operating permit.

15. Transfer of the wet prilled sulfur from the storage pile to truck shall be accomplished by a covered conveying system feeding an enclosed gravity discharge hopper which shall feed into a loading hatch of an enclosed hopper truck. Trucks with rolling tarpaulin covers shall not be used.

possibly 10% ship quantity ... only

H.W.L. Object!

16. Visible emissions emitted from the transfer points and storage pile shall not exceed 5% opacity

17. The moisture content of the prilled sulfur in the storage pile shall be tested daily from representative samples taken from at least four different points of the storage pile. * Results shall be available for inspection by the Department and shall be kept on file for a period of one year.

18. An ambient particulate air monitoring program shall be submitted to FDER for approval within sixty days from the issuance date of the permit and shall be made a condition of the operating permit.

19. Total particulate emissions shall not exceed 5.0 #/hr.

20. Emissions shall not exceed any emission rates established for prilled sulfur unloading and handling as determined by an LRACT determination.

not in orig permit - legal questions - taking of construction or (permit) or operation?

insert * A sampling program and analytical method shall be submitted to FDER for approval within 60 days of from the issuance date of the permit.

If, subsequent to the issuance of this permit, emission rates are established for prilled sulfur unloading and handling pursuant to LRACT, emission rates shall not exceed such LRACT emission standard. The applicant shall be given a reasonable period in which to comply with the LRACT standard.

DEPARTMENT OF ENVIRONMENTAL REGULATION

ROUTING AND TRANSMITTAL SLIP

ACTION NO

ACTION DUE DATE

	INITIAL / DATE
1. TO: (NAME, OFFICE, LOCATION) John Swee	
2.	
3.	
4.	

REMARKS:

List of people who attended our meeting in Tampa.

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 & REPT
- INITIAL & FORWARD
- DISTRIBUTE
- CONCURRENCE
- FOR PROCESSING
- INITIAL & RETURN

FROM: Martha Hall

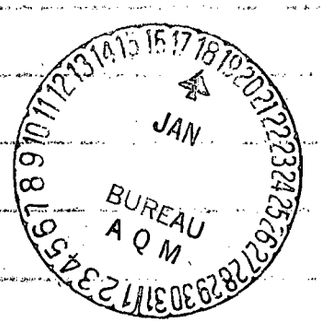
DATE 1/15

PHONE

Meeting 1/6/82

Agrico + DER

Name	Principal
Martha Hewell Hall	DER - Legal
JOHN SVEC	DER - BAQM
Dan Williams	DER - Tampa
Bob Curtis	Agrico - Tulsa
CURT INGEBRETSON	AGRICO - TULSA
HAROLD LONG, JR	AGRICO - PIERCE
William D. Nay	AGRICO -
Ed de la Parte	Agrico



Hills Plant 94

Agrico Bag Bed Terminal

	TPY
DC - A	8.0
B	1.2
C	1.2
D	1.8
E	1.8
F	6.0
G	1.2
H	1.2
J	3.6
K	3.6
L	1.2
A'	3.7
B'	0.6
C'	0.6
D'	0.6
E'	0.6
	35.9

existing truck dump wet rock only
sand dump @ ston bldg ? 400,000 TPY

229.45

AO 29-14854

4.38 TPY ← 193.55 TPY

1 lb/hr actual 44.19 #/hr process wt

18 #/day 99.8% eff Micropulsaire bag house

→ 3.285 TPY

supplement #2 outlet 0.02 gr/dscf → 0.614 #/hr

→ permit

Agrico Big Bend Terminal Technical Questions

from operating time

unload: 16 hr/day, 4 day/wk, 12 wk/yr (768 hr/yr) @ 588 TPH = 451,584 TPY transfer

transfer: 24 " 7 " 52 " (8736) @ 73.5 = 642,096 TPY unload

Appendix 300,000 long tons per year delivered. ⇒ 336,000 short tons per year

basis 0.05 % or less approximate contaminant content elsewhere 0.4% – 6.0% under 50 mesh sieve.

basis 90% control efficiency water spray system.

need swing-type crane for initial unloading or can gantry be installed.

application of chemical wetting agent to nugget?

300,000 TPY Prill

@ 8760 hrs/yr, 6% dust, 90% control

411. #/hr emissions 1800 TPY

---

600 TPH unloading rate

50,000 Tons on-site storage

900 - 1800 TPD output

300,000 TPY "

30,000 ton storage capacity vessel/month

load into 25 Ton capacity Trucks

% particles < 50 mesh (≈300 μm diameter)

0.4 initially (by wt)

up to 6.0 after transportation and handling

	Uncontrolled factor		% eff	controlled #/hr	Annual
unloading ship	0.3	#/ton	90	18.0	4.5
conveying to storage	0.6		90?	36.0	9.0
Loading onto pile	0.044		75-90	2.64	0.66
vehicular traffic	0.144		90	8.64	2.16
wind erosion	0.02		90	1.2	0.3
unloading pile	0.055		50	16.5	4.125
conveying to truck hopper	0.2		90	12.0	3.0
				94.98	23.745

---

25 μg/m³ max 24-hr concentration - PTMTP

10.4 μg/m³ AQDM

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

SOUTHWEST DISTRICT
7601 HIGHWAY 301 NORTH
TAMPA, FLORIDA 33610

REUBIN O'D. ASKEW
GOVERNOR

JOSEPH W. LANDERS, JR.
SECRETARY

Hillsborough County - AP
Agrico Chemical Company

Mr. Harold Long, Jr.
Manager, Environmental Control
Agrico Chemical Company
Post Office Box 1110
Mulberry, Florida 33860

RE: AC29-5954

Dear Mr. Long:

Pursuant to your recent application, please find enclosed a permit (No. AC29-5954) dated to construct the subject pollution source.

This permit will expire on , and will be subject to the conditions, requirements, and restrictions checked or indicated otherwise in the attached sheet "Construction Permit Conditions".

This permit is issued under the authority of Florida Statute 403.061(16). The time limits imposed herein are a condition to this permit and are enforceable under Florida Statute 403.161. You are hereby placed on Notice that the department will review this permit before the scheduled date of expiry and will seek court action for violation of the conditions and requirements of this permit.

You have ten days from the date of receipt hereof within which to seek a review of the conditions and requirements contained in this permit. Failure to file a written request to review or modify the conditions or requirements contained in this permit shall be deemed a waiver of any objections thereto.

Your continued cooperation in this matter is appreciated and in future communication please refer to your permit number.

Yours very truly,

P. David Puchaty
District Manager
Southwest District

cc: Central Files
R.T. Schneider

DEPARTMENT OF ENVIRONMENTAL REGULATION

ROUTING AND TRANSMITTAL SLIP

ACTION NO

ACTION DUE DATE

1. TO: (NAME, OFFICE, LOCATION) Steve Smallwood	INITIAL	
	DATE	
2.	INITIAL	
	DATE	
3.	INITIAL	
	DATE	
4.	INITIAL	
	DATE	

REMARKS:

This is the original draft permit for the Agrico solid sulfur terminal. Do we want to issue it as is or do some changes need to be made?

INFORMATION
- REVIEW & RETURN
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- INITIAL & FORWARD

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- INITIAL & FORWARD
- DISTRIBUTE
- CONCURRENCE
- FOR PROCESSING
- INITIAL & RETURN

FROM: Marti Hall -

DATE 11/18

PHONE

DEPARTMENT OF ENVIRONMENTAL REGULATION

ROUTING AND TRANSMITTAL SLIP

ACTION NO

ACTION DUE DATE

KAHL		FANCY		STAINES	
BLOMEL		THOMAS		MARY HALL	
BARKER		GEORGE		MARSHALL MOTT-SMITH	
J. ROGERS		PALAGYI			

11-25 REMARKS

John

What conditions would welcome for this if it were issued now, but under the rules that were in existence back in 1977. Walt & Dan Williams could help you with it.

Clair

INFORMATION
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- INITIAL & RETURN

FROM

STEVE SMALLWOOD

DATE

PHONE

XXSERIALXXXX No XXX 03089

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION

HILLSBOROUGH COUNTY

CONSTRUCTION PERMIT

FOR Agrico Chemical Company
Post Office Box 1110
Mulberry, Florida 33860

PERMIT NO. AC29-5954 DATE OF ISSUE ____________

PURSUANT TO THE PROVISIONS OF SECTIONS 403.061 (16) AND 403.707 OF CHAPTER 403 FLORIDA STATUTES AND CHAPTERS 17–4 AND 17–7 FLORIDA ADMINISTRATIVE CODE, THIS PERMIT IS ISSUED TO:

Mr. Harold Long, Jr., Manager, Environmental Control

FOR THE CONSTRUCTION OF THE FOLLOWING:
Prilled sulfur unloading, loading, storage and transfer terminal with fugitive dust emissions controlled by water sprays, covered conveyor belts and telescoping spouts. This permit is subject to the attached conditions, Nos. 1,2,3,4,5,6,7,8, 9,10,11,12,13.

LOCATED AT Agrico Big Bend Port Facility located between Ruskin and Gibsonton UTM: 17-361.0 E, 3076.25 N

IN ACCORDANCE WITH THE APPLICATION DATED September 19, 1977

ANY CONDITIONS OR PROVISOS WHICH ARE ATTACHED HERETO ARE INCORPORATED INTO AND MADE A PART OF THIS PERMIT AS THOUGH FULLY SET FORTH HEREIN. FAILURE TO COMPLY WITH SAID CONDITIONS OR PROVISOS SHALL CONSTITUTE A VIOLATION OF THIS PERMIT AND SHALL SUBJECT THE APPLICANT TO SUCH CIVIL AND CRIMINAL PENALTIES AS PROVIDED BY LAW.

THIS PERMIT SHALL BE EFFECTIVE FROM THE DATE OF ISSUE UNTIL ____________ OR UNLESS REVOKED OR SURRENDERED AND SHALL BE SUBJECT TO ALL LAWS OF THE STATE AND THE RULES AND REGULATIONS OF THE DEPARTMENT.

JWLanders Jr
JOSEPH W. LANDERS, JR.
SECRETARY

DISTRICT MANAGER

New Permit

DER Form PERM 11–1 (Mar. 76)

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

CONSTRUCTION PERMIT PROVISOS

AIR POLLUTION SOURCES

Permittee:

Permit No.:

(X) 1. Construction of this installation shall be completed by_____. Application for Permit to Operate to be submitted by_____.

(X) 2. This construction permit expires on_____following an initial period of operation for appropriate testing to determine compliance with the Rules of the Florida Department of Environmental Regulation.

(X) 3. All applicable rules of the Department including design limitations specified in the application shall be adhered to. The permit holder may also need to comply with county, municipal, federal, or other state regulations prior to construction.

(X) 4. The applicant shall continue the retention of the engineer of record for the inspection of the construction of this project. Upon completion the engineer shall inspect for conformity to construction permit applications and associated documents. A report of such inspection shall be submitted by the engineer to the Department of Environmental Regulation for consideration toward the issuance of an operation permit.

(X) 5. The operation of this installation shall be observed for visible emissions in accordance with Method 9-Visible Determination of the Opacity of Emissions from Stationary Sources, (Section 60, Appendix A: Federal Register Vol. 39, No. 291, November 12, 1974.) The observation results are required prior to issuance of an operation permit, and shall be submitted in duplicate to the Department of Environmental Regulation District Office, 7601 Highway 301 North, Tampa, Florida 33610. The visible emission test shall be conducted for one hour.

(X) 6. All fugitive dust generated at this site shall be adequately controlled.

(X) 7. Issuance of this permit does not indicate an endorsement or approval of any other required permits by this department.

(X) 8. Copies of test results as required by proviso 5 shall be sent by applicant to local program, Hillsborough County Environmental Protection Commission, 7402 North 56th Street, Building 500, Tampa Florida 33617.

(X) 9. The handling of prilled sulfur only is permitted.

(X) 10. Submit a proposed amtient air monitoring program within sixty days from date of the permit to the DER for approval.

(X) 11. If the Department determines excesive particulates are being emitted from the open conveyor, immediate steps shall be taken to have the conveyor convered.

(X) 12. Particulate emissions are limited to a maximum rate of 5 lbs/hour.

(X) 13. The moisture content of the prilled sulfur to be unloaded shall be at least 2%.

State of Florida

DEPARTMENT OF ENVIRONMENTAL REGULATION

INTEROFFICE MEMORANDUM

For Routing To District Offices And/Or To Other Than The Addressee

To: _____ Loctn.: _____

To: _____ Loctn.: _____

To: _____ Loctn.: _____

From: _____ Date: _____

TO: Jacob D. Varn
Victoria J. Tschinkel
Steve Fox
District/Subdistrict Managers

FROM: John C. Bottcher JCB
Mary F. Clark MFC

DATE: May 6, 1980

RE: Agrico Chemical Company v. Department of Environmental Regulation

---

Attached is a copy of the final judgment in the subject case which holds that the Department's denial of the air pollution permit for a sulphur unloading facility was not an unreasonable exercise of the State's police power constituting a taking without just compensation. This is the first final decision under 1978 Property Rights Act, §403.90, Florida Statutes, and is significant in that the court found that for a taking to occur the property would have to be rendered useless for all reasonable purposes.

JCB/bsh

cc: Terry Cole

DOCKETED 5/2/80

IN THE CIRCUIT COURT OF THE THIRTEENTH JUDICIAL CIRCUIT OF THE STATE OF FLORIDA, IN AND FOR HILLSBOROUGH COUNTY CIVIL DIVISION

AGRICO CHEMICAL CO., a foreign corporation,

Plaintiff,

vs

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION, a state agency,

Defendant.

CASE NO. 79-9408

DIVISION D

FINAL JUDGMENT

This is a Chapter 403.90 proceeding. By statute the only question to be considered is whether defendant's refusal to issue plaintiff a permit to construct a solid sulphur unleading facility on its property is a "taking". All other matters arising out of the antecedent administrative process must be reviewed by the District Court of Appeal. The issue presented is important because of the financial consequences to plaintiff and others in the industry.

The parties are properly before the Court; jurisdiction is rightfully invoked; plaintiff is a property owner with standing to sue; the proposed construction is a real or potential pollutant source subject to regulation by defendant under Chapter 403 of the statutes, and the facts are not essentially disputed. So the ultimate issue is to be decided by application of the proper rules of law.

After a plenary hearing, the hearing officer decided that the plaintiff's application for an "air" permit should be denied and this ruling was confirmed by the Department. Plaintiff contends

with force and persuasion that denial of the permit was such an egregious error as to amount to constitutional interference with its property rights. It is confiscatory says plaintiff primarily because:

(a) Defendant improperly placed the burden of proof on plaintiff to affirmatively establish that the proposed use of its property would not create an environmental hazard to the public, and there was no finding that any public detriment would occur if the facility was constructed.

(b) Defendant's action in denying the permit was inferentially due to intervention of giants in the sulphur industry having a vested interest in controlling prices and stifling competition from outside sources which it argued would take place if the planned facility were built and became operative.

(c) Plaintiff would suffer an enormous financial loss if it is precluded from construction of the facility by which it would import prilled sulphur at costs substantially less than prices of liquid sulphur from customary sources of supply.

Neither Section 403.90 nor its counterpart Section 308.085 provide any guidelines or standards by which to determine whether or not the agency action has so exceeded the reasonable police power of the state as to constitute a taking. So we are obliged to examine the body of case law stockpiled over the years to aid in the result.

Plaintiff relies heavily on Zabel v. Pinellas County, 171 So.2d 376 to support the argument that denial of the permit was indeed equivalent to a taking. A close look at the factual circumstances in that case reveals, however, that the landowner was given relief because if deprived of the permit requested he could not use the property for any other beneficial purpose. The same result was reached in its federal counterpart, Zabel v. Tabb, 430 F.2d 199, cert denied, 91 S. Ct. 873, 401 U.S. 910, 27 L. Ed 2d 808. The U.S. District Court was asked to find that denial of the

fill permit constituted a taking "since this is the only use to which the property could be put", but rejected this contention because of the federal government's sovereignty over the waters and subsurface lands.

The salient facts in this case show clearly that while plaintiff had a substantial financial stake in obtaining a permit to construct the facility, it did not and could not show that the property could not be used advantageously for business. Indeed, it was the site of wet phosphate rock operations used independent of the plans for the unloading facility it hoped to construct, and moreover, the evidence indicates that permits were sought for other industrial uses incident to plaintiff's business and this occurred months after its unsuccessful attempt to build the solid sulphur terminal at the same location.

It is true that nonacquisitive governmental action may amount to a taking in a constitutional sense. United States v. Causley, 328 U.S. 256, 66 S. Ct. 1062, 90 L.Ed. 1206; Lenoir v. Porters Creek Watershed, 586 F. 2d 1081.

The better reasoned cases not only in Florida but elsewhere hold that a taking does not take place, however, unless the property cannot be utilized for any reasonable and proper purpose. Laurel Inc. v. State, 362 A.2d 1383, (Conn 1975), New Jersey Sports & Expo v. Giant Realty Assoc. 362 A.2d 1312, 1318 (N.J. 1976). The test has been said to be whether or not the regulation practically or substantially renders the land useless for all reasonable purposes. Just v. Marinette County, 201 N.W. 2d 761 (Wis. 1972).

One of the most complete statements of the law dealing with the subject of whether or not a land owner may claim infringement

of his constitutional rights by being precluded from development appears in Kent Island Joint Venture v. Smith, 452 F. Supp 455. In that case, the landowner sued a variety of public officials whom he alleged were conspiring to stifle his real estate development. On page 460 of the opinion it is stated:

> "Although governmental interference by regulation of the use of private property can constitute a de factor or constructive taking, there is no taking in the constitutional sense unless the interference is so substantial as to render the property worthless or useless. Steel Hill Development Inc. v. Town of Sanbornton, 469 F.2d 956, 963 (1st Cir. 1972); Smoke Rise, Inc. v. Washington Suburban San. Com'n. 400 F. Supp 1369, 1382 (D. Md. 1975). It is not enough that the regulation deprives the property owner of the most profitable use of the property, United States v. Central Eureka Mining Co. 357 U.S. 155, 168, 78 S. Ct. 1097, 2 L. Ed.2d 1228 (1958), or that the regulation causes a severe decline in the property's value. Goldblatt v. Town of Hempstead, 369 U.S. 590, 594, 82 S. Ct. 987, 8 L. Ed 2d 130 (1962). In Hadacheck v. Sebastian, 239 U.S. 394, 36 S. Ct. 143, 60 L. Ed. 348 (1915), a decline in value from $800,000 to $60,000 was found by the Supreme Court to be insufficient to constitute a taking. Before a court can conclude that there has been an unconstitutional taking of property, the government regulation must deprive the landowner of all reasonable use of his land. C.F. Lytle Co. v. Clark, 491 F.2d 834, 838 (10th Cir. 1974); see Donahoe Const. Co. v. Maryland National C. P. & P. Comm. 567, F.2d 603, 608 n. 13 (4th Cir. 1977).
>
> "Plaintiff has done no more than allege that the actions of the defendants have deprived it of the "most reasonable" use of its property and have resulted in "substantial decrease" in the property's value. These allegations are clearly insufficient to establish a taking in the constitutional sense. * * *
>
> "The effect on plaintiff of the governmental action here is little different from that of any zoning or land use decision made by local authorities. Plaintiff would like to maximize the profits it might expect to make by developing the land in a certain desired manner."

In Estuary Properties v. Askew_____So.2d_____, decided in December, 1979, the First District Court of Appeal rendered an opinion in an administrative case coming up under Chapter 380. It was noted that in that case the hearing officer, as here, failed to make any finding regarding the "taking" issue. That Court, however, proceeded to review the entire case and included within the sweep of its opinion disposition of the same points made by plaintiff in the present case. Point I in the Estuary opinion deals with sufficiency of the evidence to support the findings before the agency including how the burden of proof was applied. The arguments of plaintiff in the subject case, endeavored to be summarized in subparagraphs (a),(b) and (c) on the first page of this judgment, are believed to concern matters inextricably involved in the hearing process before the agency and as in Estuary must be reviewed by superior authority, not this Court. There was found to be a taking in the Estuary case. Why? Because the owner was deprived of the economically beneficial use of his property due to the public need for preservation of the mangrove forest in and upon it, and he was found to be entitled either to the permit or to compensation if the state chose to take the mangrove. All of plaintiff's arguments fall within the purview of Point I in Estuary.

There is a lack of any evidence to show that the agency's actions either interfere with plaintiff's use of its property for industrial purposes or that denial of the earnestly sought permit will deprive plaintiff of all reasonable or economically beneficial uses of the land so as to amount to a taking in the constitutional sense.

Accordingly, it is

ADJUDGED AND ORDERED that plaintiff take nothing by its complaint and that defendant go hence without day at plaintiff's cost.

DONE AND ORDERED at Tampa, Florida this 2nd day of May, 1980.

Marion Buell
CIRCUIT JUDGE

CC: Counsel of record

de la PARTE AND BUTLER, P.A.
ATTORNEYS AT LAW

JAMES T. BUTLER
TRIAL PRACTICE/PERSONAL INJURY & WRONGFUL DEATH
WORKMEN'S COMPENSATION
TRIAL PRACTICE/GENERAL

EDWARD P. de la PARTE, JR.
GENERAL PRACTICE

LOUIS de la PARTE, JR.
ADMINISTRATIVE AND GOVERNMENTAL LAW
TRIAL PRACTICE/PERSONAL INJURY & WRONGFUL DEATH
TRIAL PRACTICE/GENERAL

BANKS B. VEST, JR.
ADMINISTRATIVE AND GOVERNMENTAL LAW
ENVIRONMENTAL LAW

403 NORTH MORGAN STREET
TAMPA, FLORIDA 33602
(813) 229-2775

June 25, 1979

Mr. John Bottcher
Department of Environmental
Regulation
2600 Blair Stone Road
Twin Towers Office Building
Tallahassee, Florida 32301

Re: Sulphur LRACT Rulemaking Proceedings
Case No. 78-5R

Dear John:

This letter is in response to Mr. William L. Earl's letter of June 19, 1979 in behalf of Freeport Sulphur.

First of all, as to the issue of incorporating the record in the Agrico sulphur permit case, Agrico Chemical Company will stick to the position stated by Mr. John Allen's letter dated June 18, 1979. However, in reviewing Mr. Earl's letter I notice that he cites several of the findings made in the appendix of the Hearing Officer's Recommended Order for your purview. This list is incomplete in that it is solely limited to those findings of fact submitted by Freeport Sulphur and Sulphur Terminals, which were adopted by the Hearing Officer. This list omits those findings of fact submitted by Agrico Chemical Company and those findings of fact submitted by Freeport and Sulphur Terminals, which were rejected by the Hearing Officer. In order to rectify this omission I have attached to this letter a list of such findings.

On behalf of my client, Agrico Chemical Company, I would urge you to read these attached findings in conjunction with those findings submitted by Freeport Sulphur Company.

Sincerely,

Edward P. de la Parte, Jr.

Edward P. de la Parte, Jr.

EdlP/yl
Enclosure

cc: Mr. W. D. Frederick, Chairman
Terry Cole, Esquire
Ms. Mary F. Clark, Deputy
General Counsel
Mr. Jacob D. Varn, Secretary
Dewey A. Dye, Jr., Esquire
The Izaak Walton League of
America
Hillsborough Environmental Coalition

LATEST REASONABLY AVAILABLE CONTROL TECHNOLOGY

A compilation of the Department's findings adopted from the Appendix to the Recommended Order which were omitted by Freeport's letter dated June 19, 1979

I. Agrico's Findings of Fact Adopted by the Department

10. In its standing case, Freeport has failed to show environmental injury to the public at larage as a result of the anticipated construction of a prill sulphur terminaling facility by Agrico.

11. In its standing case, S.T.I. has failed to show environmental injury to the public at large as a result of the anticipated construction of a prill sulphur terminaling facility by Agrico.

20. Molten sulphur terminal facilities commonly emit carbon disulfide and hydrogen sulfide.

21. It is the position of the Justice Department of the United States that Freeport's attempt to restrain the importation of solid form prill sulphur into the State of Florida is anti-competitive in nature.

44. The air modeling results produced by Agrico's engineer, Mr. Buff, constitutes the most reasonable and reliable air modeling done in the case for the proposed Agrico facility.

47. Dr. Lundgren's methodology was the most appropriate for determining an emission factor ... .

53. PVC prill is the best quality prill manufactured for the Canadian prill market.

62 & 63. Testimony and photographs established that the commercial handling of PVC prilled sulphur in a moist condition at Strachen and Vancouver emitted virtually no visible dust.

80. The Department experts and personnel have determined that the estimated emission rate for the Agrico facility will be 4.95 pounds per hour.

81. Agrico experts determined at the time of the filing of the application for construction of an air pollution source that 3.96 pounds per hour of particulate matter would be emitted from the facility.

82. Dr. Dale Lundgren, consultant for Agrico, determined emissions from the facility would be 1.01 pounds per hour.

86. Air Quality Display Model utilized by Agrico's experts predicted 3.1 micrograms per cubic meter for an annual period and 8 micrograms per cubic meter for the 24-hour period.

90. The Department has determined that there is no serious danger from the handling or terminaling of solid sulphur.

92. On May 26, 1977 Agrico conducted a test at its facility in Faustina, Louisiana, with a wet prill sulphur to determine its handling characteristics.

93. The result of this test was that no emissions of sulphur dust were observed by either the naked eye or mechanical monitoring methods.

II. Freeport's and Sulphur Terminal's Findings of Fact Which Were Rejected by the Department

129. That liquid-form sulphur transportation, handling and terminaling have minimal environmental impacts.

133. That the total maximum hourly emission rate for the Agrico facility is 151 pounds per hour.

134. That the 151 pounds per hour emission rates represents maximum emissions from the facility during one hour when all activities are in operation and assumes the use of a surfactent or wetting agent.

141. That the annual controlled emission rate of particulate matter from Agrico's proposed Big Bend facility will be 64 tons per year.

167. That there is no evidence on the record that Agrico's proposed facility will not emit particulate matter into the atmosphere at a density greater or equal to that designated as number one on the Ringleman Chart.

168. That there is no evidence on the record that Agrico's proposed facility will not emit particulate matter into the atmosphere with an opacity equal to greater than 20%.

169. That the ship unloading activity at Agrico's proposed facility will result in visible emissions of particulate matter.

170. That there is no competent substantial evidence that Agrico's proposed facility will not cause visible emissions in excess of those required by former Rule 17-2.04(1)b, Florida Administrative Code.

J.P.

John T. Allen, Jr.
Steven C. Sweet, Assoc.

Law Office of
John T. Allen, Jr. P.A.
4508 Central Avenue,
St. Petersburg, Florida 33711

Phone:
(813) 321-3273

June 18, 1979

Mr. John Bottcher
Department of Environmental Regulation
2600 Blair Stone Road
Twin Towers Office Building
Tallahassee, FL 32301

Re: Sulphur Transportation, Handling and Terminaling; LRACT Rulemaking; Case No. 78-5R

Dear Mr. Bottcher:

I am in receipt of a letter written to you by Mr. William Earl on behalf of Freeport Sulphur dated May 24, 1979.

