KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
904/377-5822 ▪ FAX 377-7158

RECEIVED
APR 16 1992
Division of Air
Resources Management

KA 261-91-01

April 10, 1992

Mr. John Bunyak
National Park Service
12745 W. Alameda Parkway
Lakewood, CO 80228

Subject: Response to Comments on FDER's Technical Evaluation
Agrico Chemical Company
Permit Files AC53-201152, AC53-199112, PSD-FL-179

Dear Mr. Bunyak:

This is in response to our telephone conversation yesterday on the above subject. Your verbal comments on the method of emission calculations and the determination of 4.0 pounds per ton of 100 percent sulfuric acid as BACT for the double absorption sulfuric acid plant are addressed below.

RESPONSE 1: EMISSION CALCULATIONS

The actual emissions of sulfur dioxide from the sulfuric acid plant Nos. 10 and 11 were calculated based on results of annual compliance tests. A representative test was used as a basis for calculating annual emissions as follows (e.g. No. 10 plant):

Compliance test results: 306.8 lbs/hr (333 lbs/hr permitted)
3.21 lb/ton (4.0 lb/ton permitted)

Initial calculations (submitted 6/91), based on operating hours:

Annual SO2 = 306.8 lb/hr X 8760 hrs/yr X ton/2000 lbs
= 1343.8 tpy

Revised calculations (submitted 3/92), in response to FDER's request to base the actual emissions on actual 1989 and 1990 production:

Annual SO2 = 3.21 lb/ton X (638,230 + 728,999)/2 tons/yr
X ton/2000 lbs
= 1097.2 tpy

The difference in actual annual emissions calculated using the two methods described above results from variation in the production rate over time. Therefore, the lb/hr and lb/ton values correlate for a given test run where the production rate used in the compliance test emission calculation is a constant. However, this relationship does not hold for an annual period where the hourly production rates are not constant.

RESPONSE 2: BACT DETERMINATION

FDER and EPA concur with the applicant's BACT review for the double absorption sulfuric acid plants. A sulfur dioxide emission limit of 4.0 lb/ton of 100 percent acid is appropriate for the Nos. 10 and 11 sulfuric acid plants despite a compliance test result of 3.21 lb/ton for the following reasons:

The emission rates vary with time and cannot be guaranteed at 3.21 lb/ton because:

- The emission rates vary with variations over time in the process temperature, pressure, SO2 concentrations, conversion efficiency, absorption efficiency, etc.
- The catalyst efficiency varies from the time it is replaced until it is next replaced during a plant turnaround.

It would be impractical to impose an emission limit so close to a level corresponding to normal operations that any variation would result in excess emissions. This could bring about a situation where while operating under normal conditions, a plant would be in compliance with an emission limit 50 percent of the time and out of compliance 50 percent of the time.

Attached is a typical emission scenario based on actual CEM data for sulfuric acid plant No. 10 during March, 1992.

If you have any questions, please do not hesitate to give me a call.

Very truly yours,

KOOGLER & ASSOCIATES

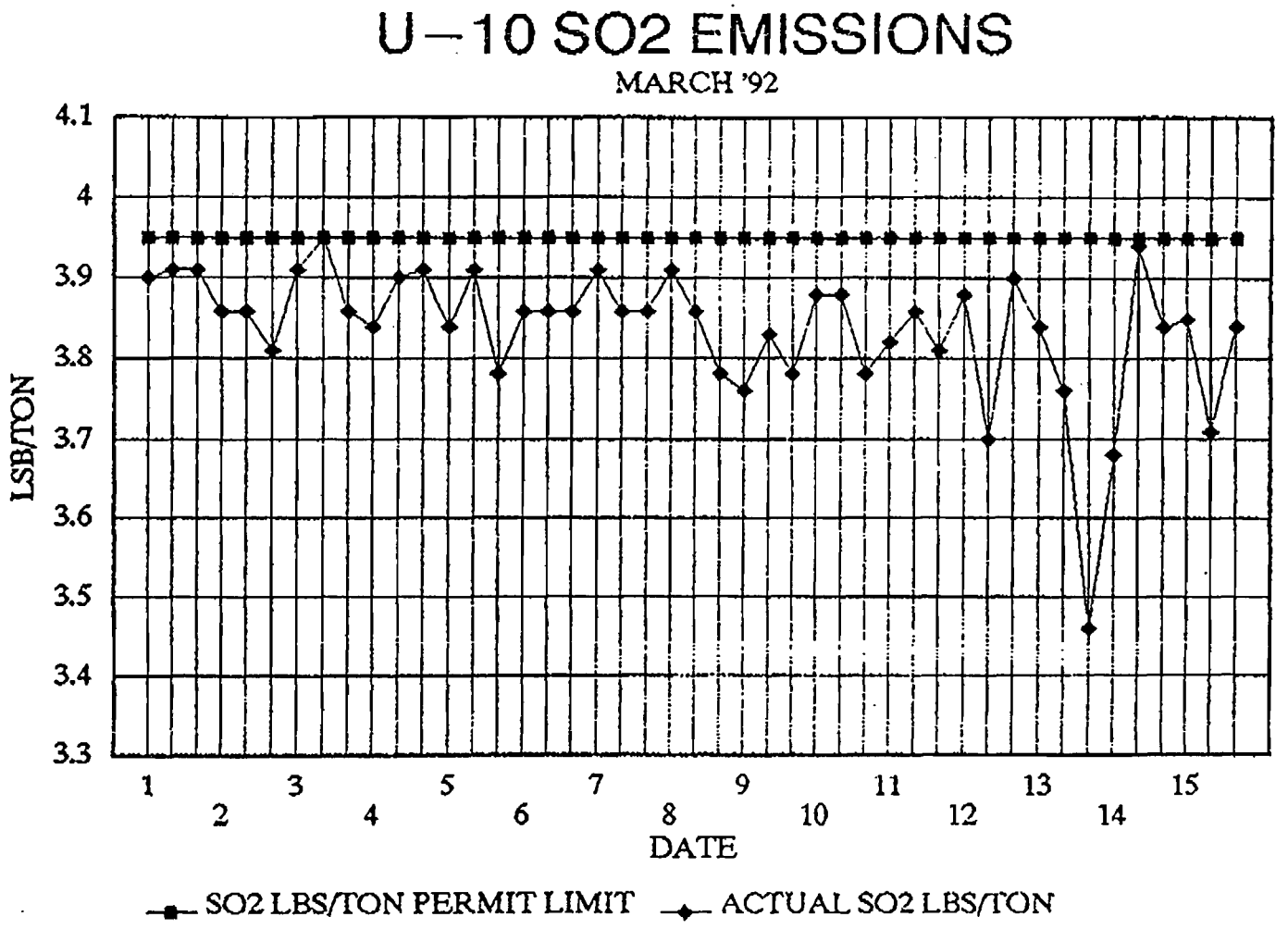
Pradeep A. Raval

PAR:mab

cc: Mr. Selwyn Presnell, Agrico
Mr. Phil Steadham, Agrico
Mr. Willard Hanks, FDER, Tallahassee
Mr. Gregg Worley, EPA Region IV

CEM DATA SUMMARY
SULFUR DIOXIDE EMISSIONS - NO. 10 SULFURIC ACID PLANT

AGRICO CHEMICAL COMPANY
POLK COUNTY, FLORIDA



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ENVIRONMENTAL SERVICES
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GAINESVILLE, FLORIDA 32609
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FAX TRANSMITTAL FORM

TO: Clive Holladay
DARM
Fax # 922 6979

FROM: Pradeep Raval

PROJECT: 261-91-01

SENT BY: PR

DATE: 4/15/92

FAX PHONE: 904-377-7158

The text being transmitted consists of 1 page PLUS this one.

REMARKS: Summary of latest MESOPUFF II modeling as per NPS request.
PR

SUMMARY OF MESOPUFF AIR QUALITY MODELING ANALYSES

AGRICO CHEMICAL COMPANY, POLK COUNTY, FLORIDA
FILE NO. AC53-199112 AND PSD-FL-179

Option(1)	Impact of All Increment Consuming Sources(2)			Impact of Emissions from Proposed Agrico Project	
	24-Hr Periods with Impact >5 μg/m3 (Julian Day, 1986)	Max 24-hour Impact (μg/m3)	Number of Class I Receptors with impact >5 μg/m3	24-hour Period (Julian Day, 1986)	Max 24-hour Impact at any Class I Receptor on Julian Day (μg/m3)
Gaussian Vertical Dispersion Algorithm					
1	329	6.50	5	329	0.069
2	329	6.43	5	329	0.069

(1) Gaussian Dispersion Algorithm used for Vertical Dispersion

Option	Technical Model Options Employed
1	Dry Deposition
2	Dry Deposition + Chemical Transformation

(2) 24-Hour SO_2 Impact of all PSD increment consuming sources on Chassahowitzka Class I Area.

United States Department of the Interior
FISH AND WILDLIFE SERVICE
75 SPRING STREET, S.W.
ATLANTA, GEORGIA
30303

April 10, 1992

RECEIVED
APR 13 1992
Division of Air
Resources Management

Mr. C. H. Fancy
Chief, Bureau of Air Regulation
Florida Department of
Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Dear Mr. Fancy:

On April 9, 1992, John Notar of the Air Quality Branch contacted you regarding a request to extend the 30-day comment period for the Agrico Chemical Company's (Agrico) Prevention of Significant Deterioration (PSD) application to modify their South Pierce sulfuric acid production facility. This comment period extension was requested because we have not yet received a final MESOPUFF II dispersion modeling analysis for the Chassahowitzka Wilderness Area (WA), a class I air quality area. As you know, the South Pierce facility is located 126 km southwest of the Chassahowitzka WA. I understand that the Florida Department of Environmental Regulation (FDER) has agreed to extend the comment period to allow us 5 days from the time we receive the analysis, to submit followup comments on the Agrico project. Our Air Quality Branch has discussed the MESOPUFF II analysis with Agrico's consultant, and they agreed to submit the final analysis shortly. Until that time we offer the following comments for your consideration.

The proposed modification would allow Agrico to increase the production rate at the plant from 2,000 to 2,700 tons per day, resulting in significant increases in sulfur dioxide (SO_2) and sulfuric acid mist (H_2SO_4) emissions. You may recall that in an earlier letter to you, we indicated that we did not oppose Agrico's commencing construction on the heat recovery project associated with the PSD application, as long as they agreed to satisfactorily address our concerns about increment consumption in the wilderness area. As indicated above, Agrico has not yet completed this analysis.