I do not see any basis for incorporation into the record of the Hearing Officer's Findings and the Department's Findings as far as the LRACT rulemaking proceedings are concerned, and I wish to hereby enter my formal objection to such a procedure. It would seem to me that the "ERC" would have to order such being done before it is appropriately entered into any record as far as the ongoing LRACT proceedings are concerned.

As far as the resumption of the LRACT rulemaking proceedings are concerned, of course, that is up to the Department; however, I believe that the Department must determine whether or not the termination of "LRACT" for sulphur is feasible from a cost standpoint since the LRACT rule has been repealed and most importantly whether or not there is any ability on the part of the Department to have any idea as to what LRACT would be for sulphur. The Department has publicly told the ERC that it is unable to come up with such a rule or suggestions concerning a rule.

Continued, please . . .

Very truly,

John T. Allen, Jr.

JTAJr/jh

cc: William L. Earl, Esq.
R. L. Caleen, Jr., Esq.
Edward P. de la Parte, Esq.

~~J.P. Subramani~~
Walt Starnes

JAN 18 1979

REF: 4AH-AP

Mr. H. W. Lang, Jr., Manager
Environmental Control
Agrico Chemical Company
P. O. Box 1110
Mulberry, Florida 33860

Dear Mr. Lang:

We have been in contact with the Hillsborough County Environmental Protection Commission concerning your proposed prilled sulfur handling facility. Since you have not received your permit to construct from the Florida Department of Environmental Regulation by March 1, 1979, you may be subject to the Federal Regulations for the Prevention of Significant Deterioration. To make this determination, please submit information showing "potential" or uncontrolled emissions (tons per year) associated with the prilled sulfur handling facility.

If you have any questions, please contact me or Mr. Eliot Cooper of my staff at (404) 881-3286.

Sincerely yours,

Winston A. Smith, Chief
Air Programs Branch

cc: Mr. Dan Williams
Southwest District, Florida DER

Mr. Joe Griffiths
Hillsborough County

Dr. J. P. Subramani, Director
Florida DER

Enclosure

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
SOUTHWEST DISTRICT
7601 HIGHWAY 301 NORTH
TAMPA, FLORIDA 33610

REUBIN O'D. ASKEW
GOVERNOR

JOSEPH W. LANDERS, JR.
SECRETARY

January 20, 1978

CERTIFIED LETTER

Harold W. Long
Manager Environmental Control
Agrico Chemical Company
Post Office Box 1110
Mulberry, Florida 33860

Dear Mr. Long:

Re: AC29-5954 - Agrico Chemical Co.

Pursuant to Section 403.087 Florida Statutes and Section 17-4.07 Florida Administrative Code, the Department of Environmental Regulation hereby gives notice of its intent to issue a permit for the following:

Construction of a sulfur unloading, loading and transfer terminal to be located at Agrico's Big Bend Port Facility.

The Department's intent to issue this permit is based on the information submitted in the application. Since there are no similar prilled sulfur handling facilities readily available to obtain pollution emission data, the expected emission calculations were based on the loading, piling and storage of other types of aggregate utilizing similar equipment.

In evaluation of the information submitted in the application the Department finds:

1) The projected emissions are better than that allowed in the process weight table.

2) Ambient air standards for particulates will not be violated.

3) There will be no significant degradation of the ambient air quality.

4) In consideration of other bulk aggregate facilities and the possible explosion potential, the handling equipment and controls to be employed are considered best technology.

This permit shall be issued with the conditions listed on the attached construction permit proviso sheet.

EXHIBIT "D"

This Department shall issue the subject permit unless an appropriate petition is filed for a hearing pursuant to the provisions of Section 120.57, Florida Statutes. At such formal hearing all parties shall have an opportunity to present evidence and argument on all issues involved, to conduct cross-examination and submit rebuttal evidence, to submit proposed findings of fact and orders, to file exceptions to any order or hearing officer's recommended order and to be represented by counsel.

Any petition for a hearing must comply with the requirements of Florida Administrative Code, Section 28-5.15 (copy enclosed) and be filed (postmarked) with the Secretary of the Department of Environmental Regulation at Twin Towers Office Building, 2600 Blair tone Road, Tallahassee, Florida 32301, with a copy to this office within fourteen (14) days from receipt of this letter. Petitions which are not filed in accordance with the above provisions may be subject to dismissal.

Sincerely yours,

P. David Puchaty
District Manager

J. Harry Kerns
District Engineer

Attachment

cc. Mr. Peter Maruca
Mr. John Harlee
Mr. Roger Schwenke
Mr. Lewis de la Parte, Jr.
Mr. Dewey A. Dye, Jr.
HCEPC

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

CONSTRUCTION PERMIT PROVISOS

ittee: Agrico

it No. AC29-5954

AIR POLLUTION SOURCES

1. Construction of this installation shall be completed by _____. Application for Permit to Operate to be submitted by _____ 1978.

2. This construction permit expires on November 15, 1978 following an initial period of operation for appropriate testing to determine compliance with the Rules of the Florida Department of Environmental Regulation Commission.

3. All applicable rules of the Department including design limitations specified in the application shall be adhered to. The permit holder may also need to comply with county, municipal, federal, or other state regulations prior to construction.

4. The applicant shall continue the retention of the engineer of record for the inspection of the construction of this project. Upon completion the engineer shall inspect for conformity to construction permit applications and associated documents. A report of such inspection shall be submitted by the engineer to the Department of Environmental Regulation for consideration toward the issuance of an operation permit..

5. The operation of this installation shall be observed for visible emissions in accordance with Method 9-Visible Determination of the Opacity of Emissions from Stationary Sources, (Section 60, Appendix A: Federal Register Vol. 39, No. 291, November 12, 1974. The observation results are required prior to issuance of an operation permit, and shall be submitted in duplicate to the Department of Environmental Regulation District Office, 7601 Highway 301 North, Tampa, Florida 33610. The visible emission test shall be conducted for one hour.

6. All fugitive dust generated at this site shall be adequately controlled.

7. Issuance of this permit does not indicate an endorsement or approval of any other required permits by this department.

8. Copies of test results are required by proviso 6 and shall be sent by applicant to local program, Hillsborough County Environmental Protection Commission, 7402 North 56th Street, Building 500, Tampa, Florida 33617.

9. The handling of prilled sulfur only is permitted.

10. Submit a proposed ambient air monitoring program within sixty days from date of the permit to the DER for approval.

(X) 11. If the Department determines excessive particulates are being emitted from the open conveyor, immediate steps shall be taken to have the conveyor covered.

(X) 12. Particulate emissions are limited to a maximum rate of 5lbs/hour.

Agrico
ONE OF THE WILLIAMS COMPANIES

September 19, 1977

Mr. Rodger Stewart, Director
HILLSBOROUGH COUNTY ENVIRONMENTAL PROTECTION COMMISSION
7402 North 56th Street
Building 500
Tampa, Florida 33610

Dear Mr. Stewart:

Enclosed are the original and four copies of our applications to construct an Industrial Wastewater Treatment and Disposal System and an Air Pollution Source. These applications are for our proposed construction of a handling facility at the existing Agrico Big Bend Terminal to unload vessels, store and transfer prilled sulfur. Appropriate support documents and data are included as part of the applications.

Also enclosed are the application fee checks to Hillsborough County and the State of Florida.

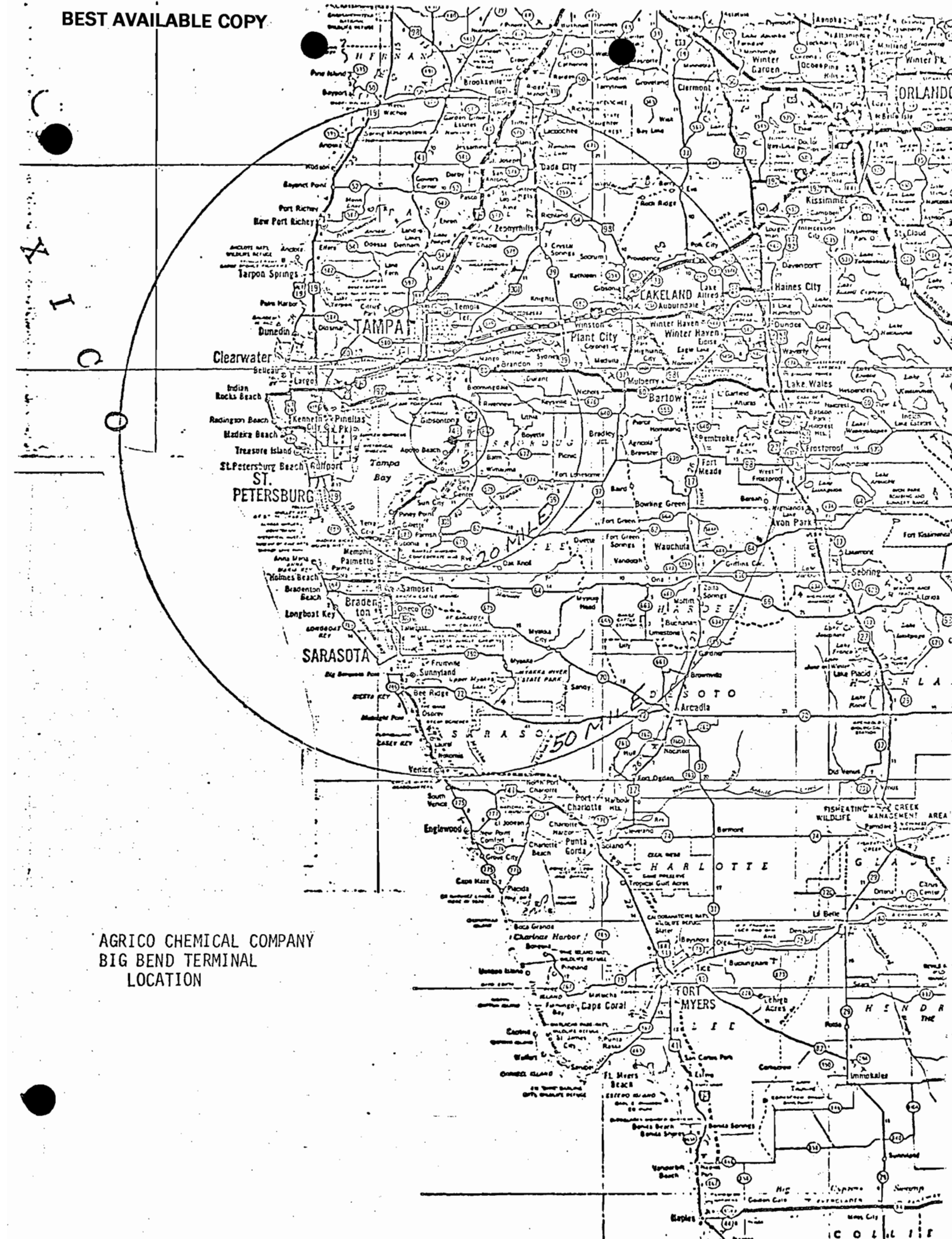
Very truly yours,

H. W. Long

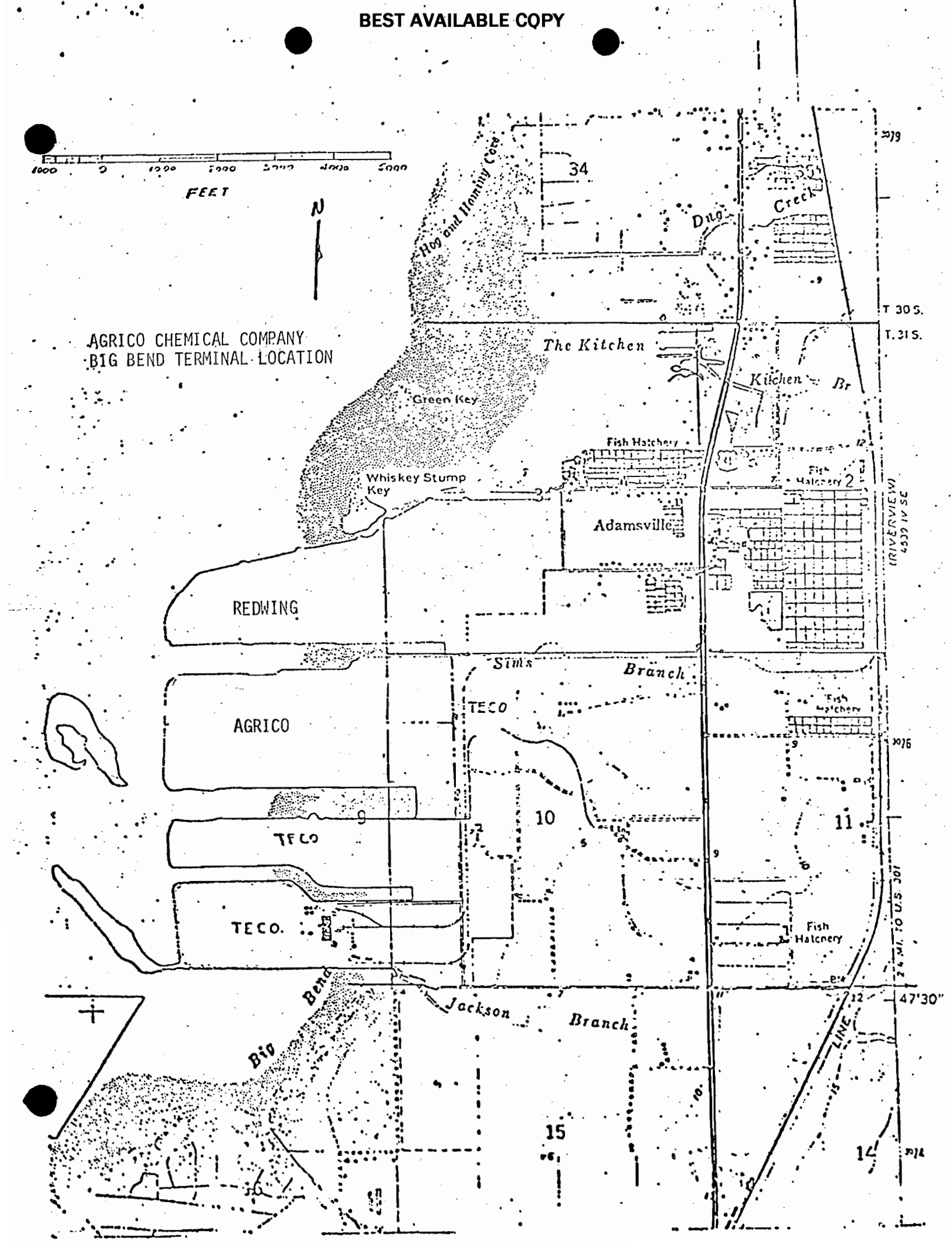
H. W. Long, Jr.
Manager
Environmental Control

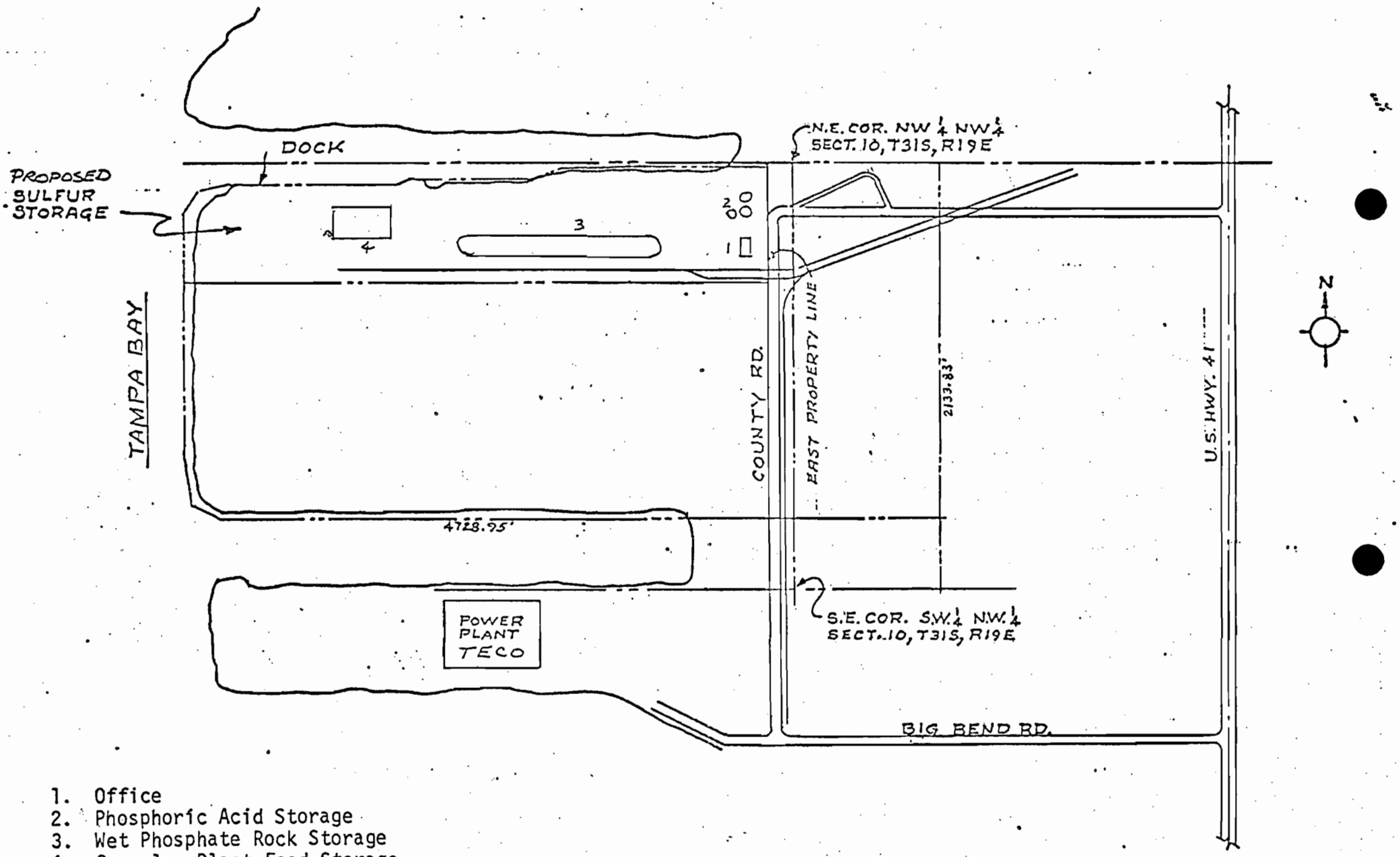
HWL,jr./jm
Enclosures

AIR PERMIT



AGRICO CHEMICAL COMPANY
BIG BEND TERMINAL
LOCATION

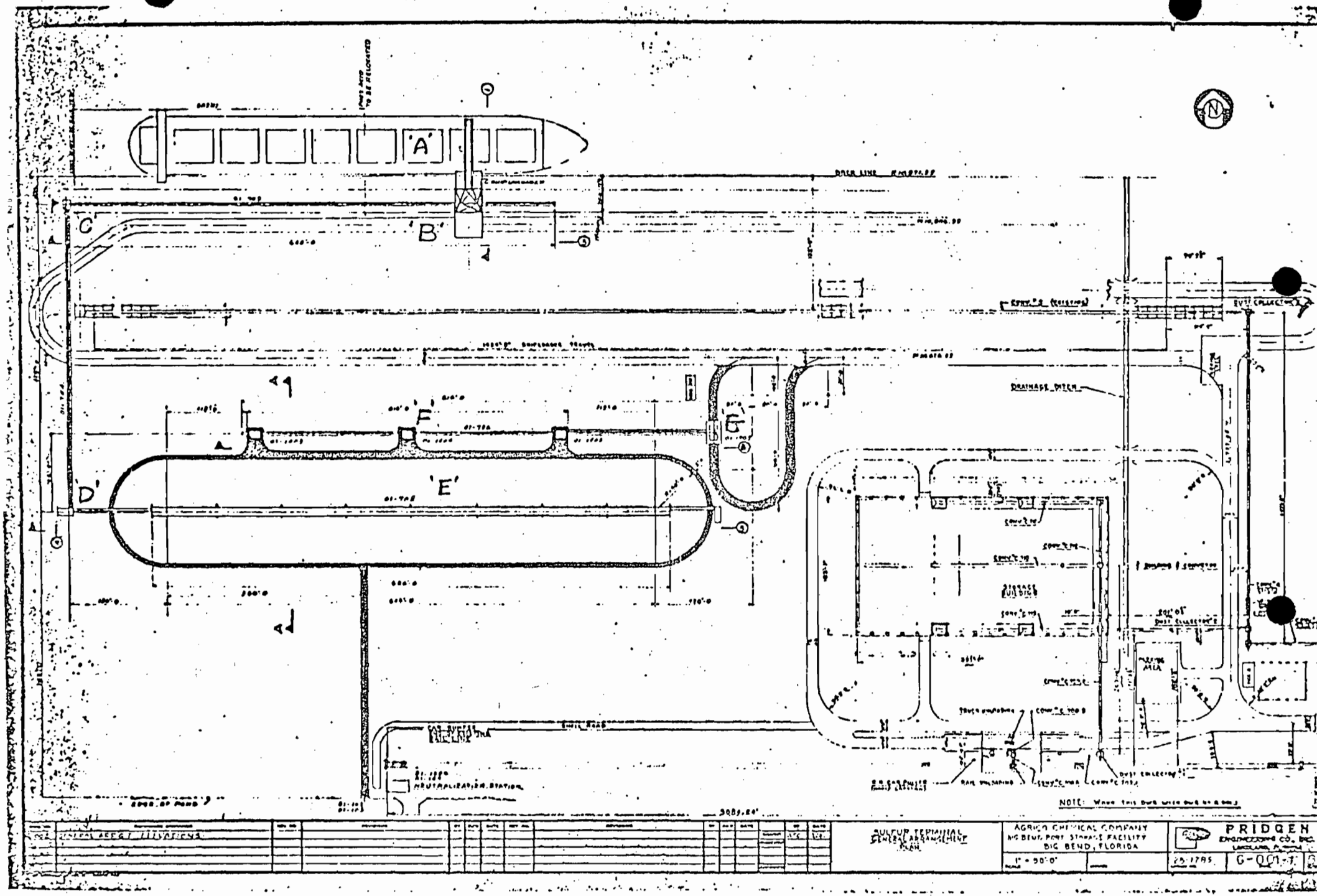




1. Office
2. Phosphoric Acid Storage
3. Wet Phosphate Rock Storage
4. Granular Plant Food Storage

AGRICO CHEMICAL CO.
BIG BEND PORT FACILIT
LOCATION PLAN

BEST AVAILABLE COPY



Agrico
ONE OF THE WILLIAMS COMPANIES

September 8, 1977

To Whom It May Concern:

Please be advised that the undersigned is Senior Vice President, Mining, Agrico Chemical Company, a Delaware corporation, with its principal office at One Williams Center, Tulsa, Oklahoma, hereafter called "Agrico." Mr. H. W. Long, Jr., Manager of Environmental Control of Agrico, is authorized to make, execute and submit to any appropriate federal, state or local government authority, in behalf of Agrico, any statement, application, request or the like, that is or shall be necessary, appropriate, or useful, for normal business activities.

Very truly yours,

AGRICO CHEMICAL COMPANY

By _____
R. G. Garcia
Senior Vice President - Mining

Agrico Chemical Company • P. O. Box 1110 • Mulberry, Florida 33860
813/428-1431

State of Florida

DEPARTMENT OF STATE • DIVISION OF CORPORATIONS

I certify from the records of this office that AGRICO CHEMICAL COMPANY is a corporation organized under the laws of the State of Delaware and is duly authorized to transact business within the State of Florida, qualified on May 11, 1977.

The charter number for this corporation is 826158.

I further certify that said corporation has filed all annual reports and paid all annual report filing fees due this office through December 31, 1977, and its status is active.

Given under my hand and the Great Seal of the State of Florida, at Tallahassee, the Capital, this the 8th day of September, 1977.

Jesse A. Smathers

SECRETARY OF STATE

CER 101 8-15-77

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

Source Type: Air Pollution [X] Incinerator [ ]

Type application: [ ] Operation [X] Construction

Source Status: [X] New [ ] Existing [ ] Modification

Company Name: Agrico Chemical Company County: Hillsborough

Source Identification: Big Bend Terminal

Source Location: Street: N.A. City: N.A.

UTM: East 361000 M North 3076250 M

Appl. Name and Title: Harold Long, Jr. Manager, Environmental Control

Appl. Address: P. O. Box 1110, Mulberry, Florida 33860

STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative of* Agrico Chemical Company

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 provisions 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 nontransferable and I will promptly notify the Department upon sale or legal transfer of the permitted establishment.

Harold Long Jr. Mgr. Env. Control

Signature of the Owner or Authorized Representative and Title

Date: 9/16/77 Telephone No.: (813) 428-1431

*Attach a letter of authorization. If applicant is a corporation, a Certificate of Good Standing must be submitted with application. This may be obtained for a $5.00 charge from the Secretary of State, Bureau of Corporate Records, Tallahassee, Florida 32304.

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA

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 regulation of the Department. It is also agreed that the undersigned will furnish the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signature: Robert Schneider Mailing Address: Post Office Box 2008

Name: R. T. Schneider, Chief Process Engr. Lakeland, Florida 33803

(Please Type)

Company Name: Stearns-Roger Engineering Company Telephone No.: (813) 688-6041

Florida Registration Number: 12008 Date: September 16, 1977

(Affix Seal)

DETAILED DESCRIPTION OF SOURCE

A. Describe the nature and extent of the project. Refer to existing pollution control facilities, expected improvement in performance of the facilities and state whether the project will result in full compliance. Attach additional sheet if necessary.

See Appendix A

B. Schedule of Project Covered in this Application (Construction Permit Application Only).

Start of Construction: January, 1978

Completion of Construction: January, 1979

C. Costs of Construction (Show a breakdown of estimated costs for individual components/units of the project serving pollution control purpose only). Information on actual costs shall be furnished with the application for operation permit.

Spray Water Pump	$ 3,817
Reclaim Conveyor	167,310
Tanks and Hoppers	102,135
Loadout Structure	32,538
Piping	48,004
Paint	9,020
Concrete Foundations	8,168
Total	$370,992

D. For this source indicate any previous DER permits, orders, and notices; including issuance dates and expiration dates.

* AC 29-2305 12/21/73 to 8/21/75
** IC 29-2056 2/14/74 to 12/30/75
IC 29-2121 10/23/74 to 12/31/75
IO 29-2121 12/19/75 to 1/1/81

* AC 29-2360 9/16/74 to 9/6/75

AC 29-2432 9/1/75 to 1/1/77
AO 29-2432 11/2/76 to 10/31/78 (no orders or notices)

*Letters from agency indicated no operating permit necessary.
**Evaluation for no permit.