The initial dispersion modeling that Agrico performed with the Environmental Protection Agency's Industrial Source Complex Short Term guideline model indicated that the SO_2 emissions from the proposed modification would significantly contribute to a violation of the 24-hour class I increment in the Chassahowitzka WA. Agrico, at our request, then performed an additional

modeling analysis using the EPA long-range transport MESOPUFF II model, to predict the cumulative impact at Chassahowitzka from the proposed increased emissions from the Agrico modification, combined with emissions from other increment-consuming sources.

The results of this analysis also indicate that there would be a violation of the class I 24-hour SO_2 increment. However, the analysis did not indicate if Agrico would contribute significantly to the modeled increment violation. The additional analysis that is currently being performed by Agrico's consultant should provide this information. If Agrico's impact to the class I increment violation is below our significant increment level, we would not oppose the issuing of the Agrico permit.

Regarding the Best Available Control Technology (BACT) analysis, we agree that Agrico's proposal to use double absorption to control SO_2 emissions and high efficiency mist eliminators to control H_2SO_4 emissions represents BACT. However, Agrico simply proposes the New Source Performance Standards (NSPS) for these pollutants as the BACT limit. The actual emissions data submitted by Agrico indicate that limits lower than the respective NSPS are achievable for these units. For example, compliance test results for years 1986 through 1990 indicate that the SO_2 rate for Unit 10 ranged from 2.58 pounds per ton (lb/ton) to 3.28 lb/ton, and for Unit 11 the rate ranged from 3.41 to 3.56 lb/ton. The same data show that the H_2SO_4 emission rate from Unit 10 ranged from 0.08 to 0.143 lb/ton, and for Unit 11 the rate ranged from 0.102 to 0.128 lb/ton. The NSPS limits for SO_2 and H_2SO_4 are 4.0 lb/ton and 0.15 lb/ton, respectively.

The NSPS is the "floor" in the BACT analysis. In other words, a BACT limit cannot be less stringent than a NSPS, but oftentimes is more stringent than such standards. In addition, a key consideration in the BACT analysis is the need to comply with the PSD increments and Ambient Air Quality Standards (AAQS). Because of documented violations of the class I SO_2 increment (24-hr average) at the Chassahowitzka WA, the FDER should take every opportunity to minimize SO_2 emissions in the area.

Also, the results of Agrico's AAQS analysis indicate that the maximum predicted concentration is nearly 99 percent of the 24-hr Florida AAQS (256 of the 260 ug/m^3 standard). Consequently, in order to be able to accommodate additional industrial growth in the area, and to ensure future compliance of the Florida AAQS, the FDER should establish allowable permit conditions for new sources that reflect the actual capabilities of the proposed best available emissions control technology. In the case of Agrico, although we realize that the SO_2 and H_2SO_4 emissions vary somewhat as the catalyst ages, based on the historical operating data discussed above, it would appear that emission rates more stringent than the proposed NSPS limits are achievable at the

facility. Therefore, we ask that the FDER establish SO_2 and H_2SO_4 limits for Units 10 and 11 that are more representative of those achievable, rather than the less stringent NSPS levels.

In conclusion, model results indicate an increment violation at the Chassahowitzka WA. It is unclear at this time whether Agrico contributes significantly to that violation. Therefore, we will send our final comments regarding the Chassahowitzka WA increment issue within 5 days of receiving the additional analysis. However, we do ask that the FDER establish SO_2 and H_2SO_4 limits for Units 10 and 11 that are more representative of those achievable, rather than the less stringent NSPS levels that are currently proposed for the Agrico facility.

If you have any questions regarding our comments on the Agrico application, please call Tonnie Maniero of our Air Quality Branch in Denver at 303/969-2071.

Sincerely yours,

John R. Eadie

for James W. Pulliam, Jr.
Regional Director

cc:
Jellell Harper, Chief
Air Enforcement Branch
Air, Pesticides and Toxic Management Division
U.S. EPA, Region 4
345 Courtland Street, NE.
Atlanta, Georgia 30365

A. Hanks
C. Holladay
B. Thomas, SW Dist
CHF/BA/PL
P. Laval, K&A

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AGRICO
Division of Freeport-McMoRan Resource Partners

Agrico Chemical Company
P. O. Box 1110
Mulberry, FL 33860
(813) 428-1431

RECEIVED
MAR [illegible] 1992
Division of Air
Resources Management

March 19, 1992

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Preston Lewis
Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Re: Comments on Draft Permits
AC53-201152 and AC53-199112 (PSD-FL-179)

Dear Mr. Lewis:

The following comments are submitted on the proposed permits referenced above. In addition, we also submit proof of publication of the Notice of Intent to Issue Permits associated with this project.

1. Permit No. AC53-201152:
Molten Sulfur Storage and Handling System

   a) A typographical error concerning the storage capacity of the truck pit should be corrected to reflect 670 ST instead of 600 ST in the project description on page 1 of the above permit.

   b) We feel the language of Specific Condition No. 8 is overly broad and, as a practical matter, would require Agrico to notify the Department of routine maintenance and/or replacement of equipment with identical specifications. We suggest the notification be triggered by any change which would reasonably be expected to result in an increase in emissions.

2. Permit No. AC53-199112:
Sulfuric Acid Plants Nos. 10 and 11

   A typographical error concerning the sulfuric acid production rate should be corrected in Specific Condition No. 7 on page 6 from TPH to TPD.

AGRICO
Division of Freeport-McMoRan Resource Partners

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

CERTIFIED
P 670 516 058
MAIL

U.S.POSTAGE
$2.52

Mr. Preston Lewis
Florida Department of Environmental
Regulation
2600 Blair Stone Road
Tallahassee, FL 32399-2400

We also request the wording in Specific Condition No. 7 be amended to allow adequate time to troubleshoot and fine tune the plants to achieve the permitted production rates. The following language is suggested:

> The compliance tests shall be conducted at 90 to 100% of the permitted capacity (2430-2700 TPD sulfuric acid production) and within 60 days after operating the plant at a rate above 2200 TPD. The Department's Southwest District office shall be notified in writing 15 days prior to source testing. Written reports of the tests shall be submitted to that office within 45 days of test completion.

Our experience has shown us that operational adjustments and fine tuning efforts of complex processes such as the production of sulfuric acid, are not immediate and in some instances may require extended operation to be realized or the desired effect to be evaluated. We anticipate the 60-day compliance test requirement will allow adequate time to achieve normal, stable operation at the higher permitted rate. The 60-day test requirement also conforms to the minimum federal requirements in 40 CFR 60.8(a) regarding performance testing.

Prior to shutdown of the plants for the installation of new equipment, we will continue to operate under the existing operating permits for Unit 10 and 11, Permit Nos. AO53-176685 and AO53-145510, respectively. These permits allow production to exceed 2000 TPD for each plant as long as the hourly emission limits at the 2000 TPD rate are met. The 2200 TPD rate would be indicative of a production rate achievable only after the proposed plant modifications.

We feel the amended language of Specific Condition No. 7 would allow adequate time to achieve normal operation at the higher production rates and also address the Department's concern of operation for an extended period of time after achieving stable production rates without conducting performance tests.

We appreciate your consideration of these comments and request they be included in the final permit. As always, if you have any questions, please do not hesitate to call.

Sincerely,

Phillip A. Steadham
Environmental Superintendent

PAS/fbb

xc: Dr. John Koogler (Koogler & Associates)
Mr. Pradeep Raval (Koogler & Associates)
Mr. S. L. Presnell
Mr. K. W. Watkins
Mr. R. A. Woolsey
N. Hanfs
C. Holladay
B. Thomas, SW Dist
J. Harper, EPA
C. Shaver, NPS

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KA 261-91-01

February 28, 1992

RECEIVED
MAR 0 2 1992
Division of Air
Resources Management

Mr. John Bunyak
National Park Service
12745 W. Alameda Parkway
Lakewood, CO 80228

Subject: Agrico MESOPUFF Modeling

Dear Mr. Bunyak:

As per your request, enclosed are MESOPUFF model runs for all sources and Agrico by itself using only the Gaussian distribution option. Please insert these runs into the package sent to you earlier as Option Zero.

As you are well aware, it is critical that this information be reviewed as soon as possible. Your prompt response will be greatly appreciated. We urge that you convey your comments to the staff at FDER in Tallahassee who are also involved with the review of this project.

If you have any questions, do not hesitate to give us a call.

Very truly yours,

KOOGLER & ASSOCIATES

Pradeep A. Raval

PAR:wa
Enc.

c: Mr. Cleve Holladay, FDER
Mr. Selwyn Presnell, Agrico

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KA 261-91-01

February 27, 1992

Mr. C. H. Fancy
Florida Department of
Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Subject: Agrico Chemical Company
Polk County, Florida
Modification of No. 10 and No. 11
Sulfuric Acid Plants
FDER File No. AC53-199112 and PSD-FL-179

Dear Mr. Fancy:

Attached is the supplemental information on Agrico's impact on air quality related values for your review.

It is our understanding that all the information necessary to process the above permit has been submitted. We would appreciate your prompt review.

If you have any questions, please do not hesitate to contact me.

Very truly yours,

KOOGLER & ASSOCIATES

John B. Koogler

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

JBK:wa
Enc.

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Division of Air
Resources Management

c: Mr. John Vimont, National Park Service
Mr. Tom Rogers, FDER
Mr. Cleve Holladay, FDER
Mr. Selwyn Presnell, Agrico

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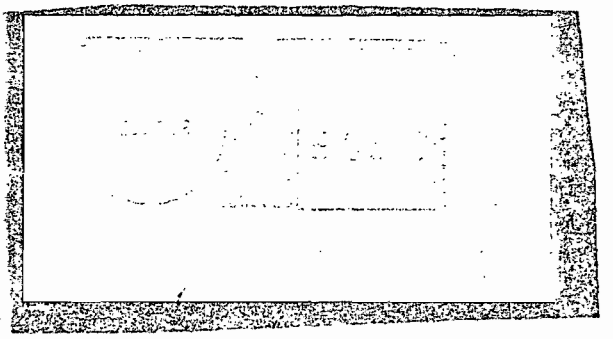

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ENVIRONMENTAL SERVICES

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TO: Mr. C. H. Fancy
Florida Department of
Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

FIRST CLASS MAIL

IMPACT OF PROPOSED AGRICO CHEMICAL COMPANY PROJECT ON AIR QUALITY RELATED VALUES

The Agrico Chemical Company, a producer of phosphate fertilizer products in Polk County, Florida, is proposing to undertake a project to increase the recovery efficiency of two existing sulfuric acid plants. Associated with the installation of a heat recovery system and electric power generating turbines is a production rate increase of the two sulfuric acid plants from 2000 tons per day to 2700 tons per day of 100% sulfuric acid, each plant. This production rate increase will result in a nominal increase in sulfur dioxide emissions of 233 pounds per hour and a nominal increase of sulfuric acid mist emissions of nine pounds per hour.