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? X Yes ____ No

AIR POLLUTION SOURCES & CONTROL DEVICES
(other than incinerators)

A. Identification of Air Contaminants:

1) [X] Particulates
a) [X] Dust (Fugitive) b) [ ] Fly Ash c) [ ] Smoke d) [ ] Other (Identify)

2) [ ] Sulfur Compounds
a) [ ] SO_x as SO_2 b) [ ] Reduced Sulfur as H_2S c) [ ] Other (Identify)

3) [ ] Nitrogen Compounds
a) [ ] NO_x as NO_2 b) [ ] NH_3 c) [ ] Other (Identify)

4) [ ] Fluorides 5) [ ] Acid Mist 6) [ ] Odor

7) [ ] Hydrocarbons 8) [ ] Volatile Organic Compounds

9) [ ] Other (Specify): _____

B. Raw Materials and Chemicals Used (Be Specific):

Description	Utilization Rate ~~lbs/hr~~ Tons/Hr.	Approximate Contaminant Content		Relate to Flow Diagram
		Type	% Wt.	
Prilled Sulfur				
(Bulk Unloading)	600	Dust	0.05 or less	A-B-C-D-E
(Transfer)	75	Dust	0.05 or less	F-G

C. Process Rate:

1) Total Process Input Rate (Units*): (588 tons/hr. - unload) (73.5 tons/hr. - transfer)
2) Product Weight (Units*): (588 tons/hr. - unload) (73.5 tons/hr. - transfer)
3) Normal Operating Time: 7 a.m. to 11 p.m., if seasonal describe: N.A.
hrs./day: 16/24 days/wk.: 4/7 wks/yr.: 12 (unloading) / 52 (transfer)

D. Airborne Contaminants Discharged:

Name of Contaminant	Actual** Discharge		Discharge Criteria Rate*	Allowable Discharge lbs./hr.	Relate to Flow Diagram
	lbs./hr.	T/yr.			
Dust					
(Unload)	2.64	1.01	lbs/hr.	48.02	A-B-C-D-E
(Transfer)	1.32	5.78	lbs/hr.	34.43	F-G

*Refer to Chapter 17-2.04(2), Florida Administrative Code.
(Discharge Criteria: Rate = lbs./ton P_2O_5, lbs./M BTU/hr., etc.)
**Estimate only if this is an application to construct.

E. Control Devices:

Name and Type (Model and Serial No.)	Contaminant	Efficiency*	Conditions of Operations	Basis for Efficiency Operational Data, Test, Design, Data
Water Sprays	Particulate	90	As needed	Test Data
(as needed)			during operation	Compilation of emission factors (AP-42) "Aggregate Storage Piles", 11.2.3
				Air Pollution, Vol. III A.C. Stern, Ed., Pg. 294

*See required supplement.

(Include any test data and/or design data for efficiency substantiation)

See supplements

F. Fuels: N.A.

Type (Be Specific)	Consumption*		Maximum Heat Input MMBTU/hr.
	Avg./hr.	Max./hr.	

*Units: Natural Gas – MCG/hr.; Fuel Oils, Coal – lbs./hr.

Fuel Analysis:

Percent Surfur: _____ Percent Ash: _____

Density: _____ lb./gal.

Heat Capacity: _____ BTU/lb. _____ BTU/gal.

Other Fuel Contaminants: _____

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

Liquid and solid waste to storage and holding pond (See Industrial Wastewater Permit Application and Appendix A)

H. Emission Stack Geometry and Flow Characteristics, (provide data for each stack): N. A.

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

Gas Flow Rate: _____ ACFM Gas Exit Temperature: _____ °F

Water Vapor Content: _____ %

INCINERATOR INFORMATION

N.A.

Type of Waste	Type O (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.: _____

	Volume $(ft.)^3$	Heat Release (BTU/hr.)	Fuel		Temp. (^oF)
			Type	BTU/hr.	
Primary Chamber					
Secondary Chamber					

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

Type of Pollution Control Device: [ ] Cyclone [ ] Wet scrubber [ ] Afterburner
[ ] Other (Specify): _____

Brief Description of Operating Characteristics of Control Device: _____

Ultimate Disposal of Any Effluent Other Than That Emitted From the Stack (scrubber water, ash, etc.): _____

Please Provide the Following Required Supplements For All Pollution Sources:

1. Total process input rate and product weight — show derivation.

2. Efficiency estimation — show derivation.

3. 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.

4. An 8½" x 11" plot plan showing the exact location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

5. An 8½" x 11" plot plan showing the exact location of the establishment, and points of airborne emissions in relation to the surrounding area, residences and other permanent structures and roadways.

6. Description and sketch of storm water control measures taken both during and after construction.

AGRICO CHEMICAL COMPANY

BIG BEND SULFUR TERMINAL

APPENDIX A - PROJECT DESCRIPTION AND SCOPE

The purpose of the project is to construct a handling facility at the existing AGRICO Big Bend Terminal to unload vessels, store, and transfer prilled nuggetized sulfur to trucks for shipment to the AGRICO South Pierce Plant.

Approximately 300,000 long tons per year is to be delivered in 30,000 LT ships and unloaded at 600 TPH with a traveling gantry using a 7 yd. covered tight lip bucket. The sulfur is conveyed from the unloading hopper, 640 ft. along the dock belt to the 415 ft. inclined covered transfer section, discharging to the 680 ft. overhead tripper conveyor, forming a 40 ft. high pile. The sulfur is moved from the 50,000 LT storage pile with two 5 yd. bucket loaders and a 618 ft. covered reclaim belt conveyor at 200 TPH to a 50 ton truck loading hopper.

The ship unloading berth will be located on the west end of the existing dock. Based on 300,000 LTPY this will require about ten trips per year. It will take about two days to unload the vessel. The sulfur will be transferred in 25 ton trucks at up to 75 TPH on a 24 hour basis. These compartmented hopper trucks will be sealed against leakage and provided with loading hatches and a bottom discharge. Trucks with rolling tarpaulin covers will not be used.

Ultimately, the 300,000 LTPY of prilled sulfur will be melted at South Pierce using excess steam from the Sulfuric Acid Plant process. Since steam for a molten storage and handling terminal system is not involved, this reduction in heating cost can be added to the total energy savings.

This reclaimed Canadian sulfur will come from producing sour gas wells and reserves. Of the several types of prilled material available, we have selected the form produced by the wet method. This material has distinct advantages in material handling and environmental control. The actual process conditions basically determine the product hardness, size distribution and overall quality. Material specifications will be maintained. The moisture can be maintained between 0.5 and 1.5 percent. In this wet condition it is an environmentally clean material.

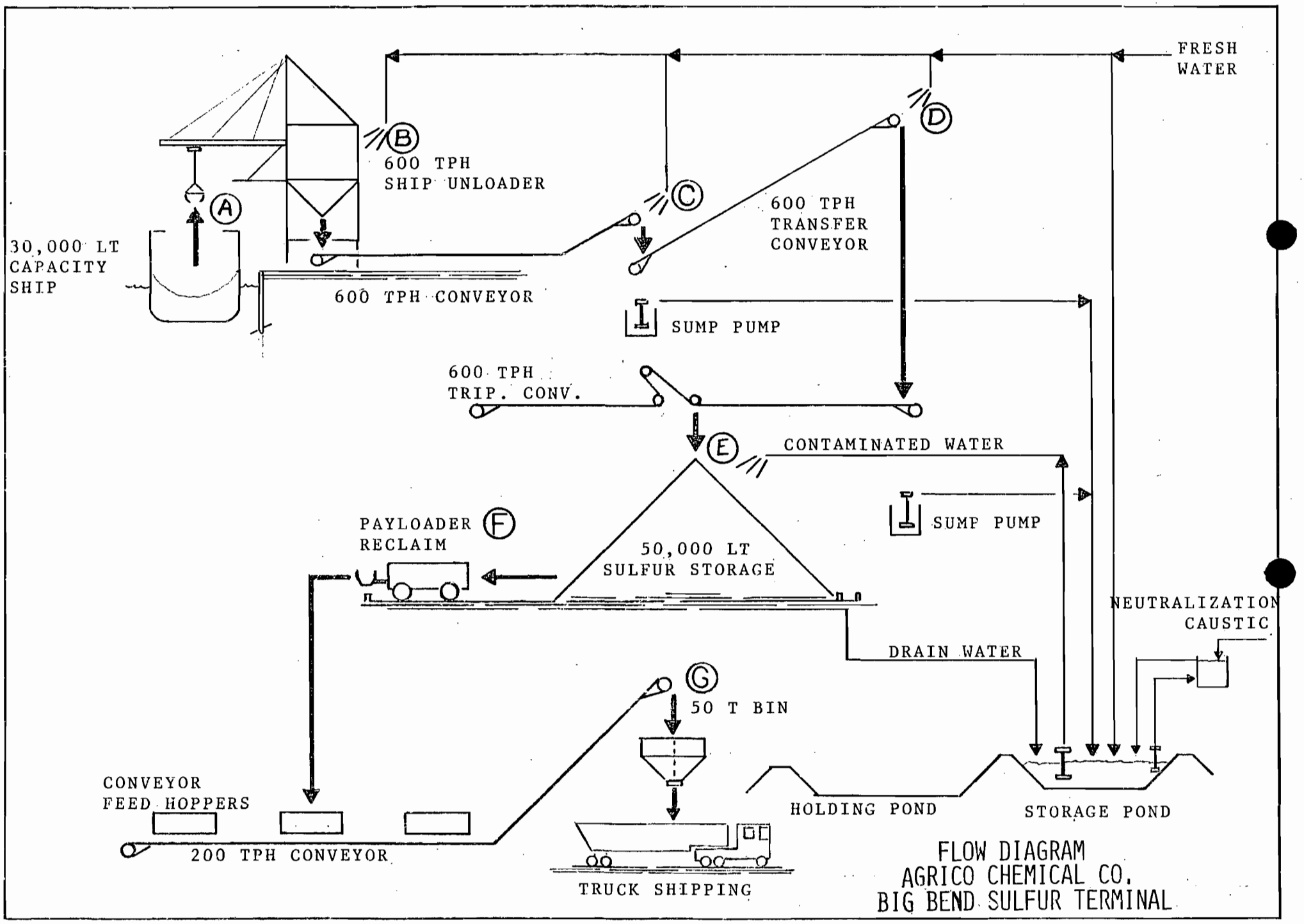
An important part of the equipment design concept is the containment of contaminants and minimizing housekeeping problems. Starting with a quality prilled sulfur and keeping it wet makes this basically a clean operation. The calculated discharge of airborne contaminants is less than 5 lbs/hr. for the combined unloading and truck transfer operation. The gantry unloading system (A) provides the minimum bucket travel, superior operator visibility and control and efficient hopper design. This arrangement also allows the use of a movable apron to cover the opening between the dock and discharge hopper (B) and the vessel. This hopper is equipped with water sprays. The conveyor transfer points at (C) and (D) also have sprays, belt cleaners and a curbed, paved base for containment of the small amounts of water and sulfur. The transfer conveyors are covered. In order to reduce the product free fall, after building the initial pile, the overhead conveyor will be operated to progressively move the discharge point along with the high point of the pile. The entire storage area (E) is provided with a full coverage spray system. Water will be added as required to maintain satisfactory moisture levels. In order to contain the product and runoff, the storage pad, reclaim aisle and loading areas are paved and curbed. The truck loading hopper is enclosed.

The development of the water balance shows that fresh water must

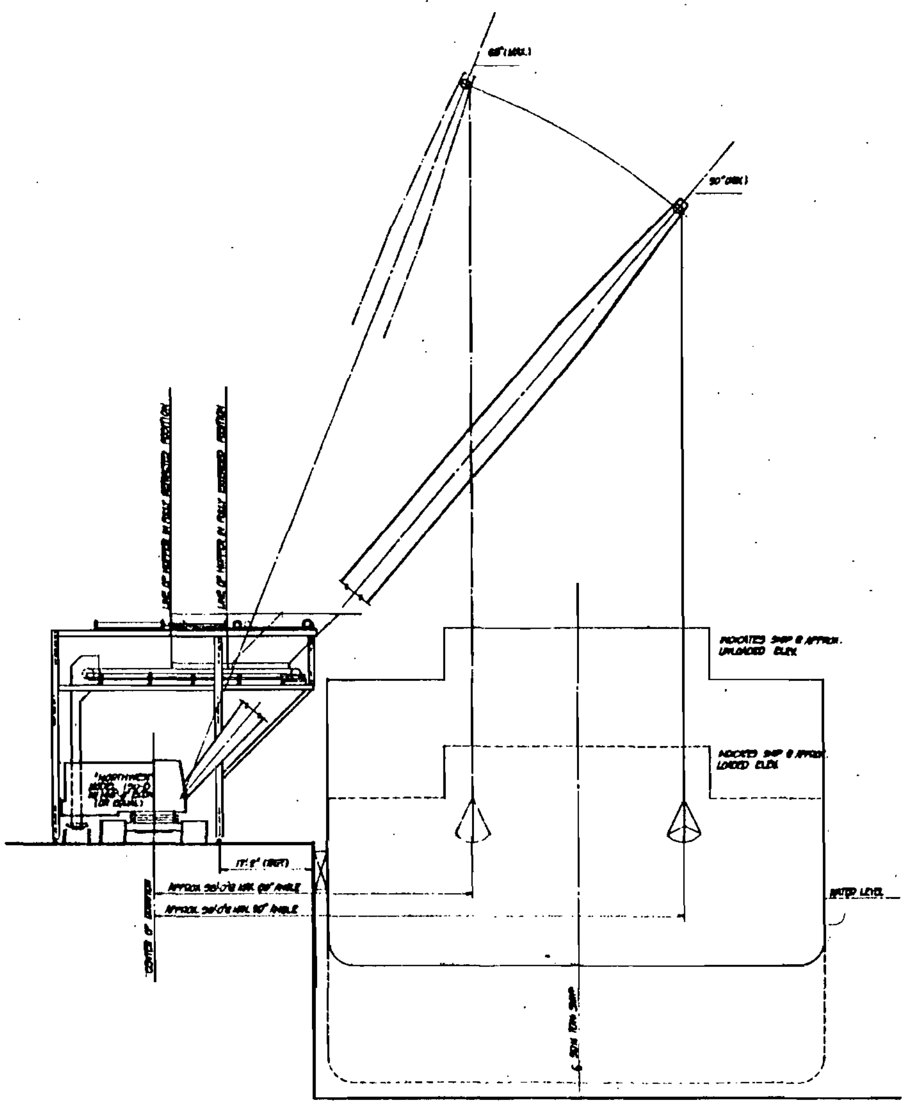
be added to the system in order to supply the sprays and maintain product moisture. The fresh water will normally be added at transfer points (B), (C) and (D). Recycle water from the treated retention pond will be used for the storage pile sprays (E). Contaminated water from the several sump pumps and the storage pile will be first drained to a settling tank and then to the lined retention pond. The recycle water is treated with liquid caustic in order to maintain a 6-9 Ph. The retention pond is designed for a 10 year rainfall. During the periods of extreme rainfall runoff, the water from the storage area will be diverted using overflow weirs to a 20 acre seepage pond. This cleaner water is then disposed of by evaporation and percolation.

The existing terminal facility was landscaped and is being well maintained. Most of this work was done on the east end of the property. In order to continue and preserve this good appearance, the west end will be further developed with additional trees and grassed areas.

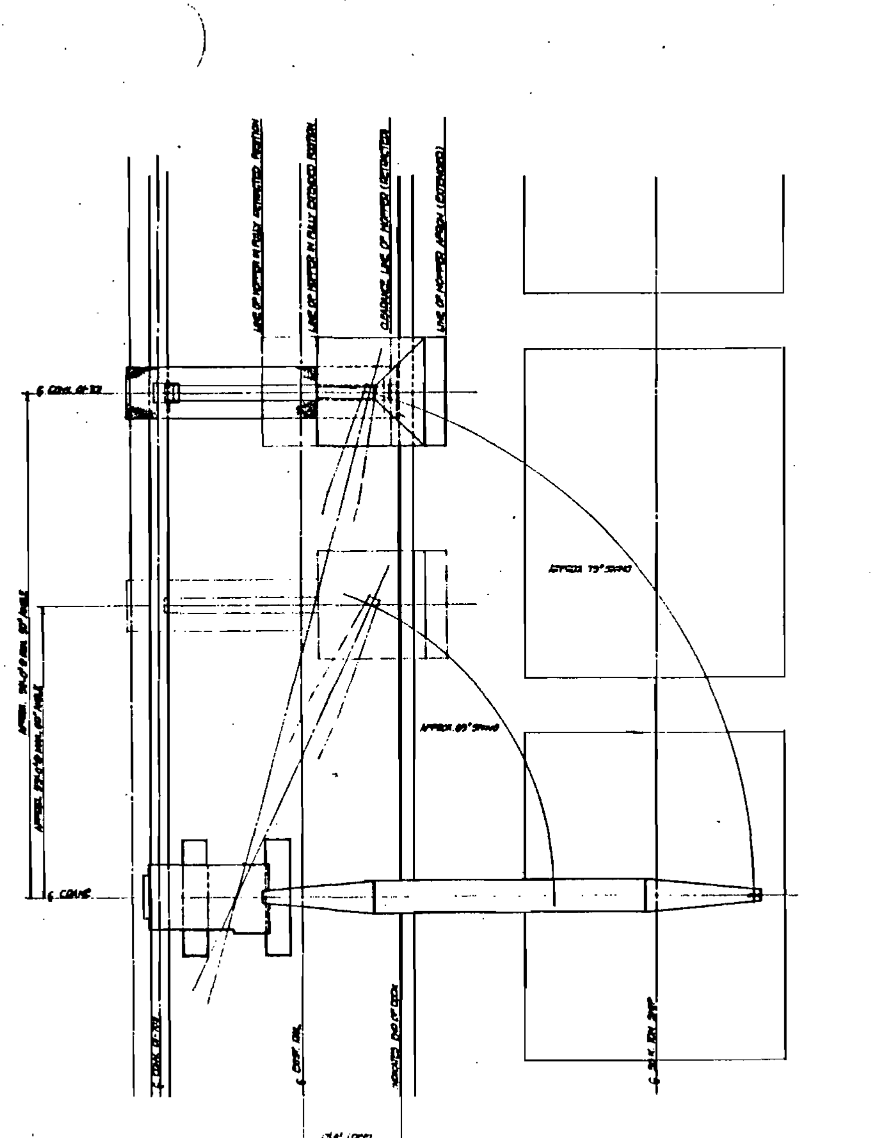
In order to meet our 1978 schedule, it will be necessary to temporarily use swinging type cranes for ship unloading. This will be for a 6 - 12 month period until the long delivery gantry equipment is received and erected. Similar attention to a clean operation will be made on the design of this unloading hopper and containment devices.



FLOW DIAGRAM
AGRICO CHEMICAL CO.
BIG BEND SULFUR TERMINAL



ELEVATION SCHEME NO. 1

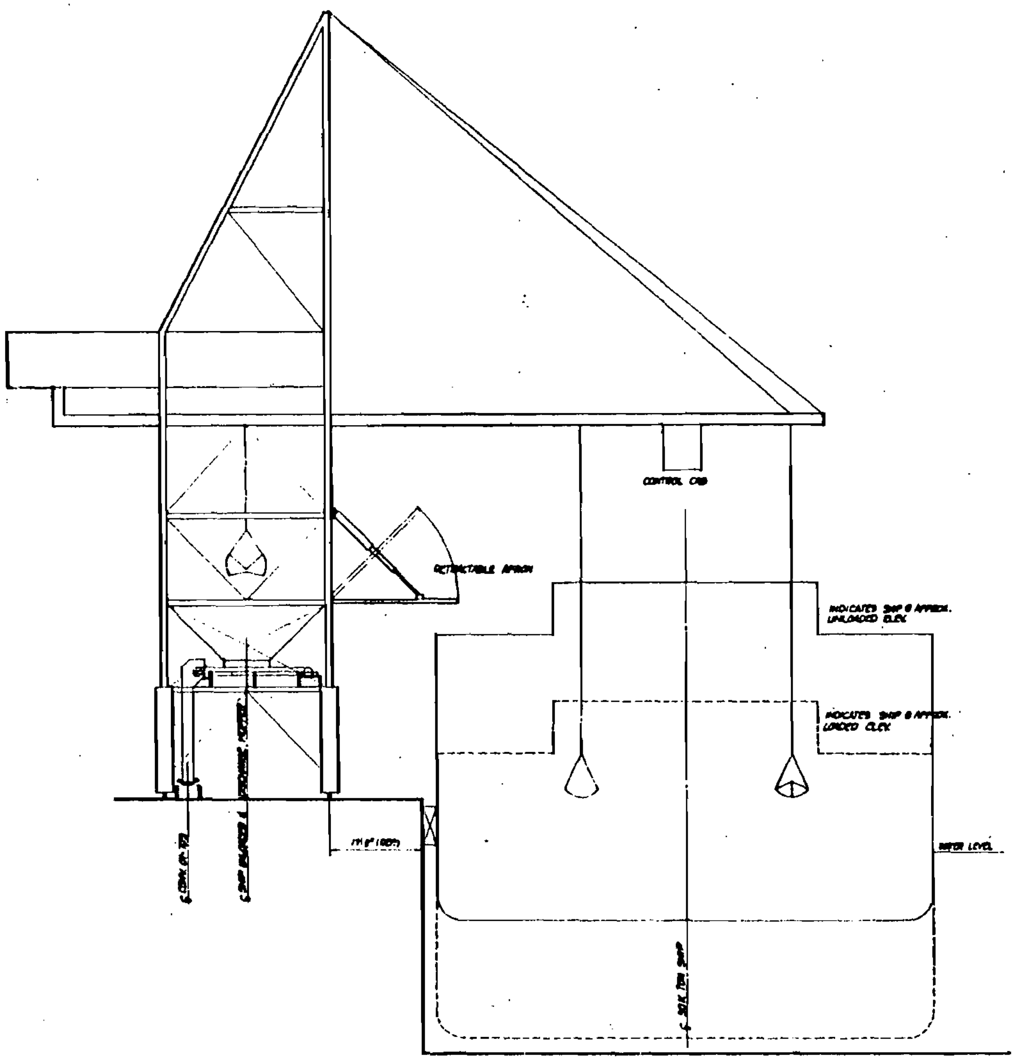


PLAN SCHEME NO. 1

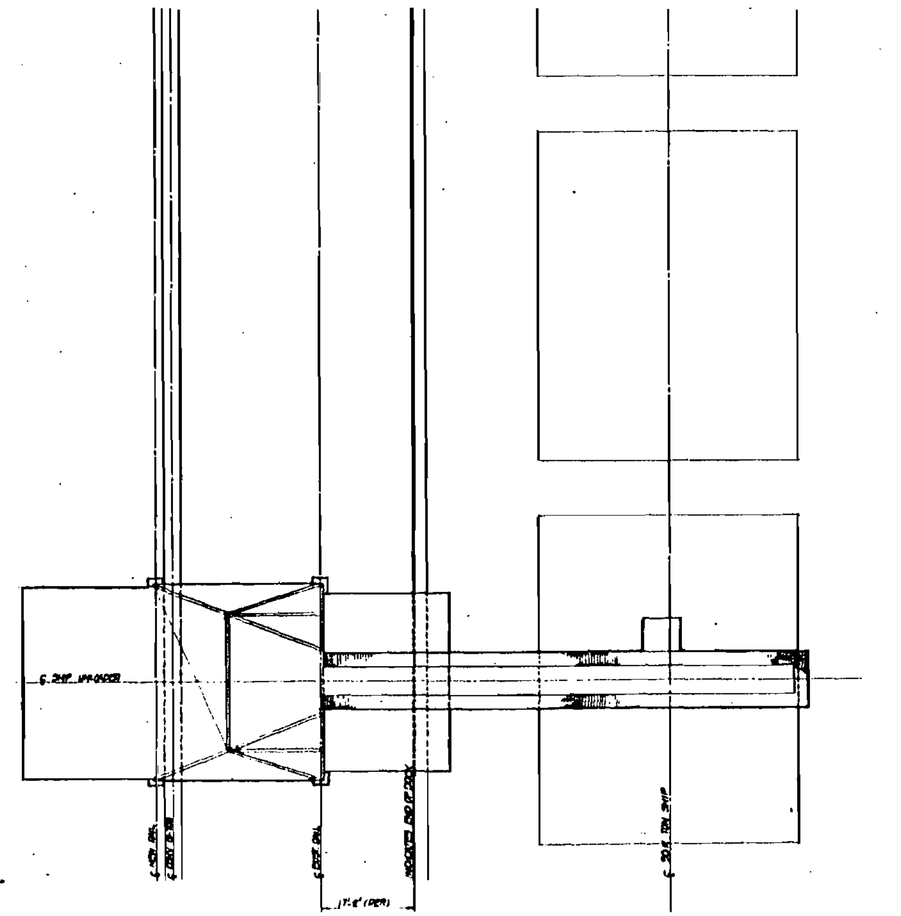
PRIDGEN ENGINEERING COMPANY
LAKELAND, FLORIDA
DIVISION OF JACOBS ENGINEERING COMPANY

AGRICO CHEMICAL COMPANY
BIG BEND PORT STORAGE FACILITY
BIG BEND, FLORIDA

APPROVED	SCALE	ORDER NO.	FOR CONSTRUCTION	CLIENT APPROVAL	DRAWING NO.	REV.
	1/32" = 1'-0"	26-1789			B-005	



ELEVATION SCHEME NO. 2

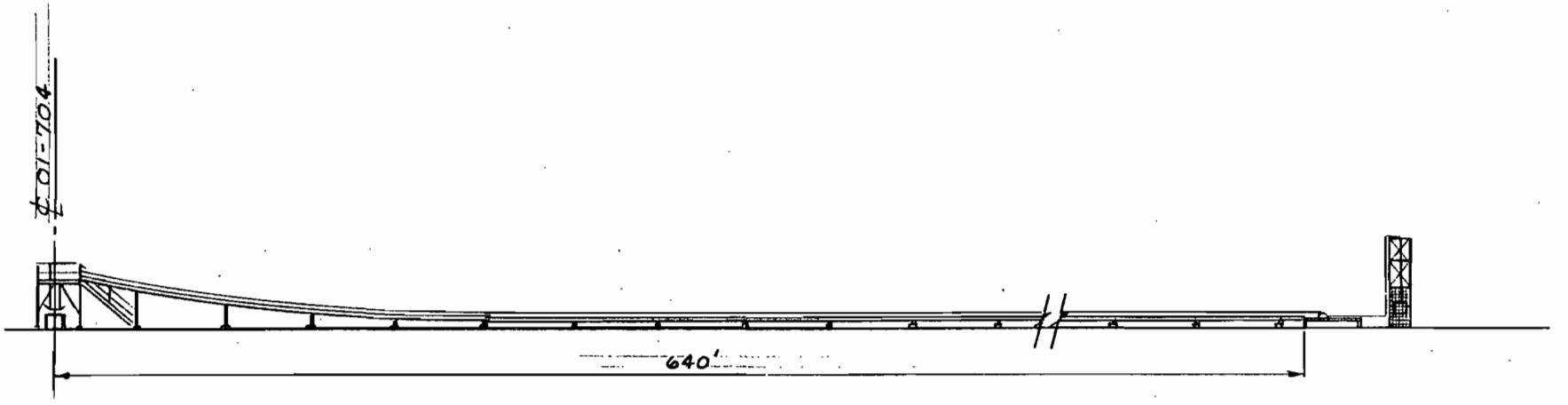


PLAN SCHEME NO. 2

PRIDGEN ENGINEERING COMPANY
LAKELAND, FLORIDA
DIVISION OF JACOBS ENGINEERING COMPANY

AGRICO CHEMICAL COMPANY
BIG BEND PORT STORAGE FACILITY
BIG BEND, FLORIDA

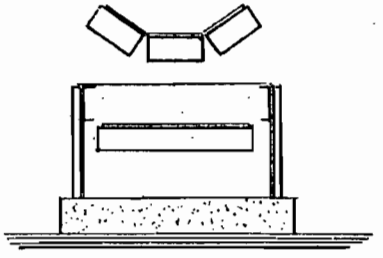
APPROVED	SCALE	ORDER NO.	FOR CONSTRUCTION	CLIENT APPROVAL	DRAWING NO.	REV.
	3/32" = 1'-0"	28-1789			B-004	



ELEVATION 01-703

36" BELT CONVEYOR - NO COVER

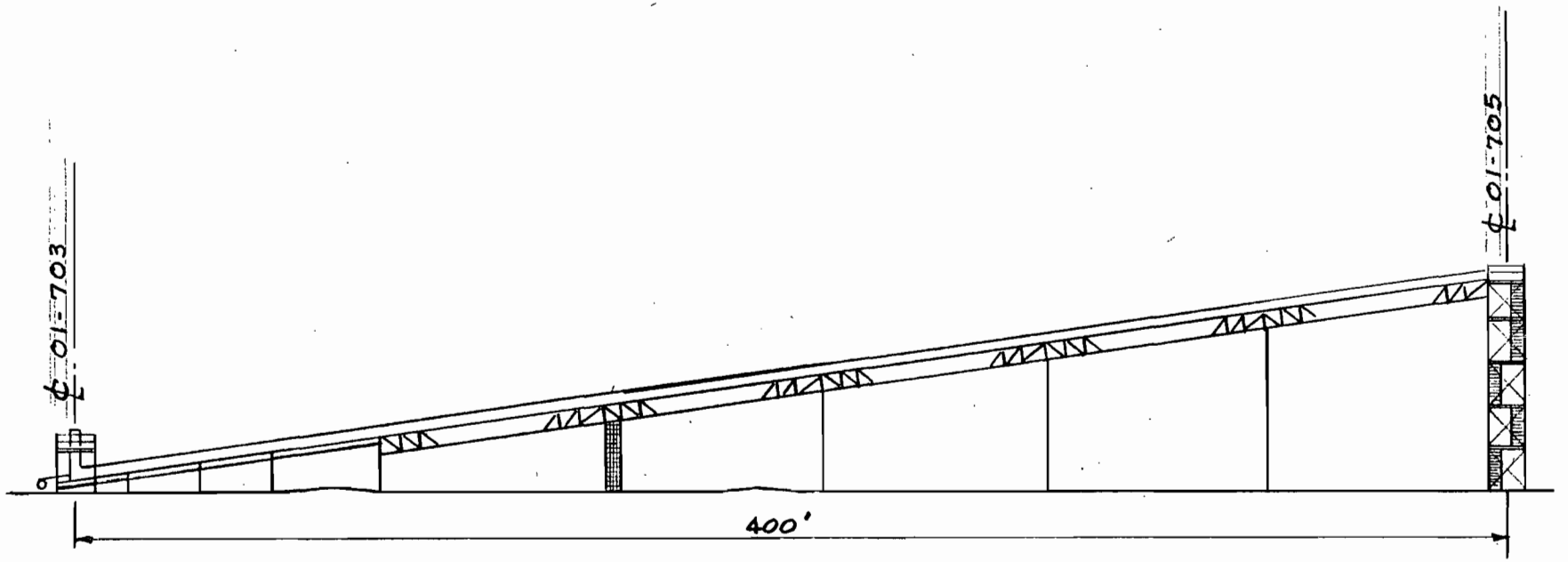
ELEVATION 3



TYPICAL SECTION

AGRICO CHEMICAL CO.

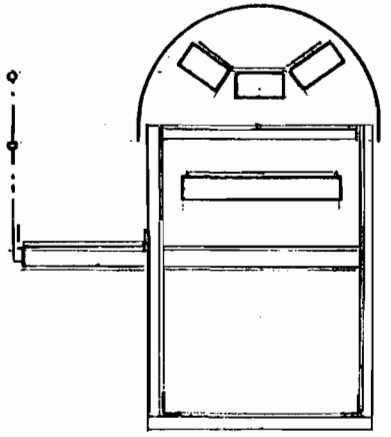
BIG BEND SULFUR TERMINAL



ELEVATION 01-704

36" BELT CONVEYOR-COVERED

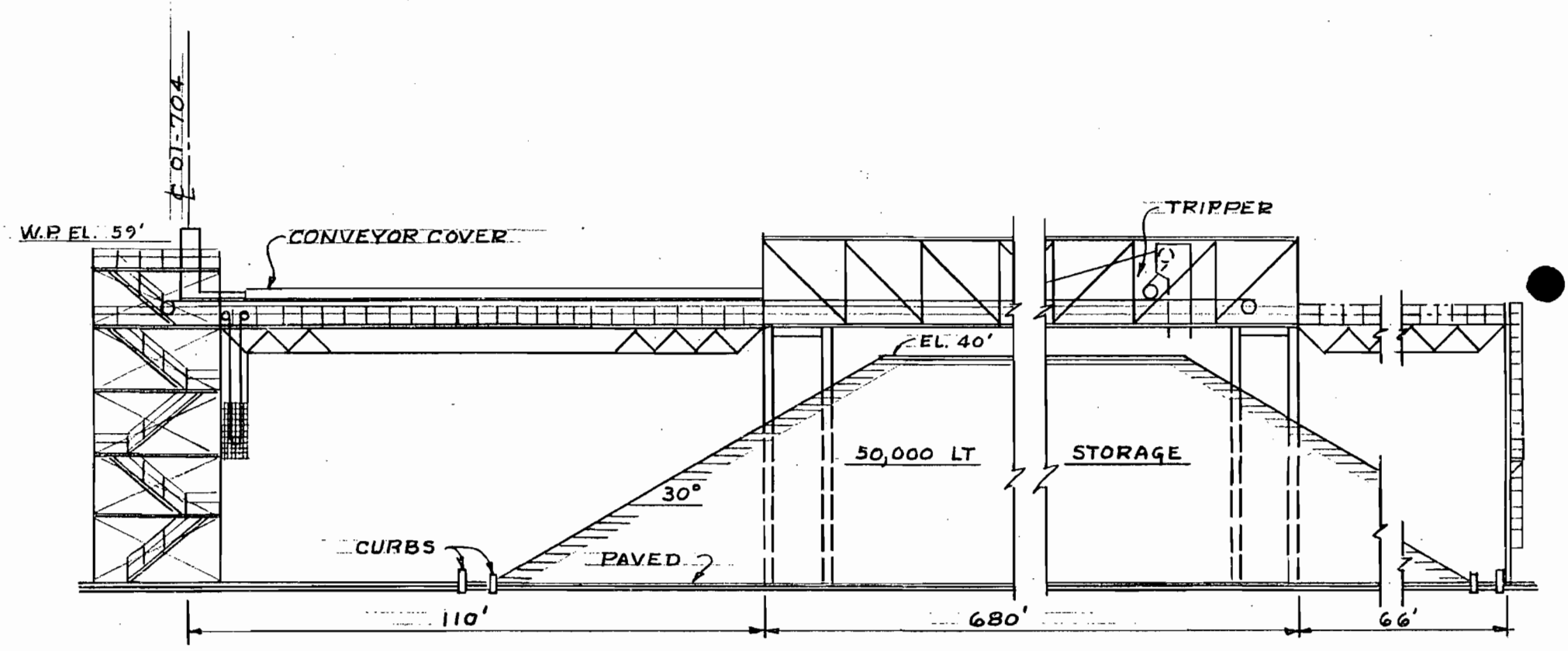
ELEVATION 4



TYPICAL SECTION

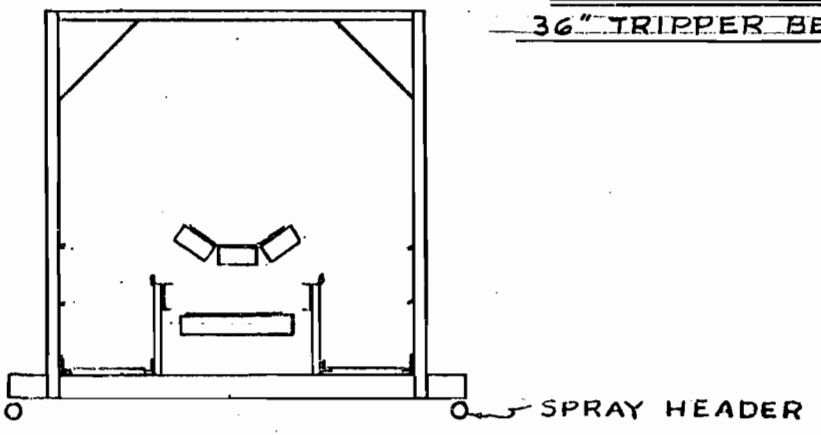
AGRICO CHEMICAL CO.

BIG BEND SULFUR TERMINAL



ELEVATION 01-705

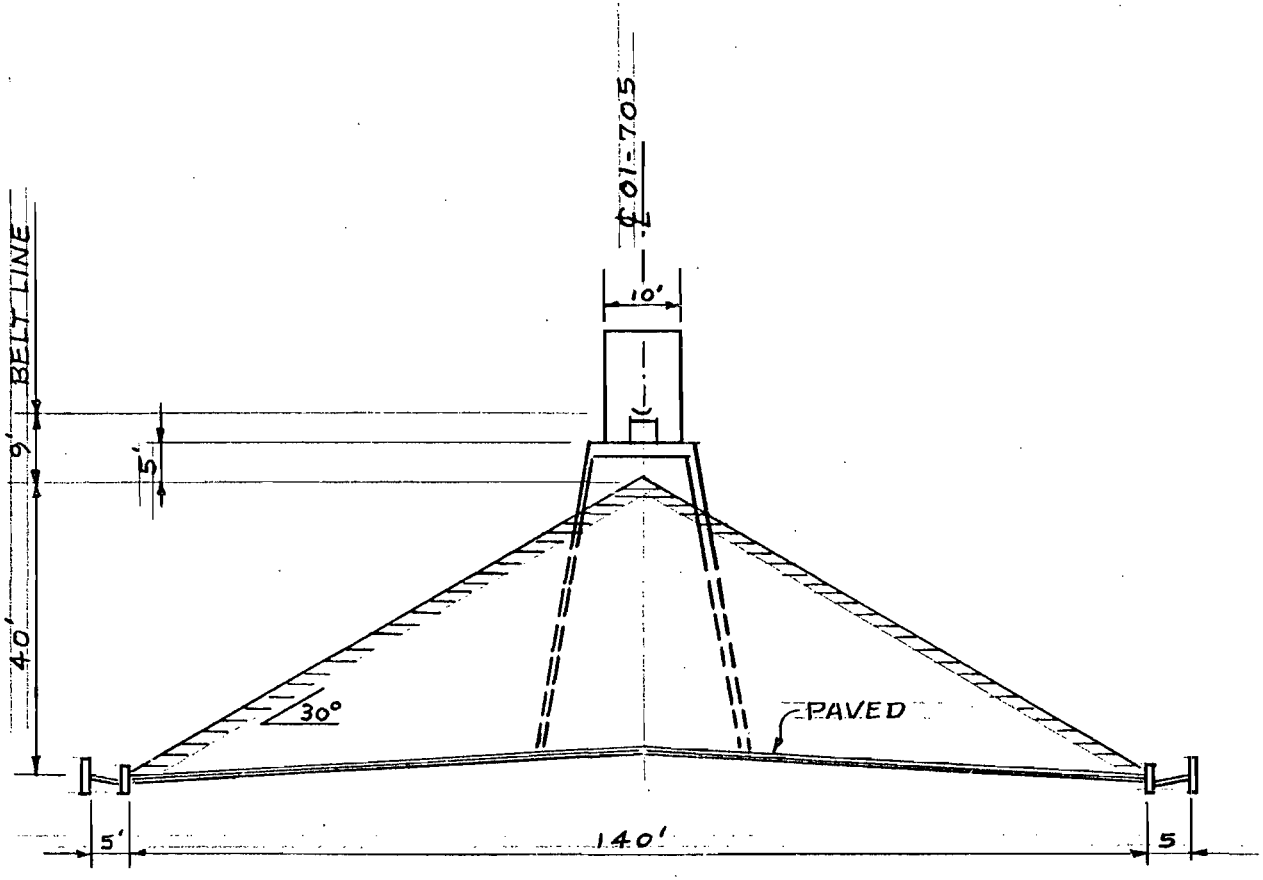
36" TRIPPER BELT CONVEYOR



TYPICAL SECTION

AGRICO CHEMICAL CO.

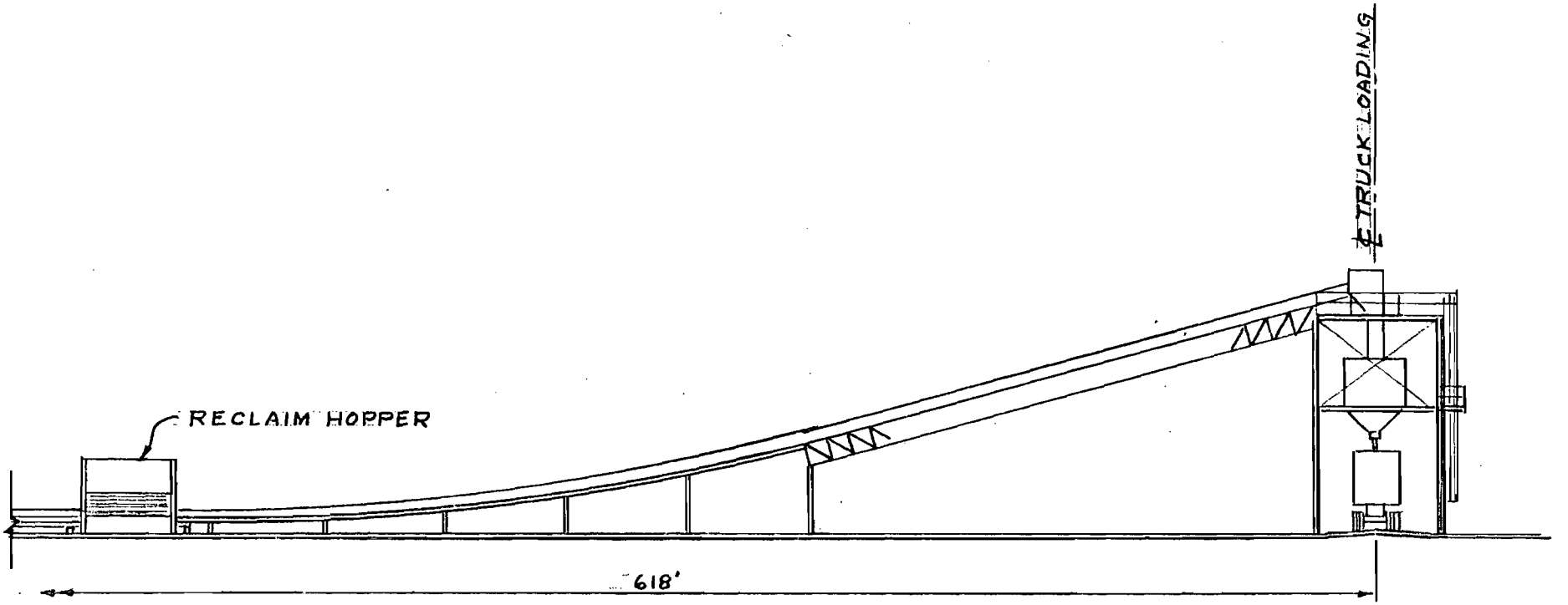
BIG BEND SULFUR TERMINAL



SECTION A-A

AGRICO CHEMICAL CO.

BIG BEND SULFUR TERMINAL



ELEVATION 01-706

30" COVERED BELT CONVEYOR

ELEVATION 6

AGRICO CHEMICAL CO.

BIG BEND SULFUR TERMINAL

Agrico Chemical Co.
Big Bend Sulfur Terminal
Water Balance, Annual

The containment of all waters that have contact with the sulfur prills is of prime environmental importance. These waters will be employed to maintain a moisture film on the surface of the sulfur prills to abate the release of sulfur particulate into the atmosphere.

Fresh water will be employed to mist spray the sulfur at the receiving hopper of the clamshell shipunloader and at the two transfer points on the conveyor system to the sulfur storage area. All water not adhering to the sulfur will be contained by paved areas at the transfer points and pumped to the storage pond.

Neutralized water will be recycled from the storage pond to the spray system above the sulfur storage area. The curbed storage area will be paved to prevent the escape of any contaminated waters. The drainage from the sulfur storage area to the storage pond will also be paved.

The paved drainage ditch to the storage pond will be sized to handle most rains. The advent of excessive rains in a short time duration or the deluge of a hurricane will flush the drainage system of sulfur particulate to the storage pond and the excess will be diverted to a holding pond that will permit the water to percolate into the ground.

The storage pond will be lined to prevent percolation and the transport of sulfur particulate into the ground and eventually into Tampa Bay. The pond will be equipped with ph monitoring instruments and a neutralization station employing liquid caustic to maintain a neutral ph to minimize corrosion of the sulfur storage structures from the spraying system.

The lake evaporation rates were used for these calculations as also the net area of the surface of the sulfur storage pile. The employment of these figures will make the excess evaporation tend to be conservative. The negative water balance indicates the contamination of Tampa Bay by water bourne sulfur particulate will be prevented.

Agrico Chemical Co.
Big Bend Sulfur Terminal
Water Balance, Annual

The prilled sulfur as received from the ship will have a moisture content of approximately 2% moisture. The port is scheduled to receive 300,000 long tons of sulfur annually.

$$\frac{300{,}000/T \times 2240\#/T \times .02}{62.4\#/CF} = 215{,}385 \text{ CF water}$$

The product transfer points will have mist sprays. The quantity of water will equal 2% of the tonnage transferred, 215,385 CF.

The annual mean precipitation accumulation on the area of paved storage (96,000 S.F.) is 52.38" (Climatic Atlas of the United States, U.S. Department of Commerce, Environmental Science Services Administration, Environmental Data Service).

96,000 SF X 4.3646 Ft. = 419,012 CF

The annual mean precipitation accumulation on the area of the storage pond (30,000 SF) is 52.38".

30,000 SF X 4.3646 Ft. = 130,938 CF

The air evaporation of the sprays on the storage area will approximate 1%. These calculations are based on a total volume of 500 gpm for a period of 12 hours per day and 365 days per year.

500 gpm = 67 CF/min. 1% = .67

0.67 CF/min. X 720 min/12 hrs. X 365 days = 176,076 CF

The product will be shipped at 2% moisture content. This will equal the amount of water present with the product as received, 215,385 CF.

The annual mean evaporation for the area of the paved storage is 51" (Climatic Atlas).

96,000 SF X 4.25 ft. = 408,000 CF

The additional surface (max.) of the storage pile will increase the area to 120,923 SF, an addition of 24,923 SF.

24,923 SF X 4.25 ft. = 105,922 CF

The annual mean evaporation for the area of the storage pond is 51".

30,000 SF X 4.25 ft. = 127,500 CF

Agrico Chemical Co.
Big Bend Sulfur Terminal
Water Balance, Annual

Units in cubic feet

2% moisture, 300,000 long tons	215,385	
2% moisture, transfer sprays	215,385	
Annual precipitation, Storage Area	419,002	
Annual precipitation, Storage Pond	130,938	
1% Loss, Storage Area Spray		176,076
2% Moisture, Shipped Product		215,385
Annual Evaporation, Storage Area		408,000
Annual Evaporation, Storage Pile		105,922
Annual Evaporation, Storage Pond		127,500
TOTALS	980,710 C.F.	& 1,032,883 C.F.

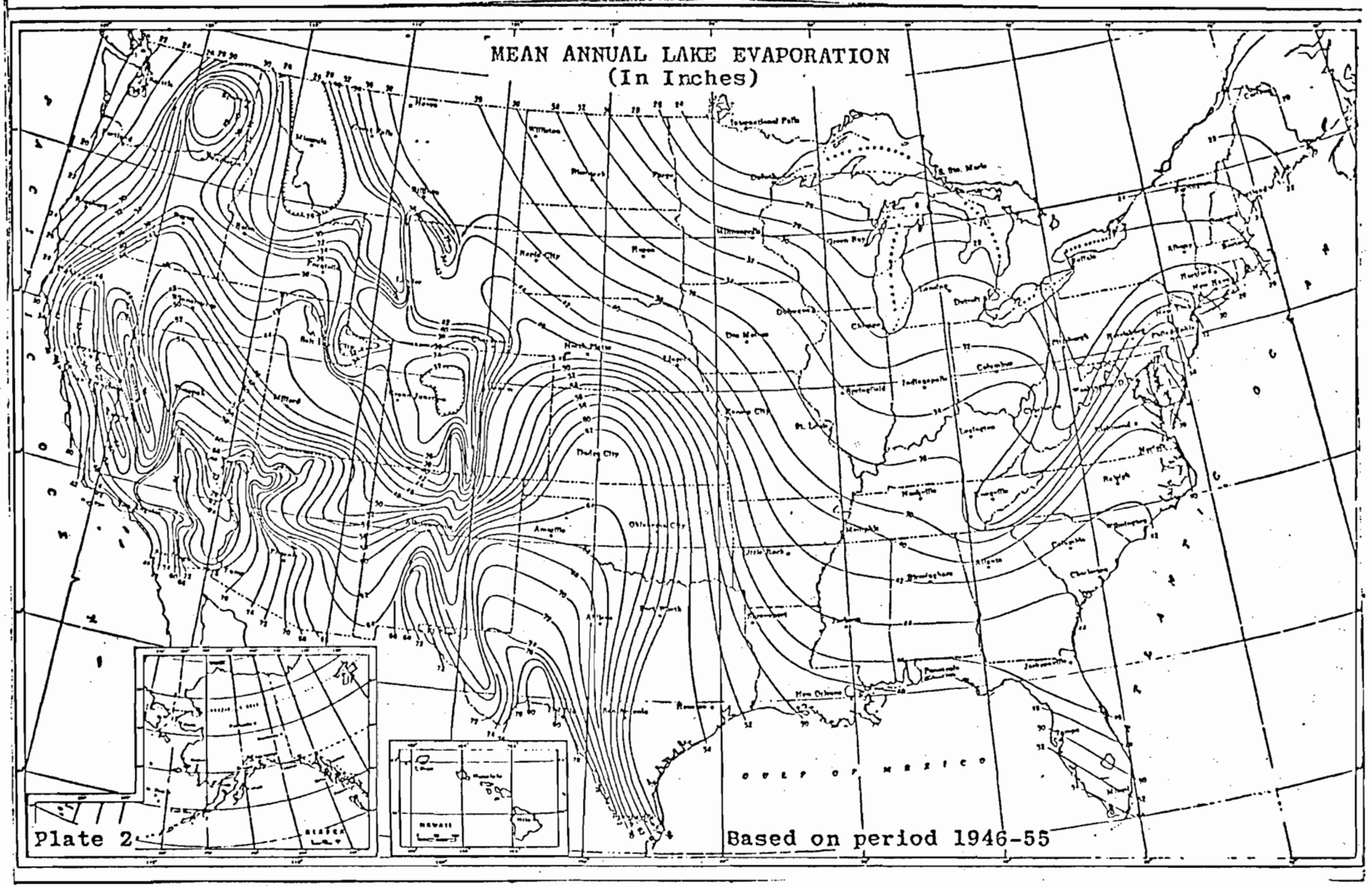
Excess evaporation (max. condition)	52,173 C.F.
Excess precipitation (min. condition)	53,749 C.F.

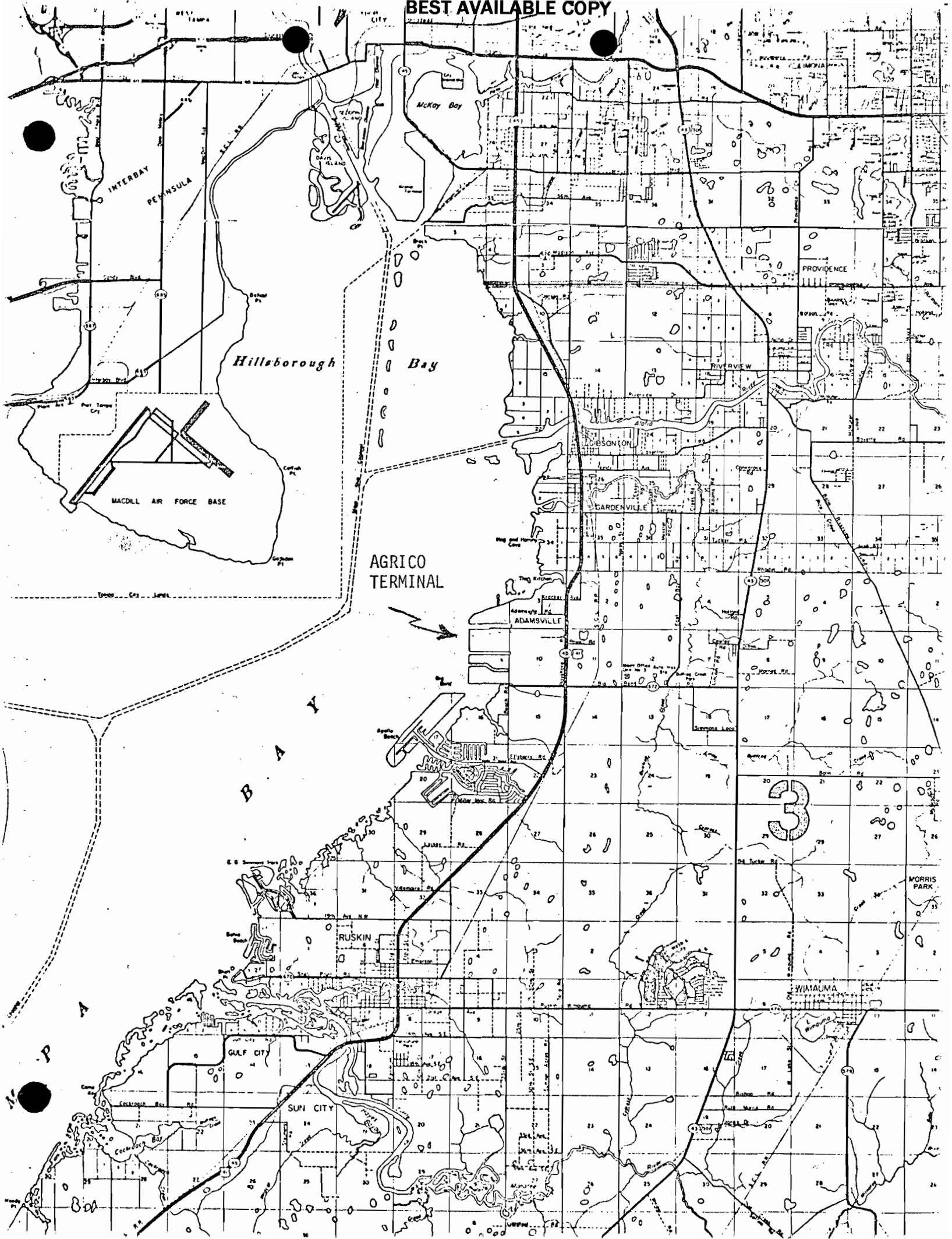
The maximum to minimum variation will be caused by the area of the sulfur storage area containing sulfur.