In the permit application submitted to the Florida Department of Environmental Regulation for this project, the impact of these emission increases on air quality related values within an area of significant impact of the emissions was addressed. The analysis addressed herein extends the review of the impact of increased emissions on air quality related values to the Chassahowitzka Class I PSD area; an area in excess of 120 kilometers northwest of the Agrico facility.

Air quality modeling with the MESOPUFF 2.0 air quality model indicates that the Class I area impact of sulfur dioxide emission increases expected at the Agrico facility will, at a maximum, be in the range of 0.2 - 0.4 micrograms per cubic meter, 24-hour average, depending upon the technical options incorporated in the MESOPUFF model. The impact of 0.4 micrograms per cubic meter, maximum 24-hour average, results with no technical

options employed while the impact of 0.2 micrograms per cubic meter, maximum 24-hour average, is predicted when technical options accounting for dry deposition, chemical transformation and wet removal are employed. While not specifically modeled with the MESOPUFF model, maximum annual and 3-hour sulfur dioxide impacts resulting from the proposed project at Agrico were estimated to be 0.03 micrograms per cubic meter and 1.0 micrograms per cubic meter, respectively, in the Chassahowitzka area.

Impact on Vegetation

The response of vegetation to air pollutants is influenced by the concentration of the pollutant, the duration of the exposure and the frequency of the exposure. The pattern of exposure expected from a single facility is that of a few episodes of relatively high concentrations interdispersed with long periods of no exposure or extremely low concentrations. This is the pattern of exposure that would be expected from sulfur dioxide and acid mist emissions from the Agrico facility at Chassahowitzka; with the estimated highest sulfur dioxide impact as estimated in the preceding paragraph.

Vegetation responds to a dose of an air pollutant with a dose being defined as the product of the concentration of the pollutant and the duration of the exposure. The impact of the Agrico emissions on Chassahowitzka regional vegetation was assessed by comparing pollutant doses that have been projected with air quality modeling to threshold doses reported in the literature.

Sulfur dioxide damage to vegetation can be grouped into two general categories: acute and chronic. Acute damage is caused by short-term exposure to relatively high concentrations of sulfur dioxide. This damage is usually characterized by a yellowing of leaf tips with a sharp, well defined separation between the damaged and healthy areas of a leaf. In pine trees, injury usually first occurs at the base of the youngest needles (the newest tissue on the plant).

Damaged plants typically show decreased growth and yield. These effects vary widely between species but studies have shown a rough correlation between the loss and yield and the exposure dose. These studies showed approximately a 10 percent yield loss for each 10-fold increase in sulfur dioxide dose beyond 260 micrograms per cubic meter-hour. By comparison, the maximum expected 3-hour impact of increased emissions from the Agrico facility would result in a sulfur dioxide dose increase in the range of three micrograms per cubic meter-hour and the maximum expected 24-hour impact would result in a sulfur dioxide dose increase in the range of seven micrograms per cubic meter-hour.

Susceptibility to acute damage varies widely with plant species and also with the time of exposure. For example, alfalfa can tolerate 3250 micrograms per cubic meter for one hour (3250 micrograms per cubic meter-hour dose), but only 1850 micrograms per cubic meter for two hours (3700 micrograms per cubic meter-hour dose). Table 1 shows the sulfur dioxide concentration/time thresholds for several plant species common to Florida.

TABLE 1

CONCENTRATION - TIME EXPOSURES TO
SULFUR DIOXIDE RESULTING IN DAMAGE TO
SEVERAL SPECIES COMMON TO FLORIDA

Sensitive Plants

Popular	Radish	Cabbage
Lombardy Popular	Cucumber	Broccoli
Black Willow	Squash	Spinach
Elm	Bean	Wheat
American Elm	Pea	Begonia
Southern pines	Soybean	Zinnia
Red Oak	Cotton	Rubber plant
Black Oak	Eggplant	Bluegrass
Sumac	Celery	Ryegrass

Intermediate Plants

Basswood	Yellow Popular	Virginia creeper
Red Oxier Dogwood	Sweetgum	Rose
Maples	Locust	Hibiscus
Red Maple	Eastern Cottonwood	Gladiolus
Elm	Saltgrass	Honeysuckle
Pine	Cucumber	Wisteria
White Oak	Tobacco	Chrysanthemum
Pin Oak	Potato	

Tolerant Plants

Juniper	Pine	Gardenia
Ginkgo	Sumac	Citrus
Dogwood	Cantaloupe	Celery
Oak	Corn	
Live Oak	Lily	

TABLE 1 (CONTINUED)

Exposure Time, Hours	Concentration Needed to Produce Injury ($\mu g/m^3$)		
	Sensitive	Intermediate	Tolerant
0.5	2,620 - 10,480	9,170 - 31,440	>26,200
1.0	1,310 - 7,860	6,550 - 26,200	>20,960
2.0	655 - 5,240	3,930 - 19,650	>15,720
4.0	262 - 2,620	1,310 - 13,100	>10,480
8.0	131 - 1,310	524 - 6,550	> 5,240

The vegetation in the Chassahowitzka area is characterized by flatwoods, brackish-water, marine and halothytic terrestrial species. Predominant tree species are slash pine, laurel oak, sweet gum and palm. Other plants in the area include needlegrass rush, seashore saltgrass, marsh hay and red mangrove.

A study of the tolerance of native Florida species to sulfur dioxide (Woltz and Howe, 1981) demonstrated that cypress, slash pine, live oak and mangrove exposed to 1300 micrograms per cubic meter of sulfur dioxide for 8-hours were not visibly damaged. This is consistent with the results reported in Table 1. Another table (McLaughlin and Lee, 1974) demonstrated that approximately 20 percent of a broad range of plants ranging from sensitive to tolerant were visibly injured when exposed to a sulfur dioxide concentration of 920 micrograms per cubic meter for a 3-hour period.

Acute injury results from a plants inability to quickly convert absorbed sulfur dioxide into the sulfate ion; an essential nutrient to plants. Chronic injury, on the other hand, results from a build-up of sulfate in tissue to the point where it becomes toxic. This sulfate build-up occurs over a relatively long period of time. Symptoms include a reduction in chlorophyll production resulting in decreased photosynthesis and yellow or reddish areas on leaves in a mottled pattern. In pines, sulfate injury is typically shown first at tips of older needles (the oldest tissue in the needle).

Chronic injury can result from sulfur dioxide exposures that are much lower than is required for acute injury. Unfortunately, there is a lack of quantitative experimental data for long term effects of sulfur dioxide exposure. The lowest average concentration for which chronic injury has been shown is 80 micrograms per cubic meter. The Environmental Protection Agency has therefore established an ambient air quality standard of 80 micrograms per cubic meter, annual average. The Florida Department of Environmental Regulation adopted a more conservative standard of 60 micrograms per cubic meter, annual average. By comparison, the impact of the sulfur dioxide emission increase proposed by Agrico will result in an ambient impact in the Chassahowitzka area in the range of 0.03 micrograms per cubic meter, annual average.

The maximum expected concentrations of acid mist in the Chassahowitzka area resulting from the increased emissions from Agrico will be less than four percent of the expected sulfur dioxide impacts. Furthermore, it would be expected that by the time acid mist droplets have traveled the 120 kilometers from Agrico to the Chassahowitzka area, the droplets would have reacted with particles in the atmosphere to produce a sulfate salt.

Salt deposition concentrations in coastal areas are in the range of 25-300 pounds per acre per year and may be as high as 4000 pounds per acre per year on exposed shorelines. Sulfates can account for 5 - 6 percent of the total salt; resulting in a deposition rate in the range of 1-200 pounds per acre per year.

One study (Mulchi Armbruster, 1975) demonstrated leaf damage in reduced yields in corn and soybeans with a salt deposition of 169 - 339 pounds per acre per year. Another study (Curtis, 1975) reported that broad leaf plants absorbed greater amounts of salt than do pines, probably due to leaf shape. It has been found that deciduous trees begin to exhibit adverse effects to salt exposure concentrations in the range of 100 micrograms per cubic meter (DeVine, 1975). The same study reported no observed injury to plants with long-term exposures to salt spray of 40 micrograms per cubic meter.

The sulfate concentrations resulting from acid mist emissions from Agrico are well below concentrations which have been reported to produce vegetation damage.

Impact on Soils

The major soil classification in the Chassahowitzka area is Weeki Wachee-Durbin muck. This is an euic, hyderthermic typic sufihemist that is characterized by high levels of sulfur and organic matter. This soil is flooded daily with the advent of high tide and the pH ranges between 6.1 and 7.8. The upper level of this soil may contain as much as four percent sulfur (USDA, 1991).

Based upon the maximum expected sulfur dioxide and sulfate concentrations in the Chassahowitzka area resulting from the increased emissions from Agrico, it is not expected that there will be a significant increase in the sulfur content of the native soils.

Impacts on Wildlife

As the predicted sulfur dioxide levels are below those known to cause affects to vegetation, the increased sulfur dioxide and acid mist emissions increases from Agrico are not expected to have any impact on the wildlife in the Chassahowitzka area.

Visibility Impairment Analysis

Visibility impairment analysis could be performed to determine potential visibility effects of the proposed Agrico project in the Chassahowitzka area. A screening approach suggested by EPA (Workbook for Plume Visual Impact Screening and Analysis, 1988) and computerized in a model referred to as VISCREEN could be used for the analysis.

In reviewing the applicability of the VISCREEN model, it was found that the sulfur dioxide and acid mist emission increases from Agrico are not required as model inputs because the distance from Agrico to the Chassahowitzka area is less than 200 kilometers (Chapter 3 of the VISCREEN users manual). The Class I visibility impairment analysis required by FDER and federal rules are limited to Class I areas within 100 kilometers of a source.