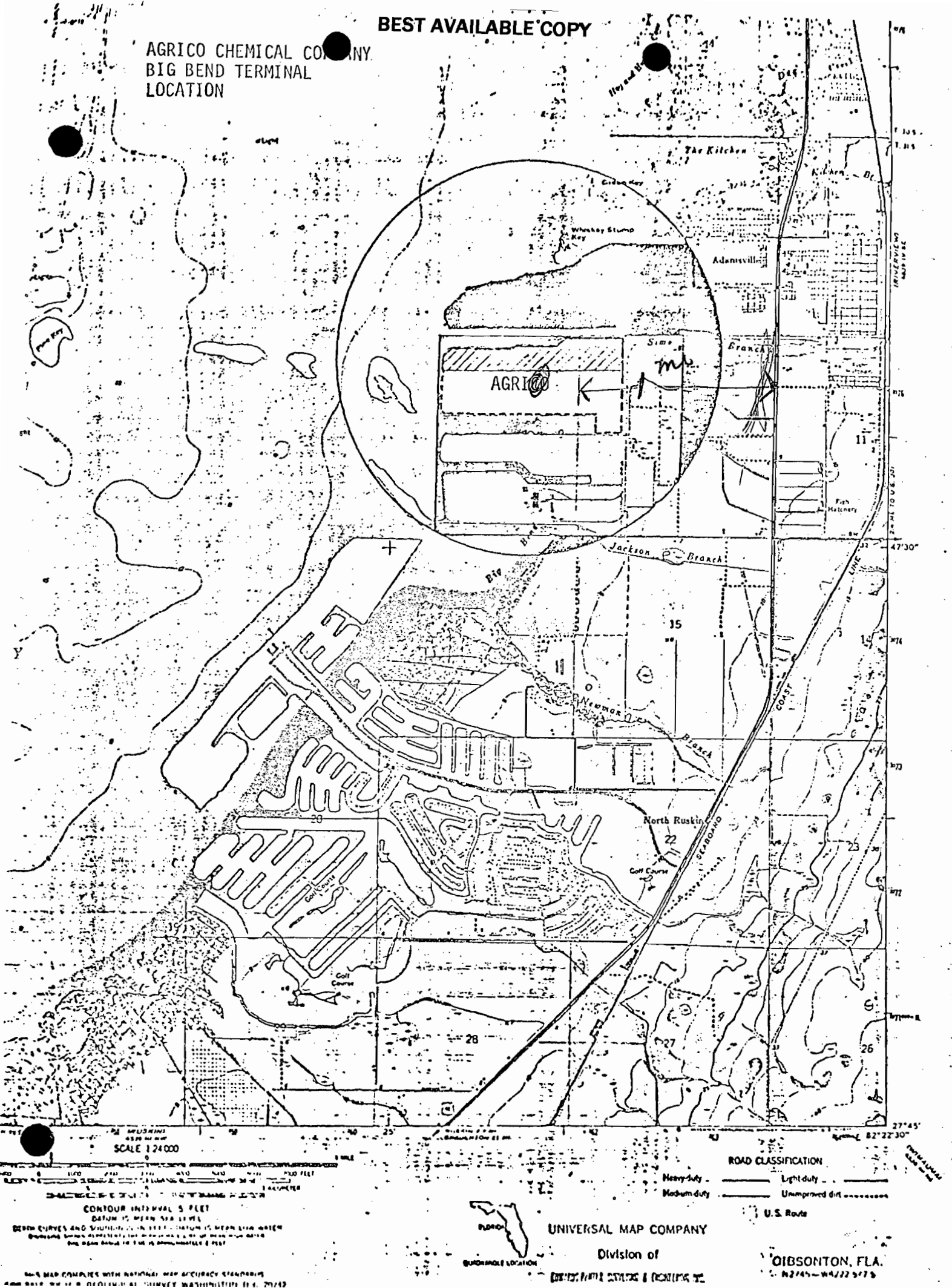
The periodic receiving of shipments and the steady reclaim from storage will keep the size of the storage pile constantly changing. The use of half the pile as average conditions will tend to balance the excess precipitation with no pile and the excess evaporation with a full pile. Increasing the volume of spray water on the pile will also tend to increase the amount of water lost to evaporation.

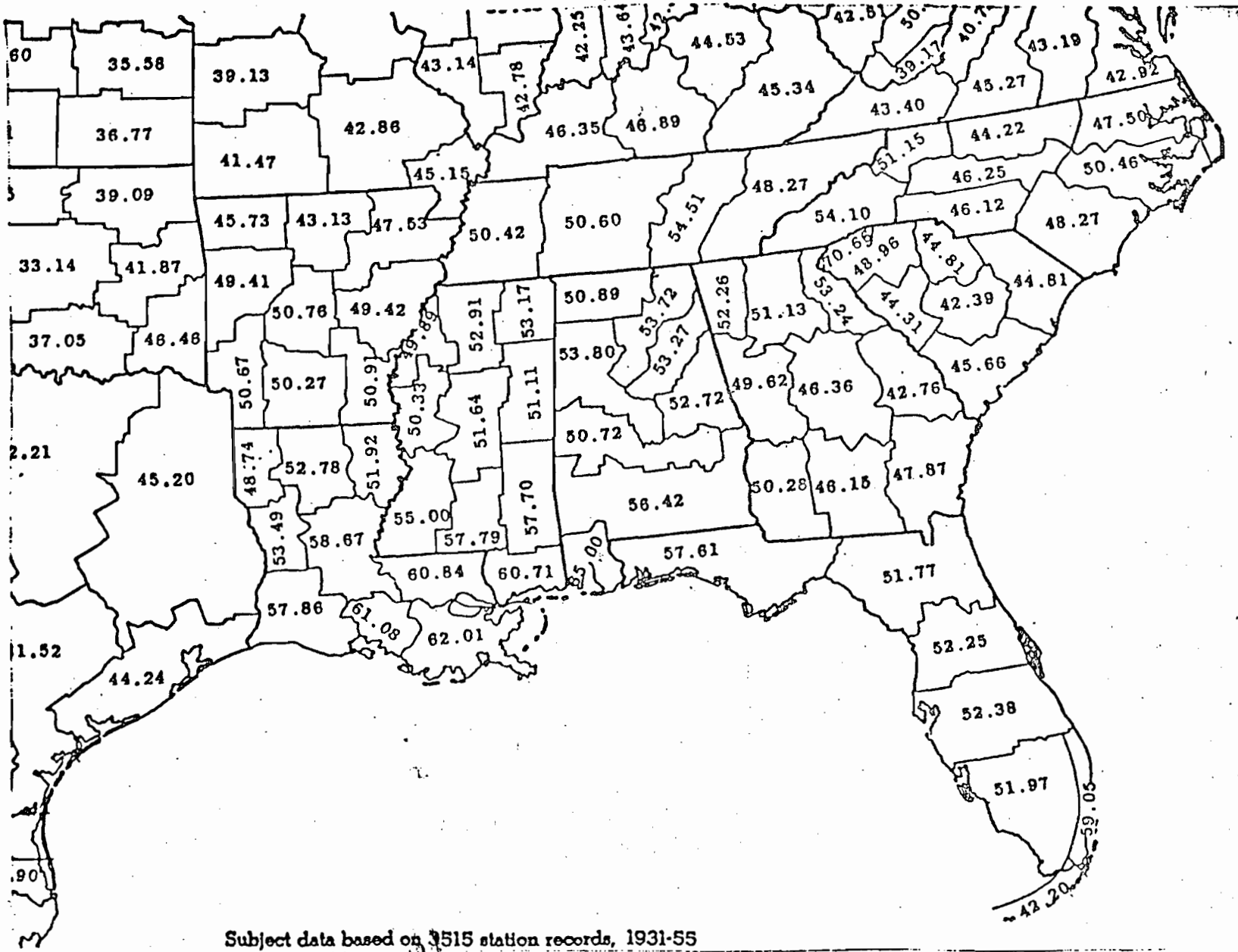
The lined storage pond and the holding pond are designed to accommodate the 24 hour - 10 year rainfall event (8-9 inches) and the 24 hour - 25 year rainfall event (9-10 inches).

Rainfall Data from Technical Paper No. 40 - Rainfall Frequency Atlas of the United States.

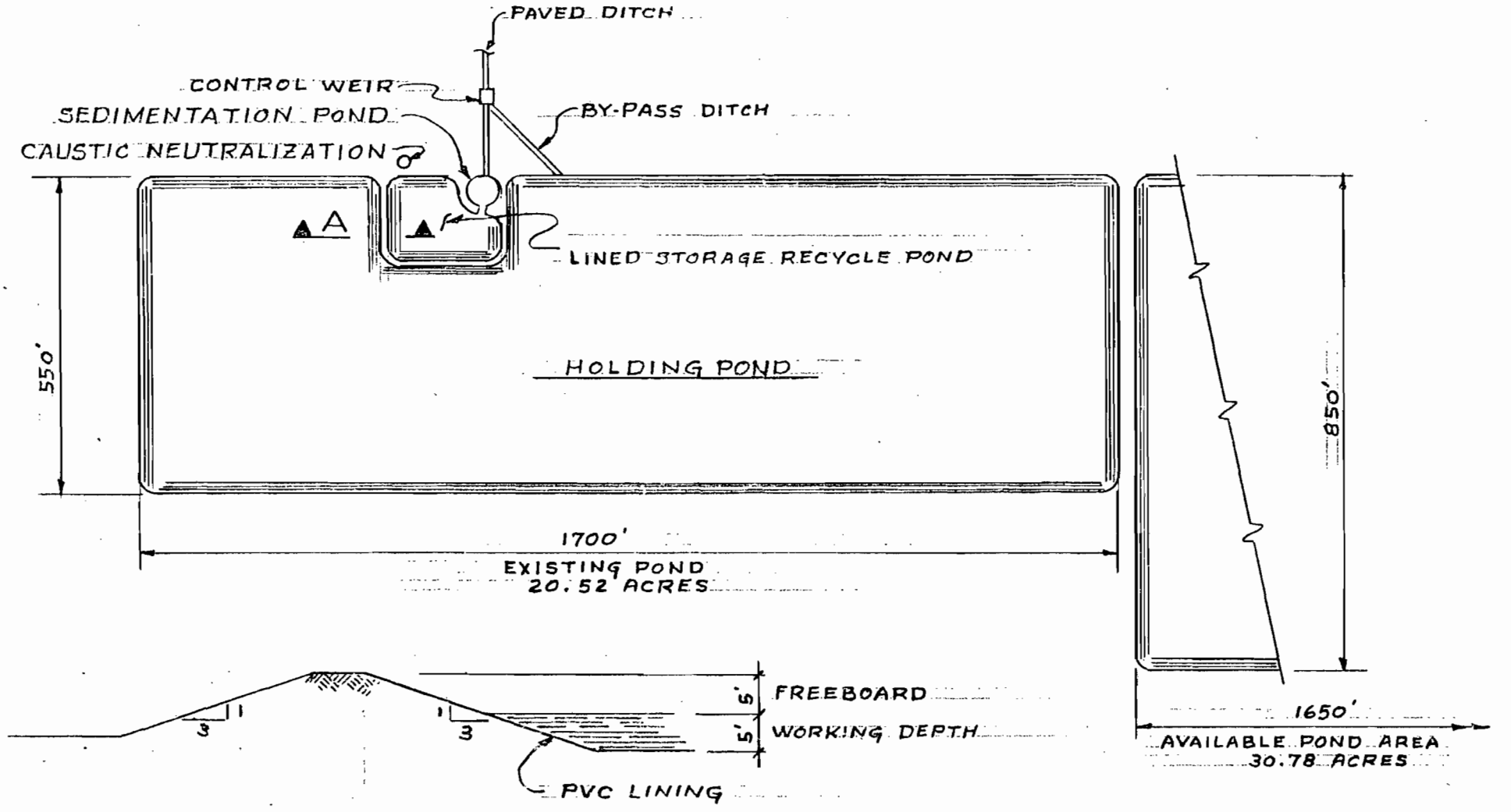








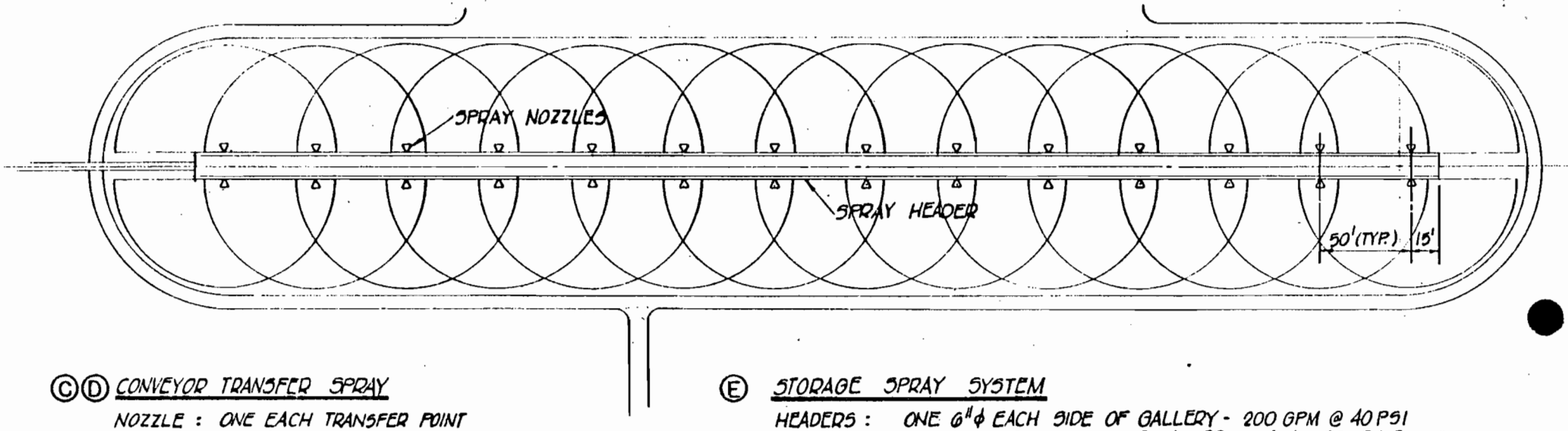
Subject data based on 3515 station records, 1931-55



SECTION A-A

AGRICO CHEMICAL CO.

BIG BEND SULFUR TERMINAL



Ⓒ Ⓓ CONVEYOR TRANSFER SPRAY

NOZZLE : ONE EACH TRANSFER POINT
SPRAYING SYSTEMS NO. 1-7N2
0.28 GPM @ 40 PSI

Ⓑ UNLOADING HOPPER SPRAY

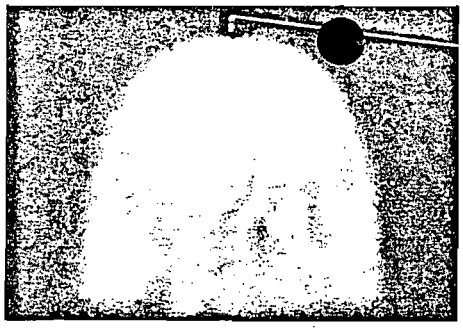
NOZZLE : FOUR EACH SIDE OF HOPPER
BETE FOG NOZZLE NO. FWL $\frac{3}{4}$ BOX
0.75 GPM @ 40 PSI

Ⓔ STORAGE SPRAY SYSTEM

HEADERS : ONE 6" ϕ EACH SIDE OF GALLERY - 200 GPM @ 40 PSI
NOZZLES : FOURTEEN EACH SIDE OF GALLERY - RAIN BIRD - TYPE 65 D,
RADIUS 58 FEET, 17.7 GPM CAPACITY

AGRICO CHEMICAL CO.

BIG BEND SULFUR TERMINAL



NOZZLES fog laying type

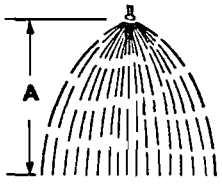
Spray Characteristics—Spray forms a fog-like mist with an overall full cone type pattern. Nozzle is designed for downward spray projection. Fog tends to hover over area covered by spray.

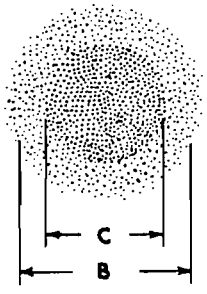
Construction — Nozzle consists of body and seven removable caps, each cap with internal vane. Caps and vanes easily removed for cleaning or replacement.

Materials — Nozzles made standard in brass and type 303 stainless steel. Other materials available on special order.

Recommended For—Fixed fire control installations. Also used in gas cooling and tank cooling applications.

Full Coverage Spray Pattern





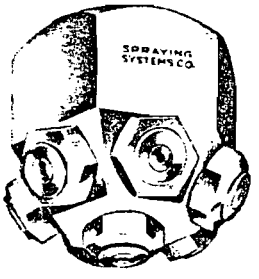
Coverage in the "C" zone represents about 65% of the total distribution density. The "B" zone represents the complete pattern coverage. About 35% of the total distribution occurs in the area beyond the "C" zone, with density gradually declining as the pattern edge is approached.

Type 7N low capacity Foglet Nozzles

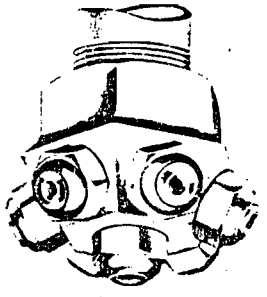
Nozzle No.	SPRAY PATTERN			CAPACITY GPM (gallons per minute) at p.s.i. (pounds per square inch)						
	A Feet	B Feet	C Feet	20 p.s.i.	40 p.s.i.	60 p.s.i.	80 p.s.i.	100 p.s.i.	125 p.s.i.	150 p.s.i.
1-7N2	3 & Up	4½	2½		.23	.29	.33	.37	.41	.45
1-7N3	3 & Up	5½	3½	.25	.35	.43	.50	.55	.62	.68
1-7N4	3 & Up	5½	3½	.33	.47	.57	.66	.74	.83	.90
1-7N6	3 & Up	6	4	.50	.70	.86	.98	1.1	1.2	1.4
1-7N8	3 & Up	6	4	.66	.93	1.1	1.3	1.5	1.7	1.8
1-7N10	3 & Up	7	4½	.83	1.2	1.4	1.7	1.8	2.1	2.3

Type 7G Foglet Nozzles

Nozzle No.	SPRAY PATTERN			CAPACITY GPM (gallons per minute) at p.s.i. (pounds per square inch)						
	A Feet	B Feet	C Feet	20 p.s.i.	40 p.s.i.	60 p.s.i.	80 p.s.i.	100 p.s.i.	125 p.s.i.	150 p.s.i.
¼-7G1	3 5 8 11	5 6½ 7½ 8	3¼ 4¼ 4¾ 5¼	.98	1.3	1.6	1.8	2.1	2.3	2.5
¼-7G3	3 5 8 11	8½ 10 11 11½	5½ 6½ 7 7½	2.9	4.0	4.8	5.5	6.2	6.8	7.4
¼-7G5	3 5 8 11	9½ 11 12 12½	6¼ 7 7¾ 8	4.8	6.7	8.1	9.2	10.3	11.3	12.4
1-7G10	3 5 8 11	7¼ 9½ 12 14	4¼ 6¼ 7¾ 9	9.8	13.5	16.4	18.9	21.0	23	25
1-7G25 1½-7G25	3 5 8 11	13¾ 16 17 17½	9 10½ 11 11½	24	34	41	47	52	57	62
1-7G32 1½-7G32	3 5 8 11	13¾ 16 17 17½	9 10½ 11 11½	31	43	52	59	66	74	79
1-7G40 1½-7G40	3 5 8 11	13¾ 16 17 17½	9 10½ 11 11½	39	53	64	74	83	92	100

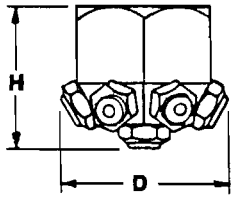


Type 7N
female connection



Type 7G
female connection
(mounted on pipe end)

DIMENSIONS AND WEIGHTS

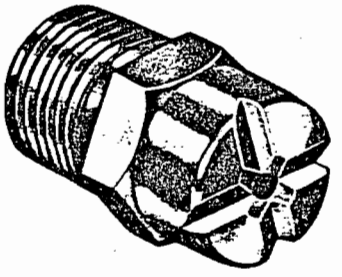


Nozzle No.	Pipe Conn.	H	D	Net Weight
1-7N2 1-7N3 1-7N4 1-7N6 1-7N8 1-7N10	1"	2 1/32"	2½"	1½ lbs.
¼-7G1 ¼-7G3 ¼-7G5	¼"	1 11/16" 1 11/16" 1 13/16"	1⅞" 1⅞" 2 1/32"	1 lb.
1-7G10 1-7G25 1-7G32 1-7G40	1"	2 3/16" 3 9/32" 3 9/32" 3 9/32"	2 11/16" 4⅛" 4⅛" 4⅛"	1½ lbs. 3½ lbs. 3½ lbs. 3½ lbs.
1½-7G25 1½-7G32 1½-7G40	1½"	3⅛" 3⅛" 3⅛"	4" 4" 4"	3½ lbs. 3½ lbs. 3½ lbs.

See page 64 for spray coverage and pipe friction information.

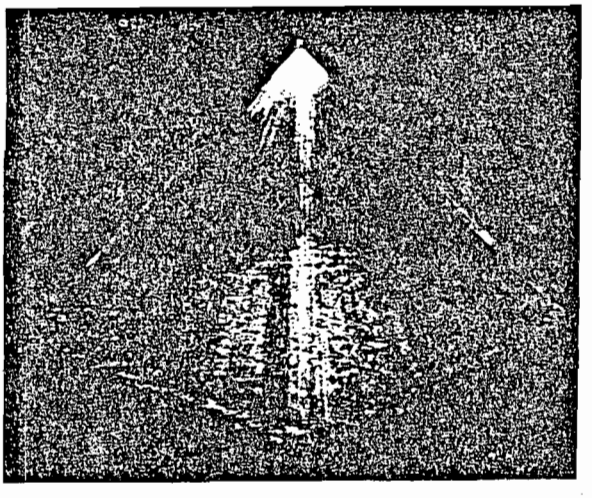
SQUARE

These square pattern nozzles deliver a squared off pattern with full coverage within the square. The spray angle is approximately 80° on the flats. Atomization, free passage and general performance are similar to the full cone nozzles.



The square pattern is recommended where a single nozzle must cover a square area or two or three nozzles must cover a rectangular area. For larger areas a group of full cone nozzles will give equally good coverage at less cost.

The WL nozzles are available in brass, stainless steel Type 303, Teflon and PVC plastic. Special materials frequently used are stainless steel Type 316, low carbon steel, monel and hard rubber.



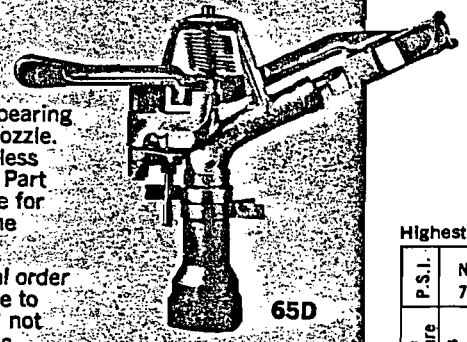
80° square

Pipe Size	Female	Male	Hex Size	Length O.A.	Weight Ounces Metal	Plastic	GALLONS PER MINUTE @ PSI 5	10	20	30	40	60	80	100	150	200	400
1/8	FWL⅛80X	WL⅛80X	7/16	7/8	1	1/4		.12	.18	.22	.25	.30	.35	.40	.48	.55	.80
	FWL¼80X	WL¼80X	7/16	7/8	1	1/4		.25	.35	.43	.50	.61	.71	.80	.95	1.10	1.60
	FWL⅜80X	WL⅜80X	7/16	7/8	1	1/4		.37	.52	.64	.75	.91	1.10	1.20	1.40	1.60	2.40
1/4	FWL180X	WL180X	9/16	1	1-1/2	3/8	.35	.50	.71	.86	1.00	1.20	1.40	1.60	1.90	2.20	3.20
	FWL1¼80X	WL1¼80X	9/16	1	1-1/2	3/8	.53	.75	1.10	1.30	1.50	1.80	2.10	2.40	2.90	3.40	4.70
3/8	FWL280X	WL280X	11/16	1-1/4	2	1/2	.71	1.00	1.40	1.70	2.00	2.50	2.80	3.20	3.90	4.50	6.30
	FWL380X	WL380X	11/16	1-1/4	2	1/2	1.10	1.50	2.10	2.60	3.00	3.70	4.20	4.70	5.80	6.70	9.50
	FWL480X	WL480X	11/16	1-1/4	2	1/2	1.40	2.00	2.80	3.50	4.00	4.90	5.70	6.30	7.70	9.00	12.60
1/2	FWL580X	WL580X	7/8	1-1/2	3	1	1.80	2.50	3.50	4.30	5.00	6.10	7.10	7.90	9.70	11.20	15.80
	FWL680X	WL680X	7/8	1-1/2	3	1	2.10	3.00	4.20	5.20	6.00	7.30	8.50	9.50	11.60	13.40	19.00
	FWL780X	WL780X	7/8	1-1/2	3	1	2.50	3.50	4.90	6.10	7.00	8.60	9.90	11.10	13.50	15.70	22.20
3/4	FWL880X	WL880X	1-1/8	2	6	1-1/2	2.80	4.00	5.70	6.90	8.00	9.80	11.30	12.60	15.40	17.90	25.20
	FWL1080X	WL1080X	1-1/8	2	6	1-1/2	3.50	5.00	7.10	8.60	10.00	12.20	14.10	15.80	19.40	22.30	31.60
	FWL1280X	WL1280X	1-1/8	2	6	1-1/2	4.20	6.00	8.50	10.40	12.00	14.70	17.00	19.00	23.20	26.80	37.90
1	FWL1580X	WL1580X	1-3/8	2-3/16	14	3-1/2	5.30	7.50	10.60	13.00	15.00	18.40	21.20	23.70	29.00	33.50	47.40
	FWL2080X	WL2080X	1-3/8	2-3/16	14	3-1/2	7.10	10.00	14.10	17.30	20.00	24.50	28.30	31.60	38.70	44.30	63.30

RAIN BIRD

PART CIRCLE SPRINKLERS

65D SERIES



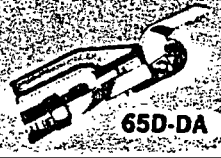
1" female Standard bearing only. Cast bronze body, arm, trips and bearing sleeve. Brass bearing nipple and straight bore range nozzle. Silicon bronze arm spring. Stainless steel trip spring and trip collars. Part circle sprinkler. Easily adjustable for full circle operation by sliding the slip pin up. No tools needed.