In view of the limitations of the VISCREEN model and the state and federal PSD regulations, no visibility impact analysis was deemed necessary for this project for the following reasons:

1. The distance from Agrico to the Chassahowitzka area is greater than 100 kilometers but less than 200 kilometers,

2. The VISCREEN model is not sensitive to sulfur dioxide emission for source-receptor distances less than 200 kilometers, and

3. The maximum sulfur dioxide impact of the Agrico project in the Chassahowitzka area is expected to be in the 0.3 micrograms per cubic meter range, 24-hour average.

REFERENCES

Curtis, C.R., L.R. Krusbert, T.L. Lauver, and B.A. Francis. 1975. Chalk Point Cooling Tower Project: Field Research on Native Vegetation. Maryland Water Resources Research Center. Maryland Department of Natural Resources - Power Plant Siting Program. p.107.

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Woltz, S.S. and T.K. Howe, 1981. Effects of Coal Burning Emissions on Florida Agriculture. In: The Impact of Increased Coal Use in Florida. Interdisciplinary Center for Aeronomy and (other) Atmospheric Sciences. University of Florida, Gainesville, Florida.

BEST AVAILABLE COPY

NOx BACT

Best Available Control Technology (BACT) Determination
International Minerals & Chemical Corporation
Polk County

The applicant has installed a dual train diammonium phosphate (DAP) plant with each train capable of producing 125 tons per hour. This (No. 2) DAP plant utilizes a dryer that was designed to be fired with either No. 6 fuel oil or natural gas.

The plant was permitted in 1980 under PSD construction permit PSD-FL-034 for a nitrogen oxides emission rate of 4.3 pounds per hour (0.21 pounds per million Btu heat input) for each of the two 70 tons per hour DAP trains. By letter dated February 27, 1985, EPA modified the nitrogen oxide emission limiting standard to allow a total plant nitrogen oxides emission rate of 8.6 pounds per hour or 0.21 pounds per million Btu heat input.

On May 29, 1985, nitrogen oxides emission measurements were made on the No. 2 DAP plant dryer to demonstrate compliance with the permitted emission limiting standard. The testing, which was performed while operating the dryer on No. 6 fuel oil, resulted in an average nitrogen oxides emission rate of 0.71 pounds per million Btu heat input. Subsequent nitrogen oxides emissions measurements on the No. 2 DAP plant showed nitrogen oxides emissions ranging from 0.80 to 0.88 pounds per million Btu heat input.

In accordance with this finding, the applicant completed a review of the plant operating practices and the dryer burner design, and concluded that there were no practical modifications that could be made to reduce nitrogen oxides emissions to the permitted emission rate of 0.21 pounds per million Btu heat input.

For permitting purposes, the applicant has proposed that the nitrogen oxides limit for the No. 2 DAP plant be set at 1.0 pound of nitrogen oxides (expressed as nitrogen dioxide) per million Btu heat input. At a maximum plant operation rate of 140 tons of DAP per hour and a design heat input rate of 0.3 million Btu per ton of DAP, the proposed limit of 1.0 pound of nitrogen oxides per million Btu heat input will result in a nitrogen oxides emission increase of 151.8 tons per year. The annual increase exceeds the 40 tons per year significant emission increase defined in 17-2.500(2)(e)2 FAC; thus requiring a PSD review and hence a BACT determination for the requested action.

BACT for NOx

Review Group Members:

This determination was based upon comments received from the applicant and the Stationary Source Control Section.

PERMITTEE:
International Minerals &
Chemical Corporation

Permit Number: AC 53-118671
Expiration Date: December 31, 1987

SPECIFIC CONDITIONS:

A, or other methods as approved by the department. Compliance tests shall be conducted prior to the expiration date of this construction permit or within 45 days after placing a plant in operation. P_2O_5 input, pH of the scrubber solution, and pressure drop across the scrubbers will be as normally operated and reported, along with the data and results, to the department. The department (SW District) shall be notified 15 days prior to any compliance test.

10. An application for permit to operate the No. 2 DAP plant shall be submitted to the department (SW District) within 45 days of the compliance tests. In the event the application for permit to operate does not include test data on both trains of the No. 2 DAP plant, the permittee shall request the District amend any permit to operate that may be issued for this plant within 45 days of placing the other train in operation.

11. Any permit to operate issued for the No. 2 DAP plant shall require annual tests for particulate matter and fluoride, and on renewal of the permit to operate (every 5 years), tests for sulfur dioxide and nitrogen oxides.

Issued this 21 day of April 1987

STATE OF FLORIDA DEPARTMENT OF
ENVIRONMENTAL REGULATION

Dale Twachtmann

Dale Twachtmann, Secretary

____ pages attached

$60.00 and 28.4 pounds/hour respectively. By comparison, the cost of using natural gas to dry 125 tons of product would compute to $56.34 and an emission rate of 4.7 pounds/hour when using the data submitted by the applicant. This calculation clearly shows that the applicant should be operating on natural gas both from the standpoint of reducing operating costs and emissions.

In addition to the data submitted, which served as the basis for the computations above, the applicant has submitted data which indicates that with proper operation the DAP dryer can be fired with No. 6 fuel oil at a lower throughput per ton of product resulting in a lower emission rate. During discussions with the bureau, the applicant has indicated that the dryer can be operated with a maximum emissions rate not to exceed 0.60 pounds per million Btu when operating at maximum production for one train (125 tons per hour). The data submitted indicates that the cost to operate at this level would be $44.57 with a corresponding emission rate of 12.7 pounds/hour. At this level of operation the incremental costs of switching to natural gas would be $1.47 per pound ($2,940.00/ton) of nitrogen oxides controlled which would indeed be unreasonable in comparison to the guideline of $1,000.00/ton of nitrogen oxides controlled for establishing NSPS. It should be noted that the cost of switching to natural gas only results in a change of operating costs, capital investment is not required to modify the facility to use natural gas as fuel. Based on this evaluation, the applicant's proposal of accepting a limitation of 0.60 pounds, per million Btu is justified.

Environmental Impacts Analysis

Dispersion modeling completed by the applicant indicates that the nitrogen oxides emissions at the originally permitted rate (0.21 pounds/million Btu) result in an ambient concentration level of 0.16 ug/m^3. The proposal to increase the emission rate to 1.0 pound per million Btu would increase the ambient concentration level by approximately 0.5 ug/m^3 for a total of 0.62 ug/m^3. This increase in the nitrogen oxides impact as originally proposed is insignificant in comparison to the maximum existing NO_2 level in urban Hillsborough County of 54 ug/m^3 and the Ambient Air Quality Standard (AAQS) of 100 ug/m^3. Based on the impacts analysis, the proposed emission rate and certainly the counter proposal of 0.6 pounds per million Btu, which would reduce the ambient impacts by a factor of 2, would not constitute a problem from an ambient concentration level standpoint.

Conclusion

In view of the fiscal condition of the phosphate fertilizer industry and the other information presented in the preceeding analysis, the bureau has determined that nitrogen oxides emission

limitation of 0.60 pounds/million Btu is justified in all respects as being BACT for this facility.

From an economic standpoint, the firing of No. 6 fuel oil at the 0.60 lb/MMBtu level does not justify switching to natural gas. In addition, the cost of having the applicant perform modifications to the burner/combustion chamber is not justified during a period when the market price of the applicant's product (DAP) is below the cost of production.

In terms of environmental impacts, it has been shown that the emissions limit, as proposed and as agreed to as being BACT, will be minimal.

It is important to note that the level of emissions determined to be BACT in this analysis is subject to change if deemed necessary in accordance with modifications that may be proposed in the future. At that time, the BACT determination would again be completed on a case-by-case basis taking into account the elements as presented herein.

Details of the Analysis May be Obtained by Contacting:

Barry Andrews, P.E., BACT Coordinator
Department of Environmental Regulation
Bureau of Air Quality Management
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Recommended by:

C. H. Fancy, P.E.
Deputy Bureau Chief, BAQM
4/16/87
Date

Approved by:

Dale Twachtmann, Secretary

21 April 87
Date

BEST AVAILABLE COPY

(b) All scientific, engineering, and technical material and other information available to the Department.

(c) The emission limiting standards or BACT determinations of any other state.

(d) The social and economic impact of the application of such technology.

The EPA currently stresses that BACT should be determined using the "top-down" approach. The first step in this approach is to determine for the emission source in question the most stringent control available for a similar or identical source or source category. If it is shown that this level of control is technically or economically infeasible for the source in question, then the next most stringent level of control is determined and similarly evaluated. This process continues until the BACT level under consideration cannot be eliminated by any substantial or unique technical, environmental, or economic objections.

BACT Determined by DER:

Control Technology	Double Absorption/Fiber Mist Eliminators
Pollutant	Emission Limits
SO_2	4.0 lb/ton of 100% H_2SO_4 produced
Sulfuric Acid Mist	0.15 lb/ton of 100% H_2SO_4 produced
Visible Emissions	10% opacity
NOx	0.12 lb/ton

BACT Determination Rationale

DER's BACT determination is the same as that proposed by the applicant (except for the addition of a NOx limit for reasons discussed in the Technical Evaluation), determinations completed by other states, and Standards of Performance for Sulfuric Acid Plants, 40 CFR 60 Subpart H, (double absorption process). The process in itself is the control technology for SO_2 and acid mist. The emission limits reflect conversion efficiency of around 99.7% of SO_2 to H_2SO_4. High efficiency mist eliminators are considered BACT for sulfuric acid mist. A review of BACT/LAER Clearinghouse indicates that the double absorption technology, and the use of high efficiency mist eliminators is representative of BACT using the top-down approach.

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
904/377-5822 ▪ FAX 377-7158

KA 261-91-01

February 24, 1992

RECEIVED
FEB 24 1992
Division of Air
Resources Management

Mr. C. H. Fancy
Division of Air Resources Management
Florida Department of
Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Subject: Agrico Chemical Company
Polk County, Florida
Modification of No. 10 and No. 11
Sulfuric Acid Plants
FDER File No. AC53-199112 and PSD-FL-179

Dear Mr. Fancy:

Following several telephone conversations with Mr. John Vimont of the National Park Service, Mr. Lou Nagler of EPA Region IV and Mr. Tom Rogers of your staff, we have completed several model runs with the MESOPUFF air quality model documenting the impact of the proposed Agrico project on the Chassahowitzka Class I PSD area. Specifically, we have made the MESOPUFF model runs to assess the impact of sulfur dioxide emission increases resulting from increasing the sulfuric acid production capacity of Agrico's No. 10 and 11 sulfuric acid plants to 2700 tons per day, each plant.