TNT bearings available on special order for use on all but DA models. Due to diffuser wire, the DA nozzle will not fit in 65D series sprinklers unless ordered from factory as DA models.

65D

Similar to the 65D above except has adjustable pin nozzle for control of stream break-up.

65D-ADJ



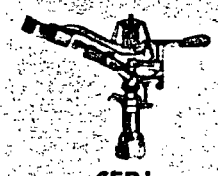
Similar to the 65D above except has Distance Control nozzle to allow adjustment of radius down to 30 feet.

65D-DA

Highest point of stream is 10' above nozzle.*

P.S.I.	Nozzle 7/32"		†Nozzle 1/4"		Nozzle 9/32"		Nozzle 5/16"		Nozzle 11/32"		Nozzle 3/8"	
Nozzle Pressure	Radius (Feet)	Discharge GPM	Radius (Feet)	Discharge GPM	Radius (Feet)	Discharge GPM	Radius (Feet)	Discharge GPM	Radius (Feet)	Discharge GPM	Radius (Feet)	Discharge GPM
40	51	8.8	54	11.5	57	14.6	59	17.7	60	21.1	62	24.4
45	53	9.4	55	12.2	58	15.5	61	18.9	63	22.5	65	26.0
50	55	9.9	57	12.9	60	16.3	63	20.0	65	23.8	67	27.5
55	56	10.4	57	13.6	62	17.2	65	21.0	67	25.0	70	29.1
60	58	10.9	58	14.2	65	18.0	67	22.0	69	26.2	73	30.6
65	59	11.4	62	14.8	67	18.8	69	23.0	70	27.4	74	32.0
70	60	11.8	63	15.4	70	19.5	71	23.9	72	28.5	75	33.2
75	62	12.2	64	16.0	71	20.3	73	24.8	74	29.6	76	34.5
80	63	12.6	65	16.5	72	20.9	75	25.7	76	30.6	77	35.7

65PJ SERIES



65PJ

Similar to the 65D above except has a Precision-Jet arm. Arm is cast bronze with a brass tube. The Precision-Jet arm eliminates side splash.

65PJ-ADJ

Similar to the 65D-ADJ above except has a Precision-Jet arm.

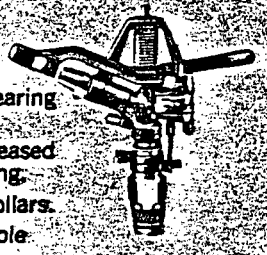
65PJ-DA

Similar to the 65D-DA above except has a Precision-Jet arm.

Highest point of stream is 10' above nozzle.*

P.S.I.	Nozzle 7/32"		†Nozzle 1/4"		Nozzle 9/32"		Nozzle 5/16"		Nozzle 11/32"		Nozzle 3/8"	
Nozzle Pressure	Radius (Feet)	Discharge GPM	Radius (Feet)	Discharge GPM	Radius (Feet)	Discharge GPM	Radius (Feet)	Discharge GPM	Radius (Feet)	Discharge GPM	Radius (Feet)	Discharge GPM
40	51	8.8	54	11.5	57	14.6	59	17.7	60	21.1	62	24.4
45	53	9.4	55	12.2	58	15.5	61	18.9	63	22.5	65	26.0
50	55	9.9	57	12.9	60	16.3	63	20.0	65	23.8	67	27.5
55	56	10.4	57	13.6	62	17.2	65	21.0	67	25.0	70	29.1
60	58	10.9	58	14.2	65	18.0	67	22.0	69	26.2	73	30.6
65	59	11.4	62	14.8	67	18.8	69	23.0	70	27.4	74	32.0
70	60	11.8	63	15.4	70	19.5	71	23.9	72	28.5	75	33.2
75	62	12.2	64	16.0	71	20.3	73	24.8	74	29.6	76	34.5
80	63	12.6	65	16.5	72	20.9	75	25.7	76	30.6	77	35.7

85E-TNT



1¼" male TNT bearing only. Cast bronze body arm and trips. Brass bearing sleeve, nipple, and nozzles.

NEW non-clog plastic vane for increased diameters. Silicon bronze arm spring.

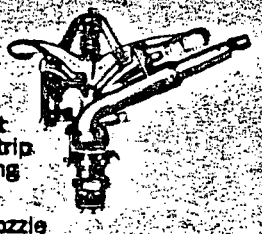
Stainless steel trip spring and trip collars.

Part circle sprinkler. Easily adjustable for full circle by sliding slip pin up. No tools needed.

P.S.I.	Nozzle 11/32" x 7/32"-20°		†Nozzle 3/8" x 7/32"-20°		Nozzle 13/32" x 7/32"-20°		Nozzle 7/16" x 7/32"-20°		Nozzle 15/32" x 7/32"-20°		Nozzle 1/2" x 1/4"		Nozzle 17/32" x 1/4"		Nozzle 9/16" x 1/4"		Nozzle 5/8" x 1/4"	
P.	Rad.	GPM	Rad.	GPM	Rad.	GPM	Rad.	GPM	Rad.	GPM	Rad.	GPM	Rad.	GPM	Rad.	GPM	Rad.	GPM
50	79	33.2	77	37.7	80	42.1	83	46.8	86	51.9	88	61.0	92	65.8	96	73.1	100	86.2
55	77	34.9	79	39.7	82	44.3	85	49.1	88	54.7	91	63.9	94	69.2	98	76.8	102	90.9
60	79	38.5	81	41.4	84	46.6	87	51.5	90	57.2	93	67.0	96	72.5	100	80.5	104	94.7
65	81	38.0	83	43.2	86	48.6	89	53.8	91	59.8	95	70.0	98	75.8	101	84.1	105	99.2
70	82	40.1	84	44.9	88	50.4	91	55.9	93	62.1	96	72.8	100	78.5	103	87.4	107	103.0
75	84	41.0	86	46.7	89	52.4	92	57.9	94	64.3	98	75.4	101	81.8	105	90.7	108	107.0
80	86	42.6	87	48.3	90	54.3	93	60.0	96	66.7	99	78.0	103	84.5	106	93.8	110	110.0
85	88	43.8	89	48.8	92	56.0	95	62.0	97	68.8	101	80.5	104	86.7	108	96.9	111	114.0
90	88	45.7	90	51.4	93	57.9	96	63.9	98	70.7	102	82.8	106	90.0	109	99.5	113	117.0
95	89	46.6	91	53.0	94	59.8	97	65.8	100	72.8	103	85.0	107	92.5	110	102.0	114	121.0
100	90	47.9	92	54.6	95	61.2	98	67.5	101	74.8	104	87.2	108	94.6	111	105.0	115	124.0

Also available as a 85EW-TNT, same as 85E-TNT except has brass plug instead of spreader nozzle for lower precipitation rates.

95E-TNT



2" male TNT bearing only. Aluminum body and arm. Both have stainless steel striker plugs. Arm has a brass bushing and stainless steel trip striker plate. Anodized aluminum range tube with stainless steel vane. Cast bronze bearing sleeve, nipple, trips and trip collars. Stainless steel arm spring, bearing spring, and trip spring.

Brass straight bore range nozzle, drive nozzle and special spreader nozzle with a fixed stainless steel pin. Part circle sprinkler. Easily adjustable for full circle operation by sliding the slip pin up. No tools needed.

P.S.I.	Nozzle 1/2" x 5/16"x1/4"		Nozzle 9/16"x 5/16"x1/4"		†Nozzle 5/8"x 3/8"x5/16"		Nozzle 11/16"x 3/8"x5/16"		Nozzle 3/4"x 3/8"x11/32"	
	Rad.	GPM	Rad.	GPM	Rad.	GPM	Rad.	GPM	Rad.	GPM
60	97	94.1	102	110.0	107	144.2	112	158.9	117	180.0
65	98	97.9	103	114.2	108	149.7	113	165.0	118	186.0
70	99	101.8	104	118.9	109	154.9	114	171.0	119	192.0
75	100	105.1	105	122.2	110	158.9	115	176.3	121	197.0
80	101	108.8	106	126.0	111	162.2	116	180.8	123	200.5
85	102	111.8	107	129.8	112	167.9	118	185.2	125	206.0
90	103	114.7	108	132.9	113	172.1	120	189.7	128	211.5
95	104	117.8	109	135.7	115	176.3	123	193.2	131	216.0
100	105	120.8	110	138.8	117	181.2	126	199.3	135	220.0

**Shown for standard nozzle at normal operating pressure.*

†Indicates standard nozzle size.

Black face in chart indicates minimum recommended working pressures for best distribution.

SHADED AREAS IN CHARTS INDICATE ONLY AVAILABLE WITH TNT BEARING.

(105 Part Circle—see Rain Guns, Page 43.)

MEMORANDUM OF INTENT

THIS MEMORANDUM OF INTENT is jointly written this Third day of August, 1977, by and between P. V. CONTAINER SYSTEMS LTD., an Alberta corporation, and a partially owned subsidiary of Pan Ocean Oil Ltd. (hereinafter referred to as "Seller"), and AGRICO CHEMICAL COMPANY, a Delaware corporation, and a subsidiary of The Williams Companies (hereinafter referred to as "Buyer").

As a result of discussions to date between Seller and Buyer, it appears that it would be beneficial to both parties to continue negotiations concerning and to consider entering into a Sulphur Supply Contract which would be patterned upon the following terms and conditions of sale:

1. Seller will supply Buyer with dry bulk sulphur in nugget form as presently produced by Seller's nuggetizer at its Strachan plant, but it is understood that this initial form of nuggetized sulphur may be varied by mutual agreement of the parties from time to time throughout the contract period in an effort to upgrade the form of the product. Seller's nuggetized sulphur will meet Buyer's specifications with respect to:

   (a) Product size;

   (b) Product density and handling characteristics; and

   (c) Product durability as it relates to degradation through handling.

2. The term of the contemplated Sulphur Supply Contract will be for an initial period of

P. V. CONTAINER SYSTEMS LTD.

P. V. Container Systems Ltd. first became interested in sulphur early in 1975, with the initial emphasis on transportation. There were numerous plant locations which did not lend themselves to economical sulphur production distribution with the then current systems.

The environmental aspects were confining and compounded because many of the plant locations were in heavily wooded and green forest preserves - some parks, some preserved wilderness areas.

With the introduction of an enclosed container and a new method of forming sulphur, the "nugget", the transportation problems were overcome early in the summer of 1976. The nuggetized product was firmly established and tested by experimental shipments using both closed and open transportation.

The economics of this combination have been successfully established and the environmental soundness of this nugget has been proven with its acceptance by regulatory bodies in Canada.

PRODUCT FORMS AND CHARACTERISTICS

Crushed bulk sulphur as its name implies is obtained by crushing sulphur recovered from block stockpiles. The recovery, crushing, handling and transportation create large amounts of dust which are unacceptable in environmentally sensitive areas. The dry dust also presents an explosion and fire hazard.

Slate sulphur, as presently produced for certain members of the Canadian Sulphur Industry was thoroughly investigated by P. V. Container Systems Ltd. on behalf of Pan Ocean Oil Ltd., with a view to its suitability to their sulphur shipping programme. The slate is formed by passing liquid sulphur on rubber or steel conveyor belts either through or over a water tank. The moisture content in slate does vary widely and our findings indicate that the fines created during handling and stockpiling may create an environmentally unacceptable level of airborne dust depending on the established local regulations.

P. V. Container Systems Ltd. recognized that the dusting problem, or what is very important "the airborne movement of fines", can be estimated by evaluating the amount of product, as fines, which exists at particular stages in the production, transportation and handling of the product. If we define the portion of the product which passes a 50 mesh sieve or screen as the fines which could result in dust, then the percentage of the product which is of this size gives an indication of the dusting potential of the product. For example, for a product containing 8 to 10 percent of minus 50 mesh fines, dusting is currently being controlled by maintaining a moisture content of at least 1.5 percent. It is believed that a product containing in excess of 5 percent of minus 50 mesh fines would cause dust problems if the product moisture content were less than 0.5 percent.

After thorough investigation and experimentation over approximately two years with various potential new forms of sulphur recognizing the environmental regulations to be met during the production and handling process from Alberta to final destination, - P. V. Container Systems Ltd. established a machine in Alberta capable of producing sulphur in "nugget" form.

This nugget is almost spherically shaped, is basically free flowing and when stockpiled has an angle of repose of approximately 32^{o}. Because of this property, gravity reclaim from stockpiles is very effective due to the reduced tendency for bridging or hang-up of the product. The nugget handles easily on conveyors, in chutes or over feeders. The quality of the sulphur is unchanged by the process, maintaining its 99.5 percent plus purity which is characteristic of Canadian Bright Sulphur.

Test results indicate that the current P. V. Container Systems Ltd.'s production will have a minus 50 mesh fines content of approximately 0.4 percent, as produced and approximately 5.6 percent when stockpiled assuming rail shipment, sea shipment and then into storage at destination.

Dusting is virtually eliminated with the P. V. Container Systems Ltd. nugget and previous shipments have demonstrated that such fines as are present, are in the form of chips which do not become airborne.

EFFECTS OF SULPHUR ON HUMANS AND ANIMALS

If sulphur dust enters the eyes it will cause them to water for a short time but does not have any lasting effect nor does it cause any damage. The eyes can be easily protected by wearing goggles. Sulphur dust is not known to have any ill effects on humans and the Worker's Compensation Board in Canada have no objection to men working full time in sulphur dusty conditions provided the correct safety procedures are adopted and enforced.

Animals, domestic and domesticated, do not appear to be affected by sulphur. This conclusion is drawn from observing their behaviour around sulphur stocks on our property where breeding cattle have grazed for four years beside heaps of sulphur and have shown no discomfort or ill effects. Veterinarian's have also confirmed that sulphur has no known ill effect on animals.

Sulphur does not have any odor peculiar to itself, but produced sulphur in the liquid form may contain hydrogen sulphide. This odor is eliminated at the production end of the system by degasification of the liquid and is not considered to be of any concern as it might relate to the formed product (nugget).

EFFECTS ON SULPHUR OF RAIN WATER OR SEA WATER

Contact with rain water would temporarily increase the surface moisture content of some areas of a stockpile. The extent of the temporary increase would depend upon the configuration of the stockpile and upon the drainage pattern within the stockpile. These tests have shown that rain on a stockpile either drains through the outside layer of the stockpile, or drains in channels within the stockpile and does not percolate evenly throughout the stockpile. The drainage pattern is affected by the shape, size and size distribution in the pile.

A small (minus 2 mm) regular shaped product appears to be more prone to disseminated drainage within the stockpile than does a less regular shaped product. Because of the raincoat effect created on the surface of the stockpile, rainfall does not appreciably increase the moisture content.

We are advised by sulphur buyers that excessive moisture in sulphur is undesirable owing to some possible complications within their process, but to our knowledge it has no deleterious effect on the sulphur itself. Naturally we would wish to maintain tight controls on moisture application owing to the increased costs within the transportation system.

It is our understanding that sea water contact with sulphur would be undesirable owing to the possible presence of chlorine being retained in the sulphur, which we are advised has a tendency to expedite the deterioration of the catalysts employed in the end-users process. However, we believe that the amount of sea water retained would have to be considerable as a percentage of the total tonnage in any shipment.

The sea water would not cause any chemical reaction with the sulphur nor the sulphur with the sea water in the unprocessed state. Sulphur is not soluble in water.

There is very little possibility of sea water finding access to the sulphur other than through carelessness or an accident aboard the deep sea vessel.

FORMED COMPARED TO LIQUID

The question of the desirability of using a dry or formed product rather than a liquid product is basically one of economics, which is in itself one of location and accessibility of the producing plant.

The possibility of moving liquid sulphur in large quantities is restricted. The rail facilities required are not available at producing plants. The rail cars are not available for continued movement, storage facilities at producing sites, terminal and transfer points are not available and these storage requirements would require a great deal of capital investment. In addition to the foregoing,

the specialized deep sea vessels required for transporting and maintaining liquid sulphur are expensive to build and only capable of a one way haul.

We understand that Frasch sulphur was previously delivered into Florida in crushed dry bulk form and our views on crushed sulphur versus nuggets are adequately expressed earlier in this report on pages 1 and 2.

SUMMARY

P. V. Container Systems Ltd. as the processing, transportation and marketing arm of Pan Ocean Oil Ltd. were assigned the task of analyzing the various forms of sulphur giving full recognition to the economic, handling and environmental aspects and they believe that their present form of "nugget" satisfies all these criteria. The present form of nugget will be improved upon over the forthcoming years, but there is no doubt that the "nugget" presently being produced is durable, non-dusty, easy to handle and economical to produce and in their opinion ideally suited to the Florida environmental requirements.

R.M.HARDY & ASSOCIATES LTD.
CONSULTING ENGINEERING & PROFESSIONAL SERVICES
• MATERIALS ENGINEERING & SCIENCE DIVISION

File No. N5195

File

August 31, 1977

P.V. Container Systems Ltd.,
1050 - 355 - 4th Avenue South West,
Calgary, Alberta
T2P 0J1

Attention: Mr. John Squarek

Dear Sir:

The following is a summary of the test work performed on the sulphur sample received August 25, 1977.

METHOD

Approximately 10 lbs of the wet sulphur sample was received August 25, 1977. While the sample was still sealed inside a plastic bag it was mixed gently and thoroughly. After mixing, the sample was poured onto a polypropylene sheet and duplicate samples of approximately 30 grams each were taken for Karl Fischer moisture determinations. The results of these moisture determinations can be found in Table No. 1.

The bulk sample was then coned and quartered into several portions close to 250 grams each. These samples were air dried for a period of 24 hours, oven dried to constant weight at 50°C and weighed to the nearest 0.1 grams.

One 250 gm sample was then washed over a #50 (US) sieve, air dried for 24 hours, oven dried to constant weight and sieved on the 3/8", #4, #8, #16 and #50 (US) sieves for 3 minutes using a Cenco vibratory shaker.

...2

Two of the samples were subjected to 450 revolutions in the Stress Level I Friability tumblers at 19 rpm. The recovered sample was weighed, washed over a #50 (US) sieve, air dried for approximately 24 hours, oven dried to constant weight and sieved on the 3/8", #4, #8, #16 and #50 (US) sieve. The results of both the original sieve size and the Stress Level I Friabilities can be found in Table No. 2.

Further to this three samples approximately 500 grams in size were taken from the bulk sample using the cone and quartering method and oven dried to constant weight @ 50°C. Two of these samples were run separately in the Stress Level II Friability tumbler for 40 revolutions. The recovered sample was accurately weighed and washed over a #50 (US) sieve, air dried for approximately 24 hours, oven dried to constant weight at 50°C and sieved on the 3/8", #4, #8, #16 and #50 (US) sieves. The results of this test can also be found in Table No. 2.

The remaining 500 gram sample was hand sieved on the above-mentioned sieves and 200 pieces from each sieve size were accurately weighed. The average mass was then calculated summing the product of the individual size mass times the percentage of that size. (Note: The minus #50 (US) material was neglected, since it is difficult to isolate and weigh. Therefore the percent retained was adjusted basing it on the 3/8", #4, #8, #16 and #50 sizes only.) These figures are listed in Table No. 3. The resulting calculated mass was plotted against the Stress Level I fines production. Its position relative to that of other Sulphur forms can be seen on Graph No. 1.

As discussed in our telephone conversation of August 29, 1977, we would be happy to perform the Friability tests on various isolated sizes of your product. We look forward to hearing from you in the near future.

Respectfully submitted,

R.M. HARDY & ASSOCIATES LTD.

Per: Don Frame

D. Frame, C.E.T.

DF:jw

Attachments

TABLE NO. 1

KARL FISCHER MOISTURES

Sample	Moisture	
	% Surface	% Total
A	2.62	3.44
B	2.72	3.56
Average ($\bar{x}$)	2.67	3.50

TABLE NO. 2

PERCENT RETAINED

Sieve Size (US)	Sample as Received	Stress Level I Sample			Stress Level II Sample		
		1	2	$\bar{X}$	1	2	$\bar{X}$
3/8"	0.5	-	-	-	-	-	-
#4 — 4.7 mm	47.3	22.5	18.6	20.6	0.4	0.2	0.3
#8 — 2.4 mm	49.4	48.3	50.5	49.4	33.1	29.6	31.4
#16 — 1.2 mm, 1.3 mm — 300 u	2.0	18.6	19.5	19.0	48.0	52.0	50.0
#50	0.4	4.9	5.8	5.4	12.4	12.6	12.5
Passing #50 (fines)	0.4	5.7	5.6	5.6	6.1	5.6	5.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

100 : 150 — 150 um

200 : .074 mm — 74 um

1000.0 / 1000.0

TABLE NO. 3

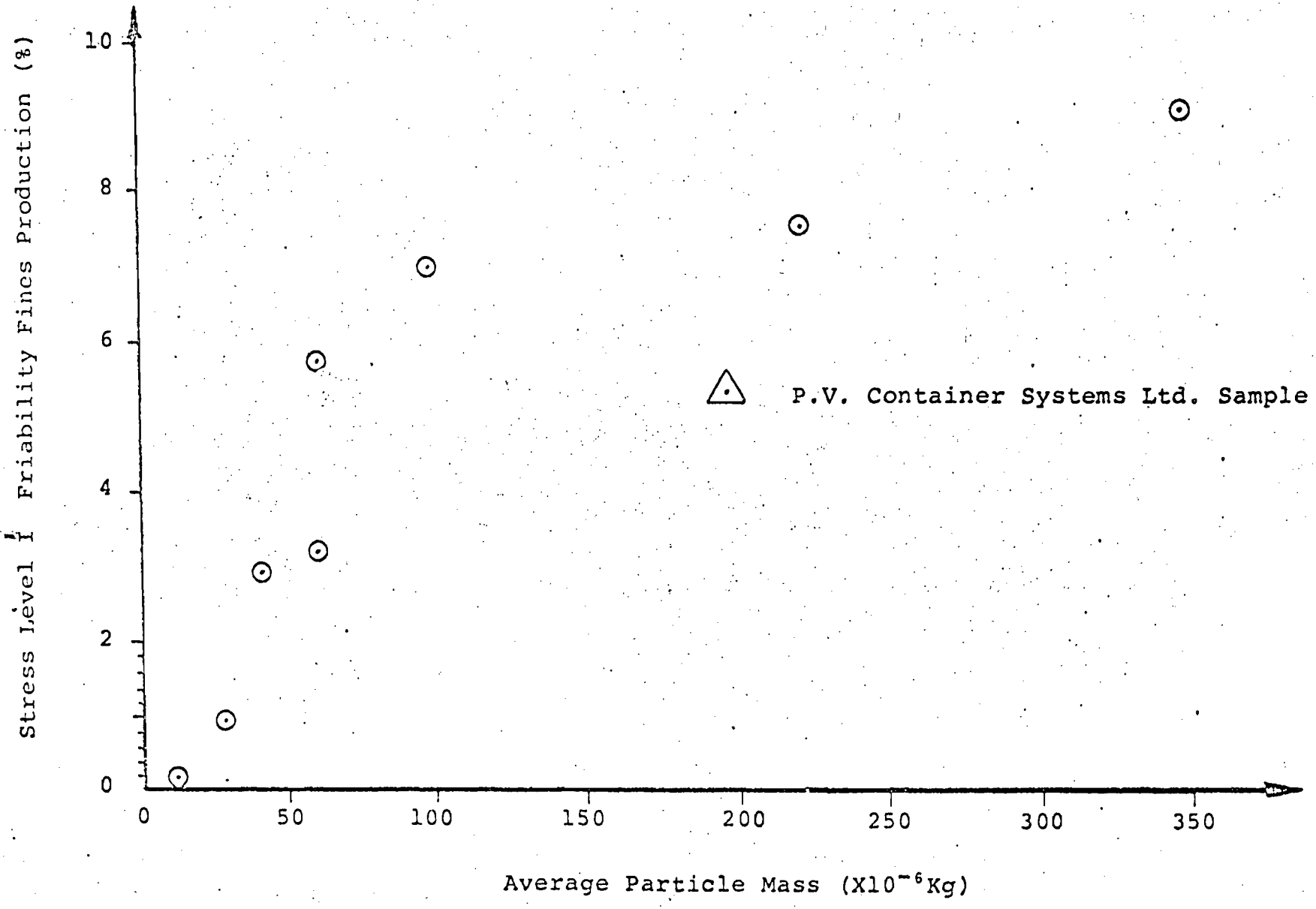
Sieve Size	% Retained	Adjusted % Retained	Weight per Particle (gms)	Adjusted % Ret. X Wt. per Particle (gms)
3/8"	0.5	0.5	0.91	0.005
#4	47.3	47.5	0.30	0.143
#8	49.4	49.6	0.09	0.045
#16	2.0	2.0	0.01	0.0002
#50	0.4	0.4	(0.00)	-
Passing #50 (fines)	0.4	-	-	-
Total	100.0	100.0		0.1932* = 193.2 x 10^{-6} Kg

* This is the weighted average of the particle sizes.

hand picked sizes above 50 mesh

GRAPH NO. 1

Average Sulphur Particle Mass vs Fines Production



CORE LABORATORIES-CANADA LTD.
CALGARY ALBERTA

COMPANY	P V Container Systems Ltd.	PAGE	1 of 1
	Production Drainage Water from Pile Water	FILE	7061-7374

DATE SAMPLED August 9, 1977 @ 10:45 PM

Analysis

pH	6.34
Acid Number	20.0 mg $CaCO_3$/liter
Suspended Solids	50.5 mg/liter
Analysis of Suspended Solids:	
Sulphur (CS_2 Wash)	95.0 %
Loss on Ignition @ 600°C	1.6 %
Acid Insolubles	3.3 %
Acid Solubles	0.1 %