The modeling addresses the impact of all PSD increment consuming sources that have been identified in west central Florida, including the increase in emissions resulting from the proposed Agrico project. The emission inventory is one that has been reviewed by your staff, the National Park Service and is an inventory that has been approved for the modeling exercise reported herein.

The telephone discussions with John Vimont, Lou Nagler and Tom Rogers were related to the use of the technical options included in the MESOPUFF model. The model has the option of incorporating algorithms to account for the dry deposition of a pollutant, the chemical transformation of a pollutant and the wet removal of a pollutant through wet deposition and rainfall scavenging. Additionally, the model can be run with either two vertical layers or three vertical layers. With the two layer model, dry deposition is assumed to deplete a pollutant throughout the mixing layer. With the three layer model, dry deposition is assumed to deplete the

pollutant concentration in a 10 meter surface layer. The model further assumes a transfer of the pollutant from the mixing layer (the middle layer of the three layer model) into the surface layer.

Another option included in the model is a choice of algorithms for vertical dispersion of a pollutant. One algorithm uses the classical Gaussian dispersion algorithm which, through reflection at the ground surface and the top of the mixing layer, approaches a uniform vertical pollutant distribution at great distances from the source. The second vertical dispersion option of the model assumes a uniform vertical dispersion distribution at all distances from a source.

From my telephone conversations with John Vimont, it is my understanding that he has no objection to using the various technical options in the MESOPUFF model. Likewise, it is my understanding that Tom Rogers of your staff has no objection to using the technical options available in the model. From my conversations with Lou Nagler, it is my understanding that EPA has developed a protocol for long range transport models which discourages the use of the various technical options available in the MESOPUFF model at this time. Mr. Nagler did state, however, that EPA was primarily concerned with source-to-receptor distances of 100 kilometers or less for air quality impact analyses. As Agrico is approximately 120 kilometers from the Class I area, it falls well outside of EPA's zone of influence.

MESOPUFF model runs were made using five combinations of the technical model options as summarized in the attached table. The meteorology used with the model was for calendar year 1986 and represented surface stations at Tampa, Orlando and Gainesville, Florida. Upper air data from Tampa and West Palm Beach were also input to the model. Initially, we intended to utilize upper air data from Waycross, Georgia, to represent the northerly extent of our meteorological grid; however, we discovered an inordinate amount of missing data in this file. The exclusion of an upper air station for the northerly extent of the meteorological grid is not expected to have a significant effect on the model considering the fact that the majority of the measured PSD increment consuming sources included in the inventory are in the west central Florida area and the fact that the receptor grid is closer to the Tampa and Orlando surface stations than to the Gainesville station.

The receptors used in the model were selected to define the boundary of the Chassahowitzka Wilderness Area. A more detailed description of the receptors and other protocol used with the MESOPUFF model will be provided to your office under separate cover.

Four of the five MESOPUFF model runs that were made indicated that the 24-hour Class I PSD increment for sulfur dioxide of 5.0 microgram per cubic meter was exceeded at several receptors at the boundary of the

Chassahowitzka area under a single 24-hour set of meteorological data (Julian Day 329, 1986). The model further showed that with meteorology from Julian Day 329, 1986, the impact of the increased sulfur dioxide emissions from the proposed Agrico project was less than 0.07 micrograms per cubic meter, 24-hour average; the guideline significant impact level defined by the National Park Service. These modeling results are summarized in the attached table.

The fifth model run showed a maximum impact of all PSD increment consuming sources in the Class I area to be 3.1 micrograms per cubic meter, 24-hour average for sulfur dioxide. This impact is less than the 5.0 micrograms per cubic meter, 24-hour average sulfur dioxide increment for Class I areas.

On behalf of Agrico and in accordance with discussions in our meeting with you on February 13, 1992, I would appreciate your expeditious review of these modeling results. If there are any questions regarding these results, I would appreciate it if you will contact me by telephone to expedite our response. Your cooperation on this matter is and has been appreciated.

Very truly yours,

KOOGLER & ASSOCIATES

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

JBK:wa
Enc.

c: Mr. John Vimont, National Park Service w/modeling results
Mr. Tom Rogers, FDER, w/modeling results
Mr. Cleve Holiday, FDER
Mr. Selwyn Presnell, Agrico
B. Thomas, SW Dist
J. Harper, EPA
C. Shaver, NPS
W. Hanks

SUMMARY OF MESOPUFF AIR QUALITY MODELING ANALYSES

AGRICO CHEMICAL COMPANY, POLK COUNTY, FLORIDA
FILE NO. AC53-199112 AND PSD-FL-179

Option(1)	Impact of All Increment Consuming Sources(2)			Impact of Emissions from Proposed Agrico Project	
	24-Hr Periods with Impact >5 μg/m3 (Julian Day, 1986)	Max 24-hour Impact (μg/m3)	Number of Class I Receptors with impact >5 μg/m3	24-hour Period (Julian Day, 1986)	Max 24-hour Impact at any Class I Receptor on Julian Day (μg/m3)
Gaussian Vertical Dispersion Algorithm					
1	329	6.50	5	329	0.069
2	329	6.42	5	329	0.068
3	329	6.42	5	329	0.068
4	329	6.39	5	329	0.068
Uniform Vertical Mixing Algorithm					
5	None	3.12	None	-	-

(1) Gaussian Dispersion Algorithm used for Vertical Dispersion

Option	Technical Model Options Employed
1	Dry Deposition
2	Dry Deposition + Chemical Transformation
3	Dry Deposition + Chem Trans + Wet Removal
4	Dry Deposition + Chem Trans + Wet Removal + Three-Level Model

Uniform Mixing Algorithm used for Vertical Dispersion

Option	Technical Model Options Employed
5	Dry Deposition + Chem Trans + Wet Removal + Three-Level Model

(2) 24-Hour SO_2 Impact of all PSD increment consuming sources on Chassahowitzka Class I Area.

MESOPUFF II SOURCE INVENTORY

X (m)	Y (m)	HT (m)	DIAM (m)	VEL (m/s)	TEMP (K)	EMIS (g/s)	SOURCE DESCRIPTION
9.03	7.89	15.2	4.21	56.21	820	466.40	FPC DEBARY PROP TURBINES
8.62	7.72	15.2	4.21	56.21	820	310.90	FPC INT. CITY PROP TURBINES
8.62	7.72	15.2	7.04	32.07	881	276.10	FPC INT. CITY PROP TURBINES
6.95	7.80	97.6	4.88	23.23	442	98.40	FLORIDA CRUSHED STONE CPL
7.49	7.69	60.3	2.44	16.40	353	-50.40	CF IND. BASELINE C
7.49	7.69	60.3	2.44	17.77	353	54.60	CF IND. PROPOSED C
7.49	7.69	60.3	2.44	16.40	353	-50.40	CF IND. BASELINE D
7.49	7.69	60.3	2.44	17.77	353	54.60	CF IND. PROPOSED D
6.88	7.82	27.4	4.88	7.48	470	1.45	FLORIDA MINING & MATERIALS
6.99	7.59	149.4	7.32	19.81	342	654.70	TECO BIG BEND-UNIT 4
6.99	7.59	149.4	7.32	28.65	422	-2436.00	TECO BIG BEND-UNITS 1&2
6.99	7.59	149.4	7.32	14.33	418	-1218.00	TECO BIG BEND-UNIT 3
6.70	7.75	83.8	3.05	15.70	394	14.10	PASCO COUNTY RRF
7.40	7.74	12.3	0.40	9.20	466	0.20	EVANS PACKING
6.98	7.82	8.5	1.08	10.95	357	2.25	ASPHALT PAVERS NO. 4
6.95	7.80	12.2	1.37	10.58	377	2.25	ASPHALT PAVERS NO. 3
7.90	7.66	30.5	5.79	28.22	783	29.11	LAKELAND UTILITIES CT
7.66	7.60	61.0	2.60	14.28	350	-170.10	IMC SAP #1,2,3 BASELINE
7.66	7.60	61.0	2.60	15.31	350	182.85	IMC SAP #1,2,3 PROJECTED
7.66	7.60	60.7	2.60	15.31	350	121.90	IMC SAP #4,5 PROJECTED
7.66	7.60	36.6	1.83	20.15	319	5.54	IMC DAP
7.45	7.75	30.5	3.35	17.13	384	5.04	PROPOSED PASCO CO. COGEN.
8.38	7.89	30.5	3.35	17.13	384	5.04	PROPOSED LAKE CO. COGEN.
7.38	7.81	9.1	0.61	4.57	478	2.99	FDOC BOILER #3
7.47	7.79	10.7	1.83	8.99	327	0.82	E.R. JAHNA (LIME DRYER)
6.95	7.81	7.6	1.83	6.29	347	2.09	OMAN CONST. (ASPHALT)
6.58	7.70	12.2	3.05	6.47	339	0.23	DRIS PAVING (ASPHALT)
6.87	7.76	9.1	1.30	16.00	408	3.67	OVERSTREET PAV. (ASPHALT)
6.40	7.71	11.0	0.31	3.88	544	0.06	NEW PORT RICHEY HOSP BLR #1
6.40	7.71	11.0	0.31	3.88	544	0.03	NEW PORT RICHEY HOSP BLR #2
6.44	7.75	11.0	0.31	4.00	533	0.08	HOSP CORP OF AM BOILER #1
6.44	7.75	11.0	0.31	4.00	533	0.08	HOSP CORP OF AM BOILER #2
6.58	7.70	9.1	1.40	22.30	436	7.25	COUCH CONST-ODESSA (ASPHALT)
7.54	7.72	6.1	1.38	21.00	422	3.54	COUCH CONST-ZEPHYRHILLS (ASPHALT)
7.87	7.58	45.7	1.60	39.06	350	113.50	AGRICO PROPOSED
7.87	7.58	45.7	1.60	26.40	350	-75.60	AGRICO BASELINE
9.30	7.77	167.6	5.80	21.60	326	105.40	OUC STANTON
9.30	7.77	167.6	5.80	23.50	324	242.40	OUC STANTON

United States Department of the Interior

FISH AND WILDLIFE SERVICE
75 Spring Street, S.W.
Atlanta, Georgia
30303

TAKE PRIDE IN AMERICA

February 4, 1992

RECEIVED
FEB 7 1992
Division of Air
Resources Management

Mr. C. H. Fancy
Chief, Bureau of Air Regulation
Florida Department of
Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Dear Mr. Fancy:

We are in the process of reviewing the material you sent us regarding Agrico Chemical Company's (Agrico) PSD application to modify their South Pierce sulfuric acid production facility. The modification would allow Agrico to increase the production rate at the plant. As you know, the South Pierce facility is located 126 km northwest of Chassahowitzka Wilderness Area, a class I air quality area, administered by the Fish and Wildlife Service. Based on the concerns we expressed in comment letters for previous projects regarding potential impacts on the wilderness area, at the Florida Department of Environmental Regulation's (FDER) request, Agrico has been consulting with us regarding the class I analysis. Agrico has agreed to run MESOPUFF to evaluate increment consumption in the Chassahowitzka Wilderness Area.

We were recently contacted by Mr. Pradeep Raval, Agrico's consultant, who asked that we inform you that we are not opposed to Agrico's commencing construction on the heat recovery project associated with the PSD application. We understand that this phase of the project will not cause an increase in emissions or involve the installation of any process equipment. This letter is to notify you that we are not opposed to Agrico's request; however, we wish to make it clear that our approval of this phase of the project in no way implies that we are approving the entire project. We assume that Agrico is willing to take the risk that their application for increased production may eventually be denied. We expect that Agrico will continue to consult with us on their class I analysis, and after we have reviewed the results of their MESOPUFF modeling, we will provide further comments to you on the potential impacts of this facility on the Chassahowitzka Wilderness Area.

For your information, signatory authority for letters regarding air quality issues has recently been changed from the Assistant Regional Director for Refuges and Wildlife in Denver, Colorado, to the Regional Director of the Region in which the refuge in question is located. Future correspondence to the FDER will, therefore, come from the Atlanta Regional Office. You can continue to direct questions to our Air Quality Branch in Denver at 303/969-2071. Further questions regarding the Agrico application can be directed to Tonnie Maniero at that number.

Sincerely yours,

James W. Pulliam, Jr.
Regional Director

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
904/377-5822 ▪ FAX 377-7158

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KA 261-91-01

July 29, 1991

RECEIVED
AUG 12 1991
Division of Air
Resources Management

Mr. Willard Hanks
Florida Department of
Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Subject: Application for Modification
of Molten Sulfur System
Agrico Chemical Company
Mulberry, Florida

Dear Mr. Hanks:

Enclosed are four signed copies of the modification application and a check for $1,000 (permit application fee) for Agrico Chemical Company's molten sulfur system in Mulberry, Polk County, Florida.

If you have any questions concerning this application, please do not hesitate to contact me.

Very truly yours,

KOOGLER & ASSOCIATES

Pradeep A. Raval wa

Pradeep A. Raval

PAR:wa
Enc.

c: Mr. Phillip Steadham
W. Hanks
B. Thomas, SW Dist.

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
904/377-5822 • FAX 377-7158

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Bureau of
Air Regulation

KA 261-91-01

June 18, 1991

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JUN 28 1991
Bureau of
Air Regulation

Mr. C. H. Fancy
Florida Department of
Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Subject: Construction Permit Application
Modification of Sulfuric Acid Plants
No. 10 and 11
Agrico Chemical Company
Polk County, Florida

Dear Mr. Fancy:

Enclosed are six signed copies of the construction permit application and a check for $5,000 (permit application fee) for the modification of Agrico Chemical Company's sulfuric acid plants No. 10 and 11 in Polk County, Florida.

If you have any questions concerning this application, please do not hesitate to contact me.

Very truly yours,

KOOGLER & ASSOCIATES

Pradeep A. Raval

PAR:wa
Enc.

cc: Mr. Phillip Steadham

Willard Hanks
Clene Holladay } 7-3-91 RBM

Bill Thomas, SWD
Jewell Harper, EOA } 7-5-91 RBM

AGRICO
Division of Freeport-McMoRan Resource Partners

Agrico Chemical Company
P. O. Box 1110
Mulberry, FL 33860
(813) 428-1431

RECEIVED
JUN 28 1991
Bureau of
Air Regulation

RECEIVED
JUN 28 1991
Bureau of
Air Regulation

To Whom It May Concern:

Please be advised that the undersigned is Senior Vice President, Florida Operations, of Agrico Chemical Company, a division of Freeport-McMoRan Resource Partners Limited Partnership, with its principal office at 1615 Poydras Street, New Orleans, Louisiana 70112, hereinafter called "Agrico".

The Environmental Manager 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 T. P. Fowler

T. P. Fowler
Senior Vice President,
Florida Operations

BEST AVAILABLE COPY

[redacted]

AGRICO
Division of Freeport-McMoRan Resource Partners
Agrico Chemical Company

[redacted]

MAY 14, 1991

Pay ******5000*DOLLARS AND 00*CENTS $5,000.00

To The Order Of
FLORIDA DEPT OF ENVIRONMENTAL REGULATION
2600 BLAIR STONE ROAD
TALLAHASSEE, FL 323992405

Two Signatures Required over $10,000

FREEPORT Lawrence Graber

Chase Manhattan Bank, Syracuse, New York

[redacted]

Agrico Chemical Company
P.O. Box 1110
Mulberry, FL 33860
(813) 428-2613

BEST AVAILABLE COPY

NC 04069

Date Shipped: 6-26-91
Shipped Via: UPS
Collect ☐ Prepaid ☑

SHIP TO: Mr. C.H. Fancy
FLA Dept of Environmental Reg
Twin Towers Office BLDG
2600 BLAIR STONE RD
TALLAHASSEE FL 32399-2400

Vendor Invoice/Credit Memo:
Agrico P. O. # Reg # 020026
Account #
Shipment Requested by: PAT STRAHAM

Quantity	Unit	Description
1	EA	BOX PERM + APPLICATIONS

Shipped By: [illegible] Consignee/Common Carrier [illegible]

Reason for Shipment:

☐ Obsolete/Surplus Material
☐ Overshipment/Wrong Destination
☐ Scrap: Weight In.
☐ Other:

Vendor Action:

☐ Replacement
☐ Credit
☐ Repair
☐ See P. O. #

AGRICO
Division of Freeport-McMoRan Resource Partners

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

RECEIVED
JUN 28 1991
Division of Air Resources Management

Mr. C.H. Fancy
Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

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PSD-FL-179
AC53-199112

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

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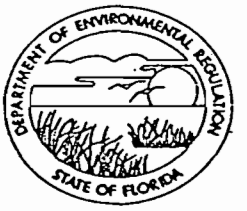
JUN 28 1991
Bureau of Air Regulation



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JUN 28 1991
Bureau of Air Regulation

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Sulfuric Acid Plant [ ] New[1] [X] Existing[1]

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

COMPANY NAME: Agrico Chemical Company COUNTY: Polk

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) Sulfuric acid plants No 10 and 11

SOURCE LOCATION: Street SR 630 City near Ft. Meade

UTM: East (17) 407.5 km North 3071.3 km

Latitude 27 ° 45 ' 52 "N Longitude 81 ° 56 ' 19 "W

APPLICANT NAME AND TITLE: Selwyn Presnell, Environmental Manager

APPLICANT ADDRESS: P.O. Box 1110, Mulberry, FL 33860

SECTION I: 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 provision of Chapter 403, Florida Statutes, and all the rules and regulations of the department and revisions thereof. I also understand that a permit, if granted by the department, will be non-transferable and I will promptly notify the department upon sale or legal transfer of the permitted establishment.

*Attach letter of authorization

Signed: Selwyn Presnell

Selwyn Presnell, Environmental Mgr.
Name and Title (Please Type)

Date: 6-25-91 Telephone No. (813) 428-1431

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

This is to certify that the engineering features of this pollution control project have been ~~designed~~/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that

[1] See Florida Administrative Code Rule 17-2.100(57) and (104)

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the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed _____

John B. Koogler, Ph.D., P.E.
Name (Please Type)

Koogler & Associates, Environmental Services
Company Name (Please Type)

4014 N.W. 13th Street, Gainesville, FL 32609
Mailing Address (Please Type)

Florida Registration No. 12925 Date: 6/18/91 Telephone No. (904) 377-5822

SECTION II: GENERAL PROJECT INFORMATION

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

See Section 3 of the attached report. Both plants will operate in full compliance with applicable regulations.

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

Start of Construction August 1991 Completion of Construction October 1992

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

No additional air pollution control equipment will be installed on the existing sulfuric acid plants.

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

See Section 2 in attached report.

E. Requested permitted equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 52 ;

if power plant, hrs/yr ____; if seasonal, describe: 8760 hrs/yr

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

1. Is this source in a non-attainment area for a particular pollutant? NO

   a. If yes, has "offset" been applied? NA

   b. If yes, has "Lowest Achievable Emission Rate" been applied? NA

   c. If yes, list non-attainment pollutants. NA

2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. YES[1]

3. Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections VI and VII. YES[1]

4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? YES[1]

5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? NO

H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source? NO

   a. If yes, for what pollutants? NA

   b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted.

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

[1]See attached PSD Report, Section 3.

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

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

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		
Sulfur	Ash	0.005	75,000	1

B. Process Rate, if applicable: (See Section V, Item 1) EACH PLANT

1. **Total Process Input Rate (lbs/hr):** 75,000 lbs/hr Sulfur
2. **Product Weight (lbs/hr):** 225,000 lbs/hr Sulfuric Acid (112.5 tph)

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

EACH PLANT

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/hr	T/yr	
SO_2	450.0	1971.0	17-2.600(2)(b)	450.0	450.0	1971.0	2
Acid Mist	16.9	74.0	17-2.600(2)(b)	16.9	169.0	740.0	2
NOx	15.8	69.2	-		15.8	69.2	2

[1]See Section V, Item 2.

[2]Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3]Calculated from operating rate and applicable standard.

[4]Emission, if source operated without control (See Section V, Item 3).

Potential acid mist emissions are based on mist eliminator efficiency of 90%.