SIZE ANALYSIS

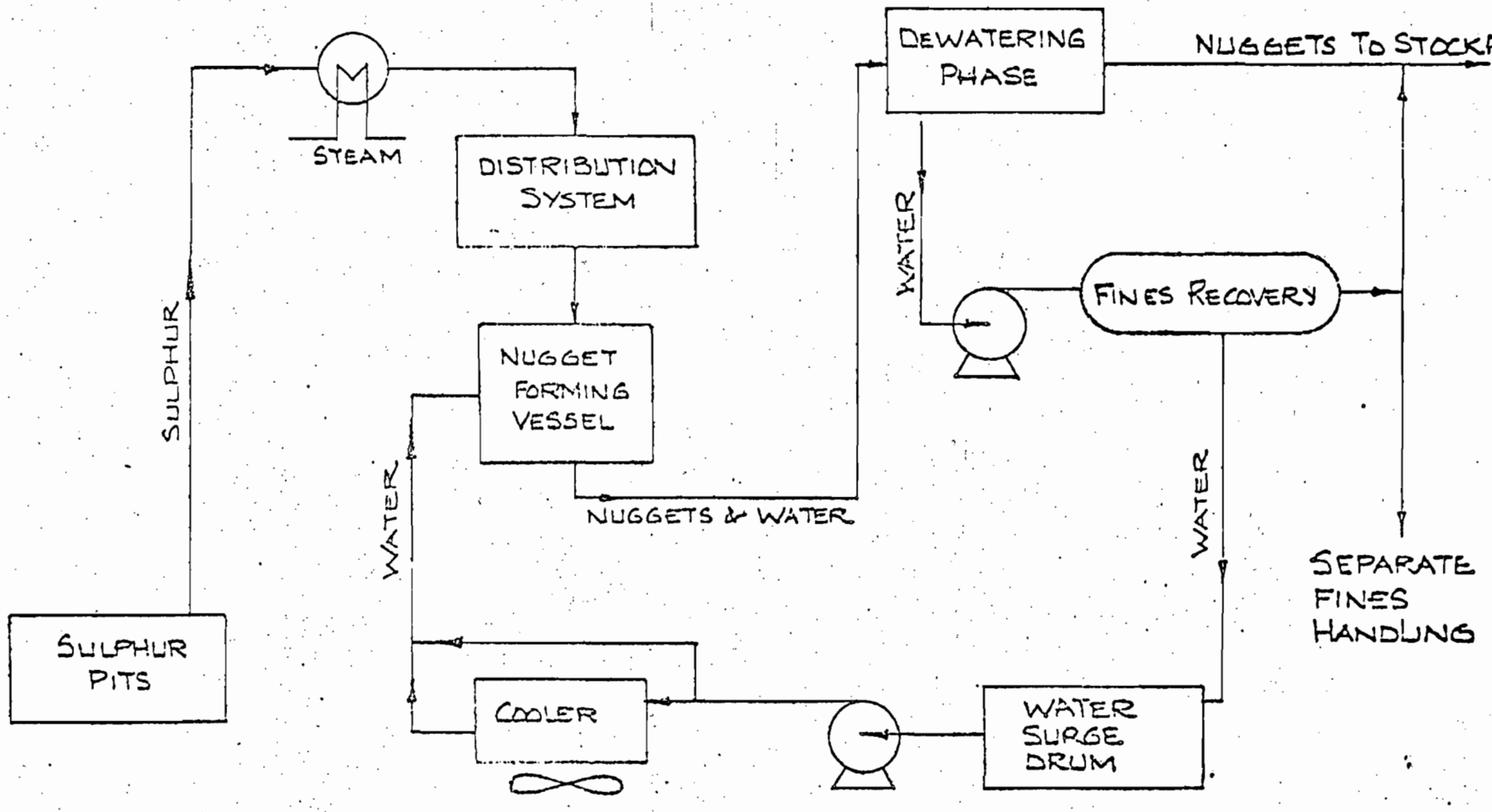
Sample: August 19, 1977

Tyler Mesh	Operture	Wt. g.	%
+4	4.750 mm	6209.85	57.82
4x5	4.000 mm	2138.90	19.92
5x9	2.000 mm	2298.80	21.40
9x16	1.000 mm	69.75	0.63
16x32	0.500 mm	12.10	0.11
32x60	0.250 mm	6.75	0.06
60x0	-	6.75	0.06
			100.00

NORMAL FRIABILITY

% FINES (-50 mesh)

PRODUCT	AS RECEIVED	STRESS LEVEL #1	STRESS LEVEL #2	FIELD TEST
PEC	0.0	0.8	1.7	3.7
POL	0.2	0.4	1.1	2.9
LIT	0.4	2.8	4.1	-
CAP	0.2	3.2	4.7	6.4
PVCS	0.4	5.6	5.9	-
CEM	2.9	5.8	6.2	-
HYD	0.6	6.3	5.3	-
SUL	0.4	6.7	5.3	6.5
DIX	0.7	8.5	6.0	-
PRO	0.1	9.6	5.4	-
POP	9.3	14.3	12.7	-
VES	3.6	21.0	10.2	9.0



PROCESS FLOW SHEET

AUGUST 1977

P.V. CONTAINER SYSTEMS LTD

SIEVE ANALYSIS & MOISTURE CONTENT

Sample Dated August 19, 1977

Sieve Analysis

Sieve Size	As Received	Stress Level #1		Stress Level #2	
		(A)	(B)	(A)	(B)
3/8 +3/8"	0.5	0.0	0.0	0.0	0.0
#4U.S. 3/8"x4.75mm	47.3	22.5	18.6	0.4	0.2
#8U.S. 4.75x2.38	49.4	48.2	50.5	33.1	29.6
#16U.S. 2.38x1.19	2.0	18.6	19.5	48.0	52.0
#50U.S. 1.19x0.297	0.4	4.9	5.8	12.4	12.6
#-50U.S. 0.297x0	0.4	5.7	5.6	6.1	5.6

Moisture

	(A)	(B)
Surface	2.62	2.72
Internal	0.82	0.84
	3.44	3.56

R.M.HARDY & ASSOCIATES LTD.
CONSULTING ENGINEERING & PROFESSIONAL SERVICES
• MATERIALS ENGINEERING & SCIENCE DIVISION

File No. N5195

September 12, 1977

P.V. Container Systems Limited,
355 Fourth Avenue, S.W.,
1050 Three Calgary Place,
Calgary, Alberta.
T2P 0J1

Attention: Dr. Frank Worthington

Dear Sir:

re: Moisture Contents and Friability Test Results for the Sulphur Samples Received September 1 and 8, 1977

Three individually bagged sulphur samples of approximately 700 grams each were received September 1, 1977 and marked as follows:

+4.75 mm
4.75 x 4 mm
4 x 2 mm

Each sample was subjected to the Stress Level I and II Friability testing. The results can be found in Table No. 1.

On September 8, 1977, three fresh samples of the above-mentioned sizes were received for moisture determination only. Table No. 2 lists these results. It should be noted here that during our telephone conversation of September 8, 1977, you had mentioned that these samples had been sitting in pans for a few days prior to my receiving them. This would explain their low surface moisture contents.

Respectfully submitted,

R.M. HARDY & ASSOCIATES LTD.

Per: Don Frame

DF:jw

D. Frame, C.E.T.
Materials Science Division

TABLE NO. 1

FRIABILITY TEST RESULTS

Sieve Size	PERCENT RETAINED					
	Stress Level I			Stress Level II		
	+4.75 mm Sample	4.75 x 4 mm Sample	4 x 2 mm Sample	+4.75 mm Sample	4.75 x 4 mm Sample	4 x 2 mm Sample
3/8" 9.5 mm	-	-	-	-	-	-
#4 4.75 mm	38.6	0.2	-	0.9	-	-
#8 2.36 mm	33.7	39.8	47.4	48.8	24.4	14.8
#16 1.18 mm	13.3	38.6	36.1	34.0	57.6	65.8
#50 0.3 mm	5.7	12.5	10.7	10.4	12.2	14.4
-#50	8.7	8.9	5.8	5.9	5.8	5.0
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0

TABLE NO. 2

MOISTURE CONTENTS

Sample	% Surface H_2O	% Total H_2O
+4.75 mm	0.01	0.38
4.75 x 4 mm	0.01	0.10
4 x 2 mm	0.03	0.07

On the following page are data of various tests conducted at the Agrico Faustina plant on Canadian prilled sulfur. The Faustina plant is located at Donaldsonville, Louisiana, on the Mississippi River about midway between Baton Rouge and New Orleans.

Agrico had seventy (70) tons of prilled sulfur product shipped from Canada in an open top bottom dump railroad hopper car. The prilled product was unloaded at the rate of approximately 35 tons per hour into a railcar receiving hopper. The discharge from the hopper was transported by several inclined rubber belt conveyors to a common discharge point. The discharge from the belt was caught in a payloader bucket and dumped into an open dump truck (two each in service for continuous operation). The dump truck moved the prilled sulfur to a remote location on Agrico property for storage.

During unloading operations five samples were collected and analyzed for various tests. The averages of those tests appear in the first column. Also, during unloading, the handling characteristics of the prilled sulfur during unloading, belt transport, payloader and dump truck operation were observed.

To determine any increase in the ambient air suspended particulate due to the sulfur operation a network of calibrated General Metalworks high-volume samplers was established. The network consisted of one sampler upwind of the operation (background) and three samplers placed downwind to monitor the railcar dumping, belt transport and payloader-dump truck operation. The samplers were operated for one hour at approximately 45 CFM. No visible sulfur dust was observed so the test was terminated. Results of these tests are reported in column five.

Tests were conducted on and around the stored sulfur pile for pile moisture, rainfall, soil pH at different dilution levels, and drainage from pile runoff due to rainfall. These data are reported in columns two, three, four and six respectively. The last column displays data on laboratory pH determinations on product as received and ground. The test ratio used for these determinations was 10 parts water to 1 part product.

All the various sulfur operations that were conducted at the Faustina plant on May 26, 1977 have been recorded on 35 MM slides for future reference.

ANALYTICAL STUDY OF CANADIAN SULFUR
UNLOADED AT FAUSTINA PLANT
MAY 26, 1977
(PRILLED MATERIAL)

Avg. Analysis of 5 Grab Samples as Car Unloaded

Date: 5/26/77

% H_2O: 1.47

Bulk Density, lbs/Ft^3: 66.2

Sieve Analysis:

Tyler Mesh	Cum. % On
4	7.5
6	27.7
9	66.8
16	95.0
20	97.1
35	98.7
65	99.7
100	99.9

DAILY % MOIST. ANALYSIS

DATE	PILE SURFACE	PILE CORE
5/31	0.05	1.36
6/1	0.15	1.17
6/2	0.88	1.38
6/6	0.13	1.02
6/7	0.03	1.05
6/8	0.07	0.92
6/10	0.02	1.11
6/14	0.79	0.96
6/15	0.08	1.03
6/20	-	1.09
6/22	0.05	0.95
6/24	0.04	0.90
6/27	0.10	0.95
6/28	0.05	1.00
6/30	0.05	1.00
7/7	0.00	0.50
7/8	0.05	0.60
7/11	0.05	0.90
7/12	0.47	1.00
7/14	0.05	1.10
7/15	0.0	0.85
7/18	0.0	0.55

RAINFALL (*AFTER SAMPLE)

DATE	INCHES
5/27	0.24
6/1*	0.44
6/2*	0.11
6/12-13	0.69
6/14	0.05
6/16	0.04
6/19-20	1.24
6/28	0.01
6/29	0.19
7/3	1.79
7/10	1.69
7/13	0.81

SOIL pH

LOCATION: NORTH OF PILE

DATE	(100-1)	(10-1)	(1-1)
5/27	6.8	6.5	6.3
6/1	7.0	6.4	5.6
6/2	7.0	6.7	6.0
6/14	7.1	6.7	6.3
6/15	7.9	7.0	6.3
6/20	7.0	7.0	7.0
7/11	6.7	6.7	7.1
7/14	7.1	6.3	5.9

LOCATION: SOUTH OF PILE

5/27	7.7	7.6	7.2
6/1	8.0	7.9	6.9
6/2	8.2	7.5	7.1
6/14	7.4	6.9	6.9
6/15	7.9	7.7	7.7
6/20	8.1	8.1	8.1
7/11	8.1	7.8	7.3
7/14	8.2	7.9	7.5

LOCATION: EAST OF PILE

5/27	6.5	6.4	6.1
6/1	6.7	6.4	5.8
6/2	6.8	6.1	5.5
6/14	6.9	6.2	5.8
6/15	6.9	6.4	6.1
6/20	6.7	6.4	5.8
7/11	7.1	6.4	6.1
7/14	6.9	6.2	5.3

LOCATION: WEST OF PILE

5/27	6.6	6.7	6.7
6/1	6.9	6.6	6.7
6/2	7.0	6.8	6.7
6/14	7.5	6.6	6.5
6/15	8.2	7.5	6.5
6/20	6.2	6.5	6.5
7/11	6.4	7.2	6.2
7/14	6.4	6.3	6.3

TOTAL SUSPENDED PARTICULATE IN AMBIENT AIR DURING UNLDG.
WIND: N-NW @ 3 MPH, GUST TO 7 MPH

SAMPLER NO.	LOCATION	$\mu g/M^3$
1	25' SW of Car	424
2	50' S of P/L Area	500
3 (Background)	500' N of Car	519
4	25' SE of Car	456

SULFUR PILE DRAINAGE WATER FROM RAINFALL RUNOFF

DATE	AFTER RAIN OF X INCHES	pH	PPM SO_4
6/1	0.44	6.7	326*
6/14	0.64	6.9	0.67
6/15	0.69	5.8	1.38
6/17	0.04	5.9	1.33
6/20	1.24	6.2	1.18
6/30	0.19	6.0	0.69
7/11	1.69	7.1	0.81
7/14	0.81	7.1	0.65

* Sample contained solid sulfur.

(10-1) LAB TEST FOR pH CHANGE

DATE	PRILLED SULFUR pH	GROUND SULFUR pH
6/7	6.8	6.7
6/8	6.8	6.6
6/9	6.5	6.6
6/10	4.0	6.4
6/13	3.4	3.5
6/14	2.7	2.8
6/15	2.8	2.8
6/16	2.5	2.6
6/17	2.5	2.5
6/20	2.5	2.5
6/21	2.5	2.5
6/22	2.5	2.5
6/23	2.5	2.5
6/24	2.3	2.5

environmental science and engineering, inc.
P. O. BOX 13454 ● GAINESVILLE, FLORIDA 32604 ● 904 / 372-3318

77 071 001

September 13, 1977

Mr. Harold Long
Agrico Chemical Company
Post Office Box 1110
Mulberry, Florida 33860

Mr. Long:

As per your request, an evaluation of atmospheric dust emissions from Agrico's Big Bend Sulfur Terminal facility has been conducted by Environmental Science and Engineering, Inc. The emissions data listed below as provided by you in our telecon of 9/15/77, were utilized in the dispersion modeling evaluation:

Particulate emissions: 5 lbs/hr (21.9 tons/year)
Height of release: 15 feet
Area of storage pile: 96,000 ft^2

The Air Quality Display Model (AQDM) was utilized to estimate annual average ground-level concentrations of total suspended particulate matter (TSP) due to operation of the proposed sulfur terminal only. Five-year (1971-1975) annual averaged meteorological data from Tampa, Florida was used, this data being most representative of the Big Bend area. A wind rose of this data is displayed in Figure 1.

A 1.0 km grid spacing was utilized in the AQDM in order to estimate the spatial distribution of annual average concentrations. A reduced receptor spacing of 0.25 km was utilized to define the point of maximum annual-average concentration. Shown in Figure 2 are isopleths of predicted annual average ground-level concentrations of TSP due to operation of the proposed sulfur terminal only. The point of maximum concentration is indicated with a star, and the maximum annual average concentration is 3.1 $\mu g/m^3$.

In order to estimate short-term TSP concentration levels due to emissions from the proposed facility, the method of Larsen[1] was utilized. Larsen's basic premise is that the air quality measurements are log-normally distributed. ESE has found this assumption to be appropriate for TSP data in the rural and urban areas. Larsen's equation relation the annual mean concentration to other averaging times is:

$$C = M\, S_g^{(Z - 0.5 \ln S_g)}$$

Where: M = annual arithmetic mean
S_g = standard geometric deviation
Z = number of standard deviations between median and particular frequency

ESE has found that S_g values for TSP normally fall in the range of 1.4 - 2.0. Analysis[2] of ambient TSP data taken in 1976 for Tampa Electric Company in the vicinity of the Big Bend power plant reflected S_g's of 1.48 and 1.41, annual basis. The average S_g was 1.44. The Z - value of concern corresponds to the maximum 24-hour concentration, and is 2.94. Subsituting this Z - value and the average S_g value into the above equation and utilizing the maximum annual average expected concentration of 3.1 $\mu g/m^3$ yields a maximum 24-hour TSP value of 8 $\mu g/m^3$. This is the expected increase in 24-hour maximum TSP levels in the vicinity of the proposed sulfur terminal, due to the terminals operations done. It is noted that this concentration represents a once-per-year occurrance, and that under typical expected conditions, actual 24-hour concentrations would be much less.

The Tampa Electric Company data taken near Big Bend in 1976 displayed arithmetic mean levels of TSP of about 40 $\mu g/m^3$, and maximum 24-hour levels of about 70 $\mu g/m^3$. Based upon this meaured data and the maximum estimated impact of the sulfur terminal, it is not expected that operation of the proposed terminal will cause violations of the State of Florida ambient air quality standards for TSP, which are:

Annual geometric mean - 60 $\mu g/m^3$
24-hour maximum - 150 $\mu g/m^3$

I hope this letter fulfills your needs. If you have any questions or desire further information, please call.

Sincerely,

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.

Dave Buff

David A. Buff
Engineer
Air Quality Management Group

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1. Larsen, R. I. 1971. A Mathematical Model for Relating Air Quality Measurements to Air Quality Standards. U.S. Environmental Protection Agency, Office of Air Programs, Publication Number AP-89.
2. Tampa Electric Company 1976 Annual Report, Draft, Environmental Science and Engineering, Inc., September 1977.

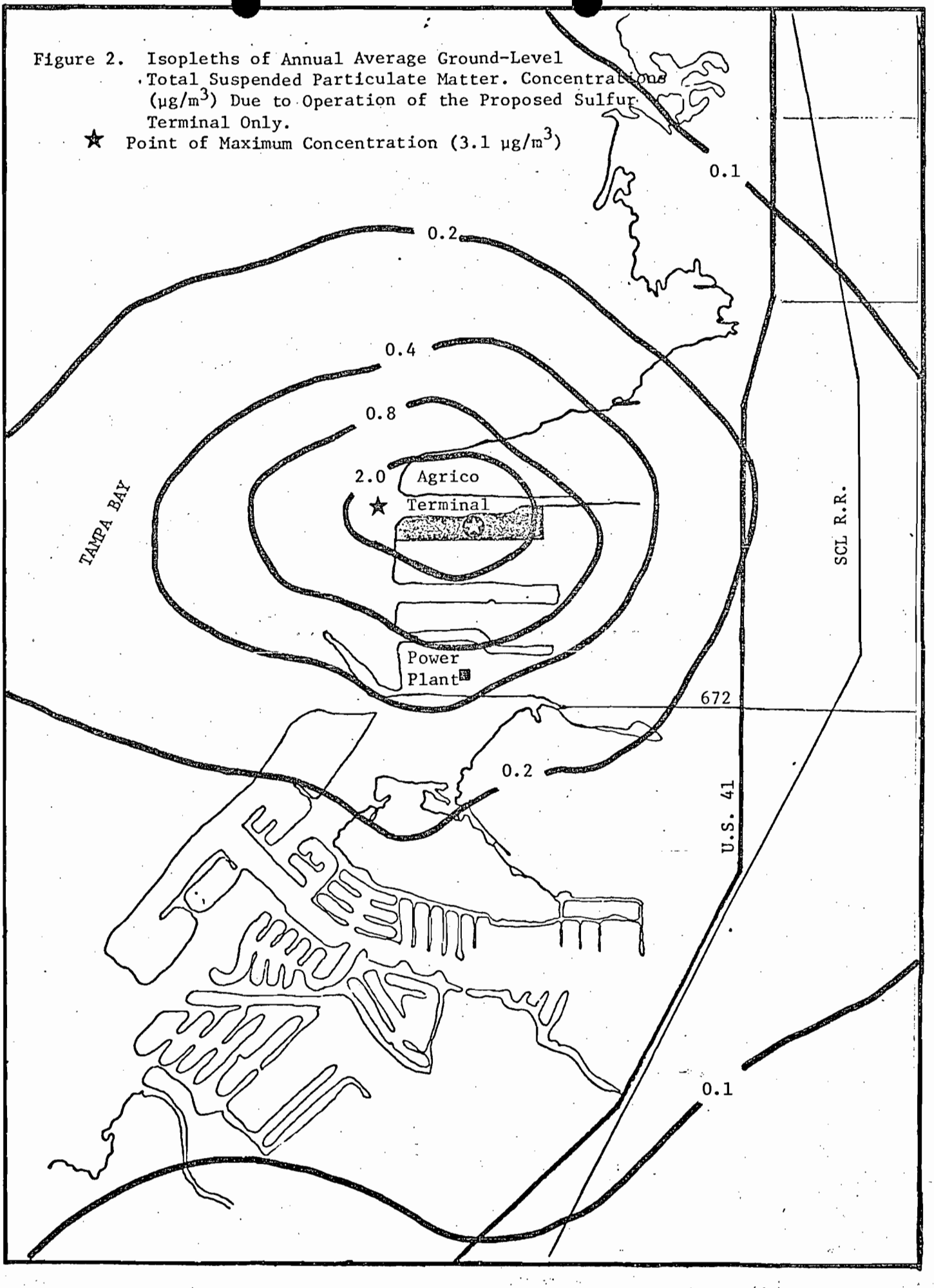


Figure 2. Isopleths of Annual Average Ground-Level Total Suspended Particulate Matter. Concentrations ($\mu g/m^3$) Due to Operation of the Proposed Sulfur Terminal Only.

★ Point of Maximum Concentration (3.1 $\mu g/m^3$)

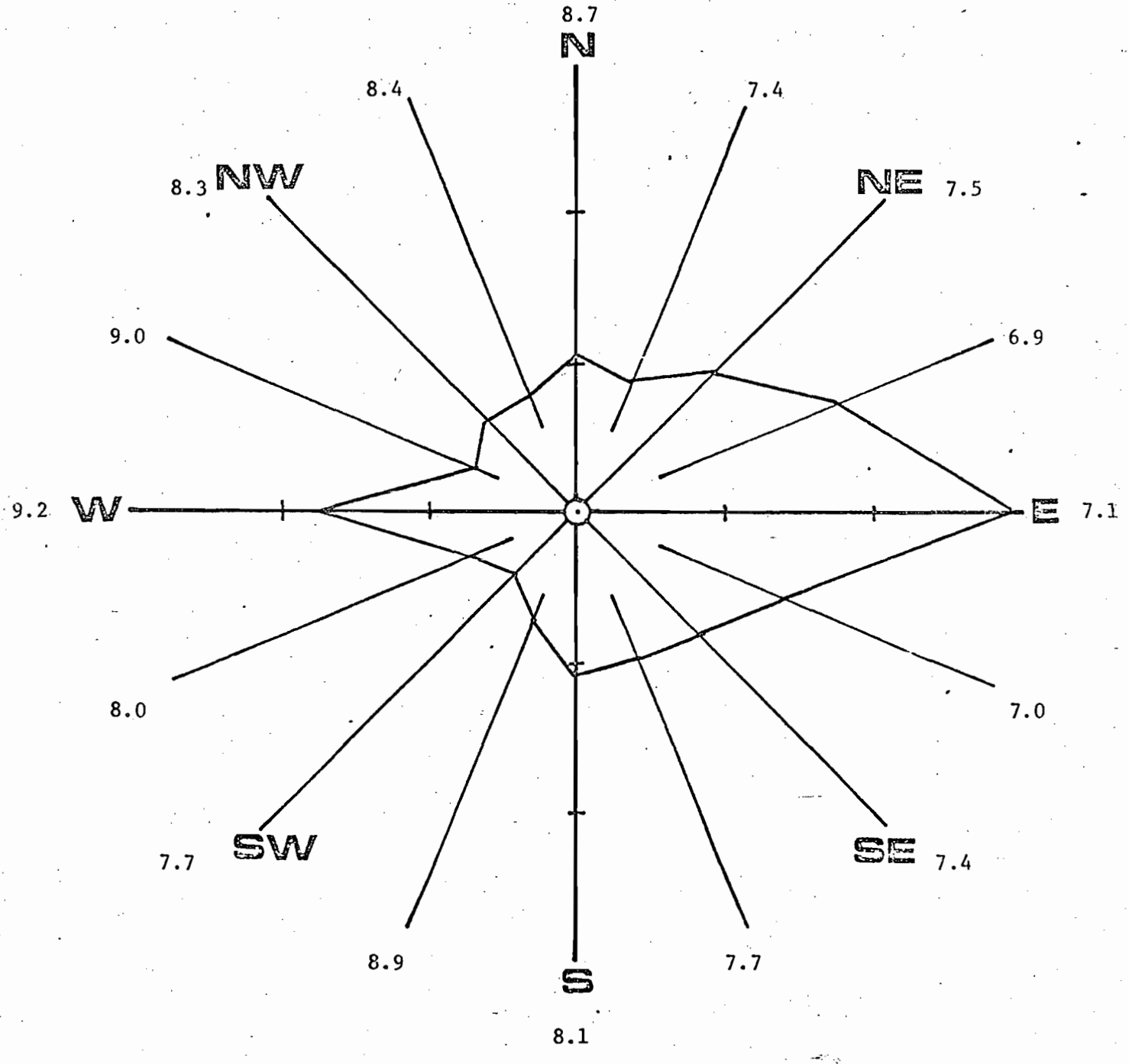


Figure 1. Five-Year Averaged Wind Rose for Tampa, Florida, 1971-1975. Scale: 1" = 5%, Calm = 4.4%. Average Speeds Given in Knots.

An evaluation of the ambient air tests conducted at our Faustina plant and the report of dispersion modeling by Environmental Science and Engineering, Inc. indicates that the proposed Agrico facility would not significantly degrade the air quality in Hillsborough County. The latest reasonably available control technology has been employed for the control of pollutants from this facility by maintaining the material in a moist condition throughout the entire operation.

11.2.3 Aggregate Storage Piles

11.2.3.1 General – An inherent part of the operation of plants that utilize minerals in aggregate form is the maintenance of outdoor storage piles. Storage piles are usually left uncovered, partially because of the necessity for frequent transfer of material into or out of storage.

Dust emissions occur at several points in the storage cycle–during loading of material onto the pile, during disturbances by strong wind currents, and during loadout of material from the pile. The movement of trucks and loading equipment in the storage pile area is also a substantial source of dust emissions.

11.2.3.2 Emissions and Correction Parameters – The quantity of dust emissions from aggregate storage operations varies linearly with the volume of aggregate passing through the storage cycle. In addition, emissions depend on the following correction parameters that characterize the condition of a particular storage pile: (1) age of the pile, (2) moisture content, and (3) proportion of aggregate fines.

When freshly processed aggregate is loaded onto a storage pile, its potential for dust emissions is at a maximum. Fines are easily disaggregated and released to the atmosphere upon exposure to air currents resulting from aggregate transfer or high winds. As the aggregate weathers, however, the potential for dust emissions is greatly reduced. Moisture causes aggregation and cementation of fines to the surfaces of larger particles. Any significant rainfall soaks the interior of the pile, and the drying process is very slow.

11.2.3.3 Corrected Emission Factor – Total dust emissions from aggregate storage piles can be divided into the contributions of several distinct source activities that occur within the storage cycle:

1. Loading of aggregate onto storage piles.
2. Equipment traffic in storage area.
3. Wind erosion.
4. Loadout of aggregate for shipment.

Table 11.2.3-1 shows the emissions contribution of each source activity, based on field tests of suspended dust emissions from crushed stone and sand and gravel storage piles.[1] A 3-month storage cycle was assumed in the calculations.