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

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
Dual Absorption Tower	SO_2	99.7%	-	Design & Test
High Efficency	Acid Mist	90.0%	>1	Design & Test
Mist Eliminators				

E. Fuels NA

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis:

Percent Sulfur: _____ Percent Ash: _____

Density: _____ lbs/gal Typical Percent Nitrogen: _____

Heat Capacity: _____ BTU/lb _____ BTU/gal

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

_____

F. If applicable, indicate the percent of fuel used for space heating.

Annual Average NA Maximum _____

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

None

_____

_____

_____

EACH PLANT

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

Stack Height: 150 ft. Stack Diameter: 5.1 ft.

Gas Flow Rate: 157030 ACFM 131606 DSCFM Gas Exit Temperature: 170 °F.

Water Vapor Content: 0 % Velocity: 128 FPS

SECTION IV: INCINERATOR INFORMATION

NOT APPLICABLE

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

Description of Waste _____

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

Approximate Number of Hours of Operation per day _____ day/wk _____ wks/yr._____

Manufacturer_____

Date Constructed _____ Model No. _____

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

Stack Height: _____ ft. Stack Diamter: _____ Stack Temp. _____

Gas Flow Rate: _____ACFM _____ DSCFM* Velocity: _____FPS

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

Type of pollution control device: [ ] Cyclone [ ] Wet Scrubber [ ] Afterburner

[ ] Other (specify)_____

Brief description of operating characteristics of control devices: _____

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

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

SECTION V: SUPPLEMENTAL REQUIREMENTS

SEE ATTACHED REPORT

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]
   SECTION 3
2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.
   SECTION 3
3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).
   SECTION 3
4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.)
   SECTION 3
5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).
   SECTION 3
6. An 8 1/2" 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.
   SECTION 3
7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).
   SECTION 2
8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.
   SECTION 2

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation. $5,000 (similar sources)

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

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

SEE SECTION 4 OF ATTACHED REPORT

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

[ ] Yes [ ] No

Contaminant	Rate or Concentration

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

[ ] Yes [ ] No

Contaminant	Rate or Concentration

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

Contaminant	Rate or Concentration

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

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:

*Explain method of determining

5. Useful Life:

6. Operating Costs:

7. Energy:

8. Maintenance Cost:

9. Emissions:

Contaminant	Rate or Concentration

10. Stack Parameters

a. Height: ft.

b. Diameter: ft.

c. Flow Rate: ACFM

d. Temperature: °F.

e. Velocity: FPS

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

1.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

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

2.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

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

3.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

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

4.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Costs:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

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

F. Describe the control technology selected:

1. Control Device:

2. Efficiency:[1]

3. Capital Cost:

4. Useful Life:

5. Operating Cost:

6. Energy:[2]

7. Maintenance Cost:

8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

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

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

SEE SECTION 3 OF ATTACHED REPORT

A. Company Monitored Data

1. _____no. sites _____ TSP _____( ) SO^2* _____ Wind spd/dir

Period of Monitoring _____/_____/_____ to _____/_____/_____
month day year month day year

Other data recorded _____

Attach all data or statistical summaries to this application.

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

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? [ ] Yes [ ] No

b. Was instrumentation calibrated in accordance with Department procedures?

[ ] Yes [ ] No [ ] Unknown

B. Meteorological Data Used for Air Quality Modeling

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

2. Surface data obtained from (location)_____

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

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

C. Computer Models Used

1. _____ Modified? If yes, attach description.

2. _____ Modified? If yes, attach description.

3. _____ Modified? If yes, attach description.

4. _____ Modified? If yes, attach description.

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

D. Applicants Maximum Allowable Emission Data

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

E. Emission Data Used in Modeling

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

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

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

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

REPORT IN SUPPORT OF AN APPLICATION FOR A PSD CONSTRUCTION PERMIT REVIEW

PREPARED FOR:

AGRICO CHEMICAL COMPANY
SOUTH PIERCE CHEMICAL WORKS
POLK COUNTY, FLORIDA

JUNE 1991

PREPARED BY:

KOOGLER & ASSOCIATES
4014 N.W. 13TH STREET
GAINESVILLE, FLORIDA 32609
(904) 377-5822

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1.0 SYNOPSIS OF APPLICATION

1.1 APPLICANT

Agrico Chemical Company
South Pierce Chemical Works
State Road 630
P.O. Box 1110
Mulberry, Florida 33860

1.2 FACILITY LOCATION

Agrico Chemical Company, South Pierce Chemical Works (SPCW), consists of a phosphate chemical fertilizer manufacturing facility approximately eight miles west of Ft. Meade and twelve miles southwest of Bartow, Florida, on State Road 630 in Polk County. The UTM coordinates of the Agrico South Pierce facility are Zone 17, 407.6 km east and 3071.3 km north.

1.3 PROJECT DESCRIPTION

Agrico proposes to increase the sulfuric acid production rate of the two existing double absorption sulfuric acid plants from 2000 to 2700 tons per day (TPD) of 100% H2SO4 each. This will result in an increase in the sulfuric acid production rate at Agrico SPCW from the current 4,000 TPD to 5,400 TPD 100% H2SO4. The proposed project will also include energy efficiency enhancements to increase waste heat recovery.

The additional sulfuric acid produced will be used for distribution to other Agrico facilities and will not affect the operation of any other plant in the chemical complex.

The proposed project will result in a significant net increase (in

accordance with Table 500-2 of Chapter 17-2, Florida Administrative Code, FAC) in the emission rates of sulfur dioxide and sulfuric acid mist, and a less than significant increase in the emission rate of nitrogen oxides.

Agrico is submitting this report in support of the application to the Florida Department of Environmental Regulation for increasing the sulfuric acid production rates of the two existing sulfuric acid plants. The report includes a description of the existing chemical complex and the sulfuric acid plants, a review of Best Available Control Technology, an ambient air quality analysis and an evaluation of the impact of the proposed modifications on soils, vegetation and visibility.

2.0 FACILITY DESCRIPTION

Agrico Chemical Company, South Pierce Chemical Works (SPCW) consists of a phosphate chemical fertilizer manufacturing facility located on State Road 630 in Polk County, Florida (See Figures 2-1 and 2-2). The UTM coordinates of the facility are Zone 17, 407.6 km east and 3071.3 km north.

2.1 EXISTING FACILITY

The existing fertilizer complex processes phosphate rock into several different fertilizer products. This is accomplished by reacting the phosphate rock with sulfuric acid to produce phosphoric acid and then converting the phosphoric acid to fertilizer products. The chemical complex includes sulfuric acid plants, phosphoric acid plants, plants to produce purified monoammonium phosphate (MAP) and purified diammonium phosphate (DAP), a granular triple superphosphate (GTSP) plant, a silicofluorides recovery facility, and storage, handling, grinding and shipping facilities for phosphate rock, ammonia, sulfur, and fertilizer products. Figure 2-3, Plot Plan, shows the location of the existing plants.

The additional sulfuric acid produced will be used for distribution to other Agrico facilities and will not affect the operation of the other plants in the chemical complex.