Table 11.2.3-1 AGGREGATE STORAGE EMISSIONS

Source activity	Correction parameter	Approximate percentage of total
Loading onto piles	PE index[a]	12
Vehicular traffic	Rainfall frequency	40
Wind erosion	Climatic factor	33
Loadout from piles	PE index[a]	15
Total		100

[a]Thornthwaite's precipitation-evaporation index.

74<

Also shown in Table 11.2.3-1 are the climatic correction parameters that differentiate the emissions potential of one aggregate storage [illegible] from another. Overall, Thornthwaite's precipitation-evaporation index[2] best characterizes the variability of total emissions from aggregate storage piles.

The quantity of suspended dust emissions from aggregate storage piles, per ton of aggregate placed in storage, may be estimated using the following empirical expression[1]:

$$E = \frac{0.33}{\left(\frac{PE}{100}\right)^2} \qquad (3)$$

where: E = Emission factor, pounds per ton placed in storage

PE = Thornthwaite's precipitation-evaporation index (see Figure 11.2-2)

Equation 3 describes the emissions of particles less than 30 μm in diameter. This particle size was determined[1] to be the effective cutoff diameter for the capture of aggregate dust by a standard high-volume filtration sampler, based on a particle density of 2.0-2.5 g/cm^3. Because only particles smaller than 30 μm are included, equation 3 expresses the total emissions likely to remain indefinitely suspended. (See section 11.2.1.3).

11.2.3.4 Control Methods – Watering and use of chemical wetting agents are the principal means for control of aggregate storage pile emissions. Enclosure or covering of inactive piles to reduce wind erosion can also reduce emissions. Watering is useful mainly to reduce emissions from vehicular traffic in the storage pile area. Frequent watering can, based on the breakdowns shown in Table 11.2-3, reduce total emission by about 40 percent. Watering of the storage piles themselves typically has only a very temporary, minimal effect on total emissions. A much more effective technique is to apply chemical wetting agents to provide better wetting of fines and longer retention of the moisture film. Continuous chemical treatment of material loaded onto piles, coupled with watering or treatment of roadways, can reduce total particulate emissions from aggregate storage operations by up to 90 percent.[3]

References for Section 11.2.3

1. Cowherd, C., Jr., K. Axetell, Jr., C. M. Guenther, and G. A. Jutze. Development of Emission Factors for Fugitive Dust Sources. Midwest Research Institute, Kansas City, Mo. Prepared for Environmental Protection Agency, Research Triangle Park, N.C. under Contract No. 68-02-0619. Publication No. EPA-450/3-74-037. June 1974.

2. Thornthwaite, C. W. Climates of North America According to a New Classification. Geograph. Rev. *21*: 633-655, 1931.

3. Jutze, G. A., K. Axetell, Jr., and W. Parker. Investigation of Fugitive Dust-Sources Emissions and Control. PEDCo Environmental Specialists, Inc., Cincinnati, Ohio. Prepared for Environmental Protection Agency, Research Triangle Park, N.C. under Contract No. 68-02-0044. Publication No. EPA-450/3-74-036a. June 1974.

7/75

11.2.4 Heavy Construction Operations

11.2.4.1 General – Heavy construction is a source of dust emissions that may have substantial temporary impact on local air quality. Building and road construction are the prevalent construction categories with the highest emissions potential. Emissions during the construction of a building or road are associated with land clearing, blasting, ground excavation, cut and fill operations, and the construction of the particular facility itself. Dust emissions vary substantially from day to day depending on the level of activity, the specific operations, and the prevailing weather. A large portion of the emissions result from equipment traffic over temporary roads at the construction site.

11.2.4.2 Emissions and Correction Parameters – The quantity of dust emissions from construction operations are proportional to the area of land being worked and the level of construction activity. Also, by analogy to the parameter dependence observed for other similar fugitive dust sources,[1] it is probable that emissions from heavy construction operations are directly proportional to the silt content of the soil (that is, particles smaller than 75 μm in diameter) and inversely proportional to the square of the soil moisture, as represented by Thornthwaite's precipitation-evaporation (PE) index.[2]

11.2.4.3 Emission Factor – Based on field measurements of suspended dust emissions from apartment and shopping center construction projects, an approximate emission factor for construction operations is:

1.2 tons per acre of construction per month of activity

This value applies to construction operations with: (1) medium activity level, (2) moderate silt content ($\sim$30 percent), and (3) semiarid climate (PE $\sim$50; see Figure 11.2-2). Test data are not sufficient to derive the specific dependence of dust emissions on correction parameters.

The above emission factor applies to particles less than about 30 μm in diameter, which is the effective cut-off size for the capture of construction dust by a standard high-volume filtration sampler[1], based on a particle density of 2.0-2.5 g/cm^3.

11.2.4.4 Control Methods – Watering is most often selected as a control method because water and necessary equipment are usually available at construction sites. The effectiveness of watering for control depends greatly on the frequency of application. An effective watering program (that is, twice daily watering with complete coverage) is estimated to reduce dust emissions by up to 50 percent.[3] Chemical stabilization is not effective in reducing the large portion of construction emissions caused by equipment traffic or active excavation and cut and fill operations. Chemical stabilizers are useful primarily for application on completed cuts and fills at the construction site. Wind erosion emissions from inactive portions of the construction site can be reduced by about 80 percent in this manner, but this represents a fairly minor reduction in total emissions compared with emissions occurring during a period of high activity.

References for Section 11.2.4

1. Cowherd, C., Jr., K. Axetell, Jr., C. M. Guenther, and G. A. Jutze. Development of Emissions Factors for Fugitive Dust Sources. Midwest Research Institute, Kansas City, Mo. Prepared for Environmental Protection Agency, Research Triangle Park, N.C. under Contract No. 68-02-0619. Publication No. EPA-450/3-74-037. June 1974.

2. Thornthwaite, C. W. Climates of North America According to a New Classification. Geograph. Rev. *21*: 633-655, 1931.

3. Jutze, G. A., K. Axetell, Jr., and W. Parker. Investigation of Fugitive Dust-Sources Emissions and Control, PEDCo Environmental Specialists, Inc., Cincinnati, Ohio. Prepared for Environmental Protection Agency, Research Triangle Park, N.C. under Contract No. 68-02-0044. Publication No. EPA-450/3-74-036a. June 1974.

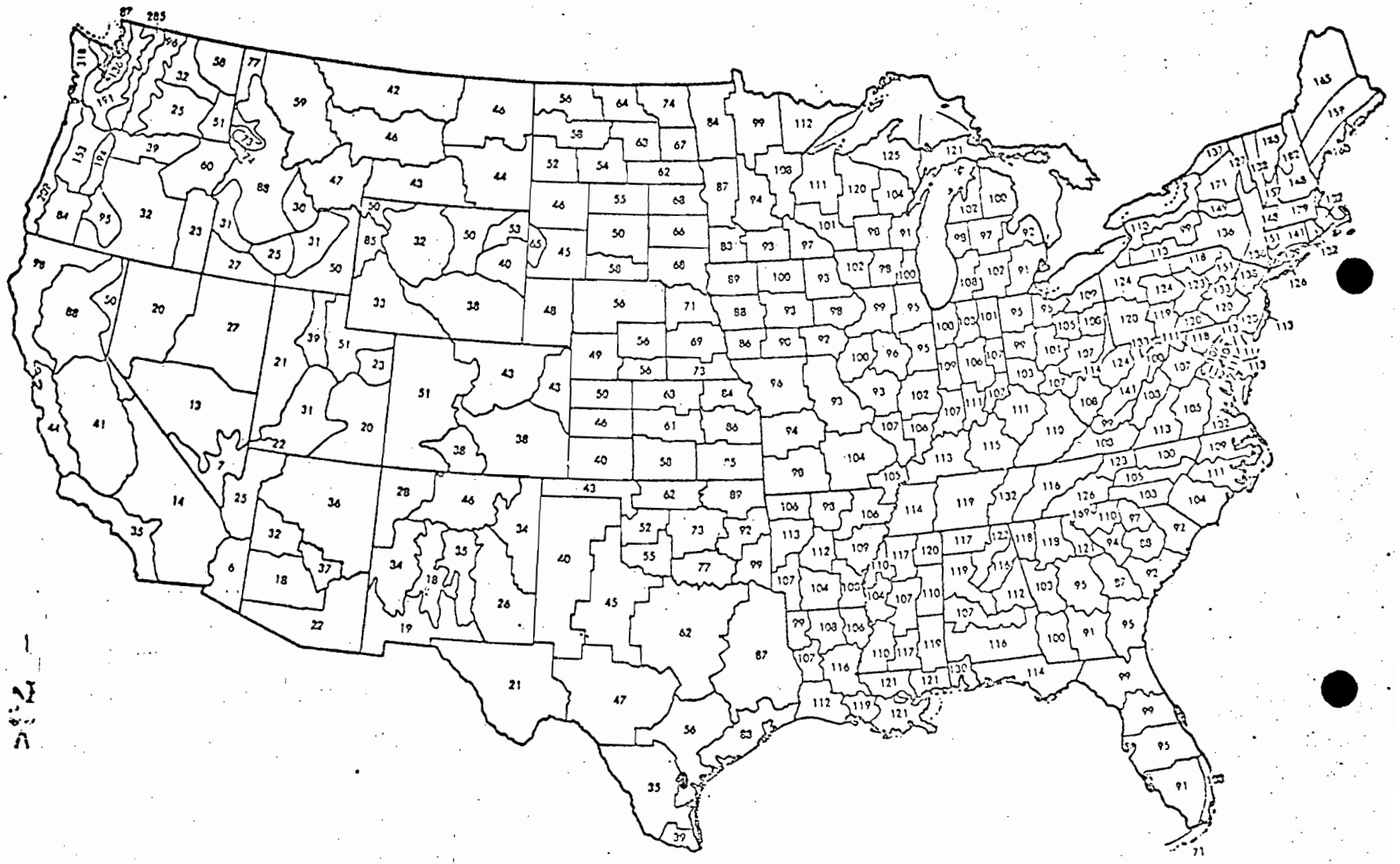


Figure 11.2-2. Map of Thornthwaite's Precipitation-Evaporation Index[3] values for state climatic divisions.

EMISSIONS ESTIMATES

SHIP UNLOADING RATE: 600 Ton/hr.

SHIP UNLOADING FREQUENCY: 12/Yr.

WEIGHT PER SHIPMENT: 30,000 Ton

AP-42 EMISSION FACTOR: (11,2,3):

$$E = \left(\frac{PE}{100}\right)^{\frac{0.33}{2}} = 0.366 \text{ \#/Ton placed in storage}$$

PE: Thornthwaite's PE Index = 95

EFFICIENCY FACTOR: $\frac{(100 - \% \text{ EFF})}{100} = 0.10$

AP-42 EMISSIONS ESTIMATES:

88% - Vehicle traffic, pile erosion, loadout.
12% - Loading onto piles
100% - Storage Pile Operations

TRANSFER OPERATION SCHEDULE: 365 days/yr.
24 hours/day

COMPUTATIONS:

Unloading Emissions

600 T/hr. x 0.366 x 0.10 x 0.12 = 2.64 #/hr.

Transfer Emissions

$$\frac{30{,}000 \times 12 \times 0.366 \times 0.10 \times 0.88}{365 \times 24} = 1.32 \text{ \#/hr.}$$

AIR POLLUTION PERMIT SUPPLEMENT

(1) Design unloading rate 600 TPH
2% Moisture in product - 12 TPH

Product Rate 588 TPH

(2) Efficiency estimation - see Test Data - Total suspended particulate and 11.2.3 "Aggregate Storage Piles" AP-42.

(6) Storm Water from the proposed construction site presently reports to our existing holding pond. Contractor has assured Agrico that this will not be changed during or after construction.

Tests developed for evaluating sulfur

Handling characteristics and particle stability are under comparative study to establish acceptable test standards

M. E. D. Raymont, Sulfur Development Institute of Canada (SUDIC), Calgary, Alberta, Canada

TESTS are being developed for evaluating handling quality of formed sulfur used in intercontinental trade. Certain parameters have been identified that control the handling stability of formed sulfur which will be evaluated from procedures now under development. Early procedures are being compared with field performance to establish standards for quality evaluation.

Today, intercontinental movement of solid sulfur is initiated by exporting countries: Canada, Poland, Mexico, Iran, Iraq, France and the United States. Imbalance between supply and consumption areas is such that producers must handle an increasing part of their production in the solid state rather than as a liquid—a common transportation mode for intercontinental movements. For example, Canada now consumes only 10 percent of its production and exports overseas between 40 and 60 percent of the remainder (2.5 to 3.5 million tons per year). These exports are shipped as slate. Prill and lump sulfur are also shipped by some countries. Resistance to dusting, moisture pickup and other undesirable degrading influences varies with the manner in which the sulfur has been formed.

Three principal areas of concern bear directly on the suitability of formed sulfur for transportation: friability, moisture performance and handling characteristics. Within each of these areas a variety of tests have been devised to elicit the differences in behavior between various forms Some test procedures are currently being refined, therefore, full test procedures are not detailed here.

FRIABILITY

Friability is perhaps the most important criteria for transportation suitability. Elemental sulfur is brittle and thus during transportation and handling has a tendency to break down and form dust which can be explosive and/or environmentally damaging. In addition, presence of significant amounts of fine material can adversely affect moisture uptake, moisture retention and handling characteristics.

The relative degradation of various sulfur types can be compared by simulating stresses imposed during typical handling conditions. The apparatus consists of a hollow metal cylinder which is rotated end-over-end about its midpoint. The rotation speed is adjusted to permit degradation by abrasion and impact. Weighed, screened samples of formed sulfur are introduced into the cylinder and subjected to a standard number of rotations. Sieve analyses of the stressed samples are compared with those of the initial samples to examine the degree of breakdown. Fines dust, which is easily airborne, is arbitrarily defined as that material which passes through a 50 mesh screen.

Crystal structure rearrangements can occur in formed sulfur over a period of time since all forming processes involve quenching. Friability tests conducted at weekly intervals for up to 25 weeks after production show how various sulfur forms deteriorate (Fig. 1).

Clearly this test differentiates between various sulfur forms. There is a clear correlation between particle geometry and fines production. Particle size is also very important since energy dissipation on impact is a function of particle mass. Other factors influencing degradation include surface rugosity, internal voids and crystallinity.

This test acts as a useful over-all technique for measuring relative degradation but does not differentiate between the effects of particular stresses. A second series of breakdown tests attempts to identify the individual action of four types of stresses including impact, abrasion, compaction and vibration. Test results (Table 1) show less degradation than with the over-all friability tests. The stress levels used are lower than the combined effect of the over-all test. These tests, however, distinguish between various forms and rank them in the same order as in the over-all test. Performance in the stress tests is truly anomalous for only one form (F).

A clear correlation can be established between characteristics of a form and its susceptibility to a particular degradation mechanism by separating the effect of the various stresses (Table 2).

The long-term effects of atmospheric exposure on friability have very little effect on the friability of any form according to a preliminary series of outside tests. However, there are indications that freeze/thaw cycling can be damaging to some forms. This possibility is being studied.

MOISTURE PERFORMANCE

Three specific aspects are of concern: moisture content as formed, moisture uptake on wetting and rate of moisture loss on standing.

Products of wet sulfur forming have an inherent moisture content since they use water quenching. The moisture level can be reduced by mechanical dewatering and/or applied heat, but inevitably this drying stage adds to process cost. Dry air prilling or granulating techniques do not suffer from this disadvantage.

Inherent product moisture levels are adequately determined from weight loss from drying to constant weight in a vacuum drying oven (Table 3).

Moisture uptake on wetting is determined by comparing sample weight before and after immersion. Dried weighed samples are immersed in water, patted dry to remove excess surface moisture, and reweighed. Weight difference corresponds to moisture uptake on wetting. Six of the eight forms (A to F) showed significant moisture uptake after immersion (Table 3). Some correlation is observed between moisture uptake and internal voids and/or particle size distribution.

The rate of moisture loss is such that all forms return to their original dried weight within 24 hours when left in a constant low humidity atmosphere that such a simple test cannot be relied upon. Accurate and reliable test procedures using neutron probe moisture measuring techniques are being used for further experimental work.

HANDLING CHARACTERISTICS

The behavior of bulk solids depends on such factors as particle size, shape, uniformity, rugosity, density, surface area, hardness, deformability and cohesiveness. However, these properties cannot be directly related to field experience and design criteria. Accordingly, four bulk parameters may be considered for comparative evaluation: bulk density, angle of repose, compressibility and flowability.

Bulk densities and angles of repose. While variation in bulk density can be observed (Table 4), no simple relationship exists between density and any one form characteristic. A combination of particle size, shape and size distribution appears to control bulk density. Interestingly, the angles of repose produce an identical rank ordering (from lowest to highest) as that obtained in the friability test (Fig. 1). It is very evident that shape and size distribution determine the angle of repose. Surface rugosity and cohesiveness appear to be much less important for sulfur forms.

Compressibility and flowability. Compressibility is determined from the magnitude of the increase in bulk density which occurs when the sample is packed by settlement. It is given by the expression

$$\% \text{ Compressibility} = \frac{100\ (P - A)}{P}$$

where P is the packed bulk density and A is the aerated bulk density. Compressibility values (Table 4) range from 8 percent for Form A which is of uniform size and approximately spherical geometry to 34.4 percent for Form G which has an irregular shape and a highly varied size distribution. Forms with the lowest compressibility values show the least degree of packing and settlement during handling and transportation.

TABLE 1

% Fines After Subjection to Stress (% < 50 mesh)

Form	Type of Stress				Non-weighted Total
	Impact	Abrasion	Compaction	Vibration	
A	0.8	0.0	0.0	0.0	0.8
B	0.5	0.1	0.0	0.2	0.8
C	1.0	0.1	0.0	0.0	1.0
D	2.4	0.2	0.4	0.7	3.7
E	3.6	0.1	0.0	0.2	3.9
F	8.0	8.4	0.4	9.1	25.9
G	2.8	2.9	1.3	1.9	8.9
H	1.7	3.0	0.4	0.7	5.8

TABLE 2

Form Characteristic	Stress Susceptibility			
	Impact	Abrasion	Compaction	Vibration
Geometry	X	X	X	X
Mass	X			
Internal voids	X		X	
Surface rugosity		X	X	
Size distribution				X
Crystallinity	X			

TABLE 3

Sample Form	Initial Moisture Content % (As Received Sample)	Moisture Uptake %
A	0.0	1.4
B	0.0	1.7
C	5.4	1.1
D	1.1	1.2
E	3.1	1.5
F	7.0	1.6
G	0.1	0.1
H	0.1	0.5

TABLE 4

Form	Bulk Density (Unhandled sample)		Angle of Repose (θ)	Compressibility (%)	Flowability	
	(lbs./cu. ft.)	(kg/m³)			Score (max/100)	Rating
A	73	1170	29	8.0	91	Excellent
B	72	1150	30	12.6	88	Good
C	65	1040	32	14.0	86	Good
D	77	1235	32	11.5	87	Good
E	72	1150	32	11.3	86	Good
F	76	1220	35	19.5	78	Fair
G	65	1040	40	34.4	66	Poor
H	73	1170	40	18.6	68	Passable

* Field observation.

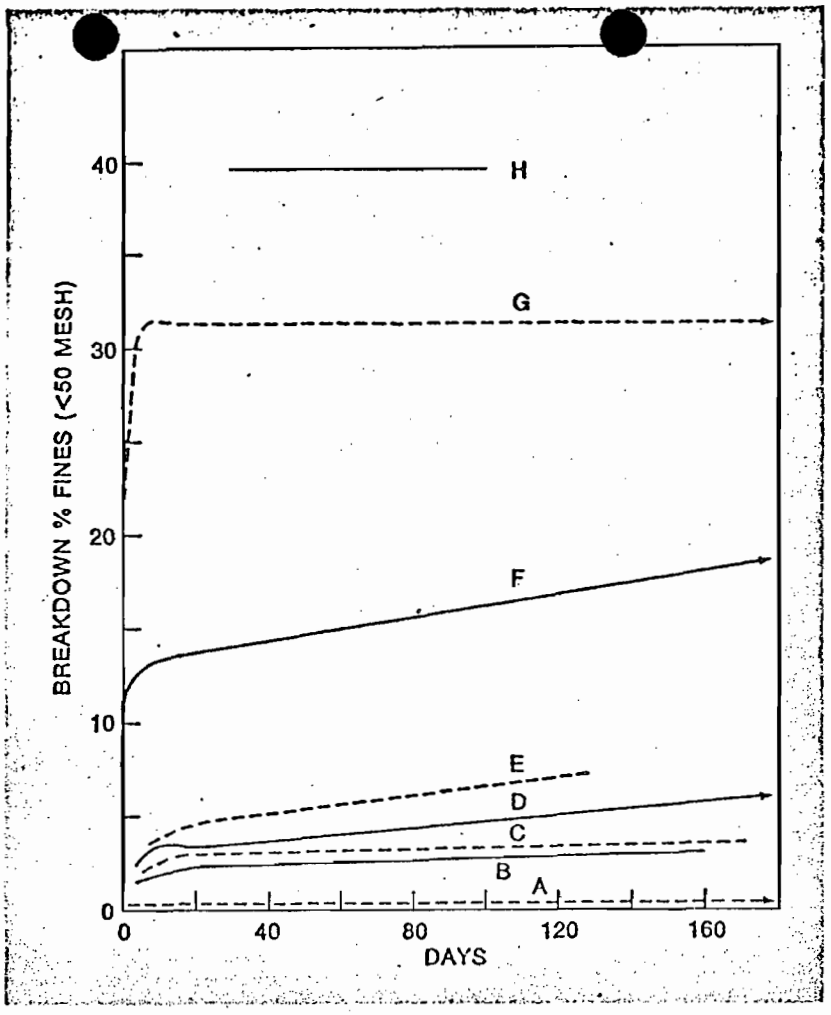


Fig. 1—Effect of aging on breakdown as determined by the tumbling test.

Flowability. No single experimental test provides a satisfactory measure. However, relative flowability, which is important for design of storage and handling systems, can be calculated by combining data on angle or repose, compressibility, angle of spatula and coefficient of uniformity. Over 2,800 bulk solids have been tested[1] and the results reported as a point score between 0-100. This range is divided into seven categories of flowability ranging from excellent to very, very poor. The results (Table 4) show that Forms *A* to *E* have very acceptable flowability characteristics. However, Forms *F*, *G* and *H* have poorer ratings and may have a tendency to bridge, arch or hang up in gravity reclaim systems and storage hoppers.

Two additional factors may significantly affect the flowability of the various forms. First, moist samples will generally score about 5-10 percent lower on the flowability point score. Moisture tends to be more of an impediment to flow for the irregularly shaped forms with higher fines content than for the spherical forms. Second, handling and its related dust formation will also decrease the flowability points score. All results reported here are for unhandled products. However, preliminary results of flowability evaluations on forms which have been subjected to mechanical handling indicate that the most friable forms become significantly poorer while the least friable forms are almost unaffected. The most resistant forms produce little dust on handling and are, therefore, in a very similar condition compared with their unhandled state; by contrast, the poorer forms break down more easily on handling giving more dust, and as a result, change significantly. The more friable forms are thus much more varied in their flowability performance, and indeed, in the handling and storage characteristics generally.

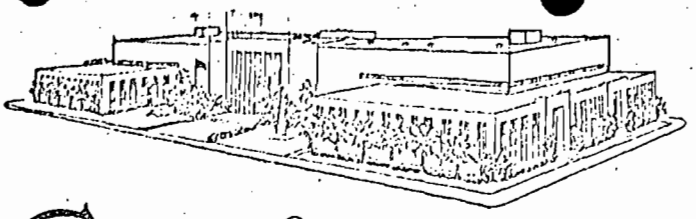
One aspect—conveyor performance—has not been directly examined. Indications are that with the appropriate choices of conveyor angle, belt sag and idler spacing, none of the forms should present any special problems during conveying. However, since this is clearly an important area, these indications need to be confirmed.

About the author

MICHAEL E. D. RAYMONT *is projects coordinator for Sulphur Development Institute of Canada, Calgary, Alta., where he is responsible for projects aimed at developing new uses for sulfur. Dr. Raymont holds the Ph.D. degree in chemistry from the University of Calgary. Prior to his present association he was with Alberta Sulfur Research Ltd. and Western Research. He is a member of CNGPA, ACS, CIC and CSChE.*

LITERATURE CITED

[1] Carr, R. L., *Chemical Engineering*, Jan. 13, 1965, p. 163-168 and Feb. 1, 1965, p. 69-72.



COUNTY of HILLSBOROUGH
Tampa, Florida 33601

ROGER P. STEWART
DIRECTOR

STOVALL PROFESSIONAL BLDG.
305 N. MORGAN ST.
6th FLOOR
TAMPA, FLORIDA 33602

TELEPHONE (813) 223-1311
EXT. 643

Mr. Harold Long, Jr.
Manager, Environmental Control
Agrico Chemical Co.
P.O. Box 1110
Mulberry, Fla. 33860

Re: Permit AC29-2305

Dear Mr. Long:

After inspecting and seeing in operation your Wet Phosphate Rock Handling Facility covered by the above permit, we have concluded that it is not a source of air pollution.

For this reason, we are recommending to the Department of Environmental Regulation that an Air Pollution Operation Permit should not be required for this facility as long as it handles wet phosphate rock only.

Sincerely,

Arturo McDonald

Arturo McDonald
Air Engineer

cc. J.H. Kerns, P.E.
District Engineer
Dept. of Environmental Regulation
P.O. Box 9205
Winter Haven, Fla. 33880

ac Toland
Mitton
Downey

BEST AVAILABLE COPY

ENVIRONMENTAL PROTECTION COMMISSION

DIRECTOR

STOVALL PROFESSIONAL BLDG

TAMPA, FLORIDA

COUNTY of HILLSBOROUGH
Tampa, Florida 33601

October 3, 1975

Mr. Harold Long, Jr.
Manager, Environmental Control
Agrico Chemical Co.
P.O. Box 1110
Mulberry, Florida 33860

RE: Air Pollution Permit AC29-2360

Dear Mr. Long:

After consultation with the Department of Environmental Regulation, we have concurred that phosphoric acid storage tanks should not be considered sources of air pollution.

For this reason, further air pollution permits will not be necessary for the storage tanks covered under the above permit.

Sincerely,

Arturo McDonald
Air Engineer
Hillsborough County Environmental
Protection Commission

AMcD/slp

cc: J.H. Kerns
Ted R. Raulerson, Jr.

LOUIS de la PARTE, JR., P. A.
ATTORNEYS AT LAW
403 NORTH MORGAN STREET
TAMPA, FLORIDA 33602

LOUIS de la PARTE, JR.

AREA CODE 813
229-2775

September 12, 1977

State of Florida
Department of Administration
Division of State Planning
660 Apalachee Parkway
Tallahassee, Florida 32304

Dear Sirs:

Enclosed are requests for a binding letter determining whether our project is a development of regional impact or a "substantial deviation" from our previous development order.

If any further information is required, please call me.

Sincerely,

Louis de la Parte, Jr.

LdlF/sa
Enclosures

cc: Mr. Harold Long