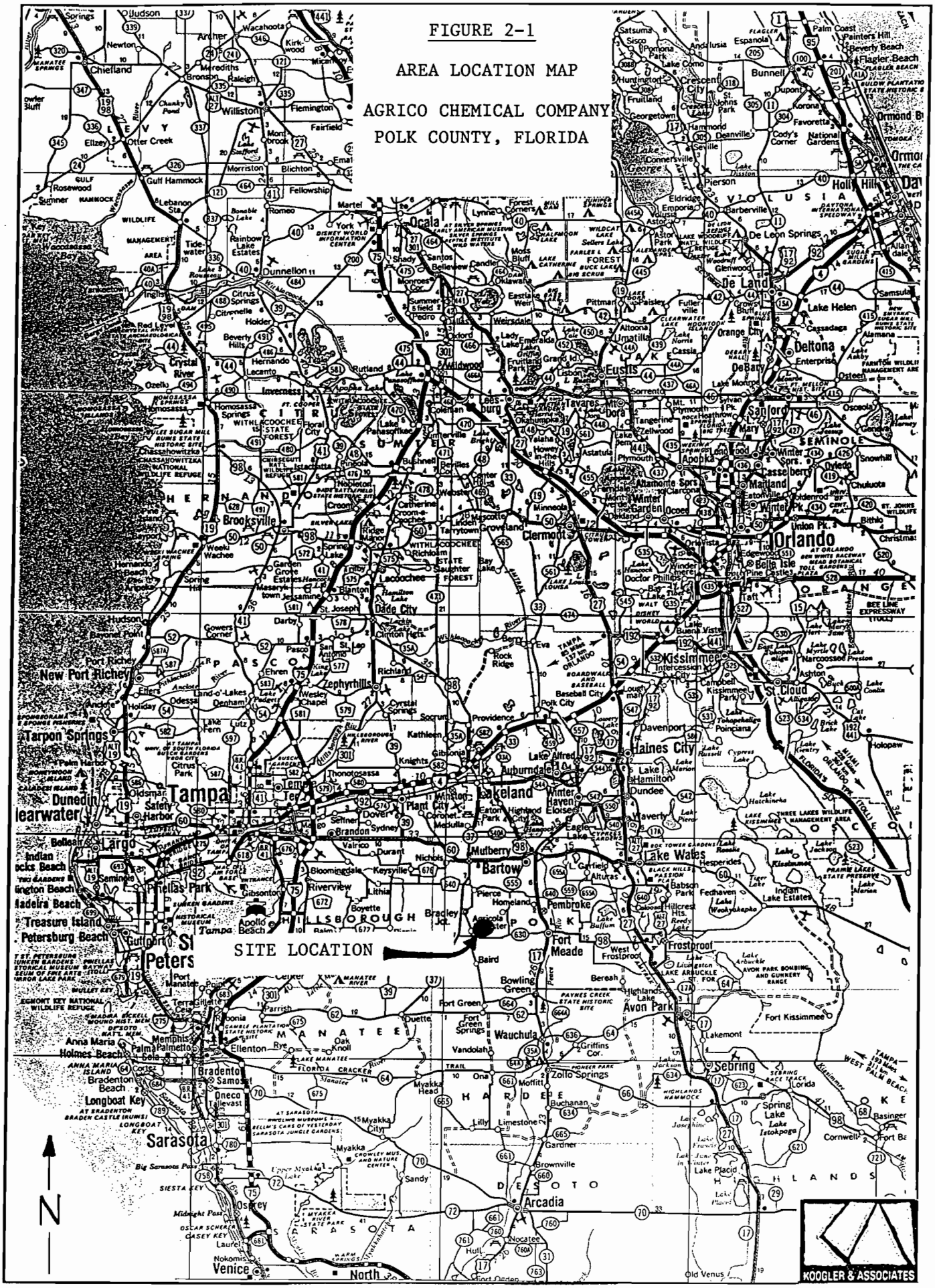
Best Available Copy

FIGURE 2-1

AREA LOCATION MAP

AGRICO CHEMICAL COMPANY

POLK COUNTY, FLORIDA



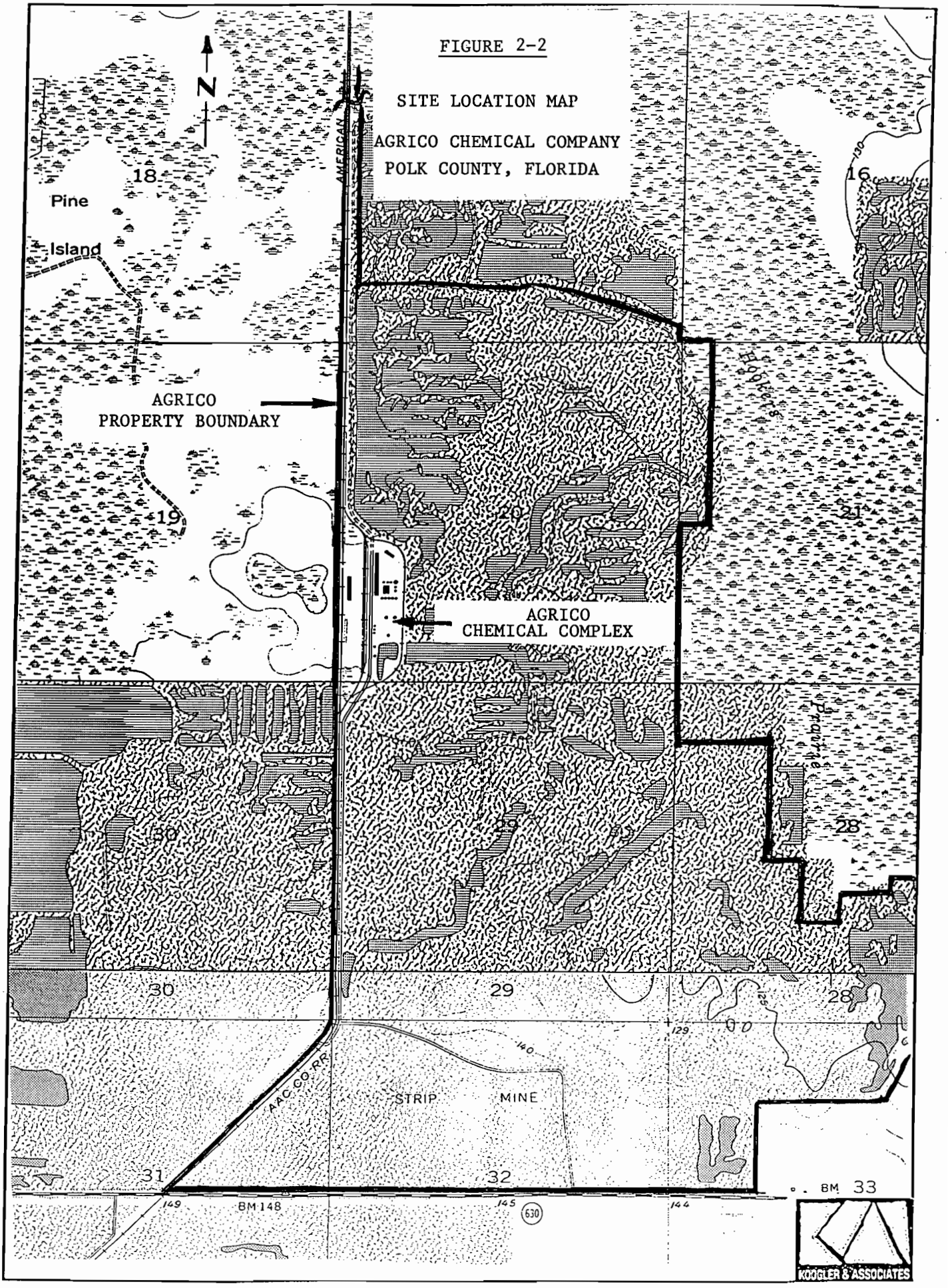


FIGURE 2-2
SITE LOCATION MAP
AGRICO CHEMICAL COMPANY
POLK COUNTY, FLORIDA
N
Pine
Island
AMERICAN
18
16
AGRICO
PROPERTY BOUNDARY
19
20
21
AGRICO
CHEMICAL COMPLEX
Prairie
30
29
28
30
29
28
140
129
A.A.C.O.R.R.
STRIP
MINE
31
32
BM 33
149
BM 148
145
630
144
KOGLER & ASSOCIATES

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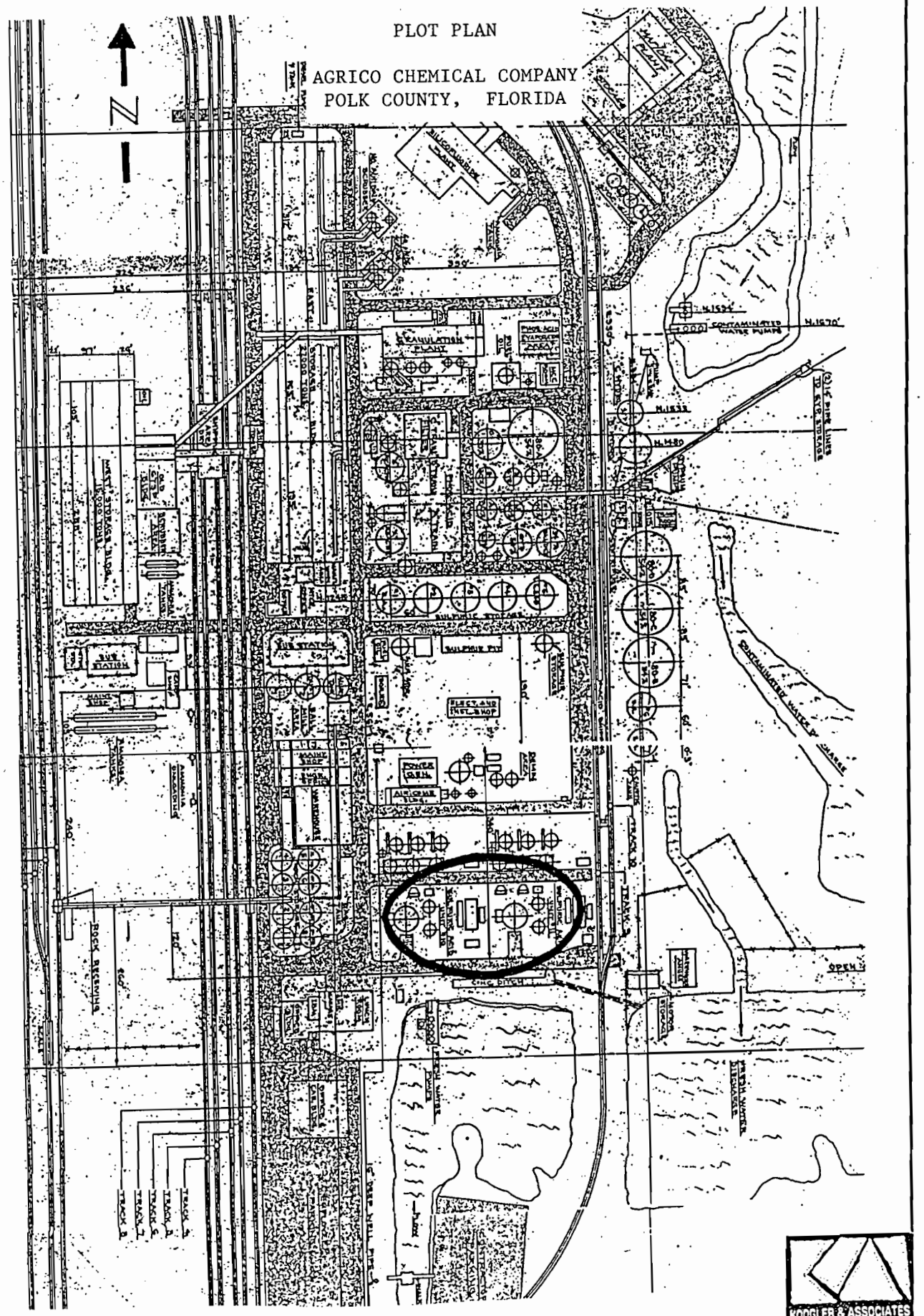
ATTACHMENT 2-3

PLOT PLAN

AGRICO CHEMICAL COMPANY
POLK COUNTY, FLORIDA



2.2 SULFURIC ACID PLANTS

There are two existing sulfuric acid plants at Agrico SPCW. Plants No. 10 and 11 were originally permitted in 1974 and are presently permitted at 2000 tons per day (TPD) of 100 percent H_2SO_4 each. Both plants are subject to Federal New Source Performance Standards as set forth in 40 CFR 60, Subpart H. The emission limiting standards for these plants are:

Sulfur Dioxide	-	4 pounds per ton of 100 percent acid
Acid Mist	-	0.15 pound per ton of 100 percent acid
Visible Emissions	-	10 percent opacity.

The State of Florida has identical emission limiting standards for new sulfuric acid plants as set forth in Rule 17-2.600(2)(b), FAC. The current FDER air permit numbers for the two sulfuric acid plants at Agrico SPCW are as follows:

Plant Number	Air Permit No.	Issue Date	Expiration Date
10	A053-176685	6-26-90	6-21-95
11	A053-145510	5-05-88	4-21-93

The total annual sulfuric acid production for 1990 was 1,455,087 tons. The sulfuric acid plant production data are presented below:

Plant Number	Production (Tons of Acid) 1989	1990
10	638,230	728,999
11	639,508	726,088

The actual emission rates of sulfur dioxide and acid mist from the sulfuric acid plants were determined from a review of emission measurements from annual compliance tests for the past five years. The actual emissions are presented in Table 2-1. The maximum measured sulfur dioxide emission rate during a compliance test was 3.6 pounds per ton of 100 percent H_2SO_4 produced and the maximum measured acid mist emission rate was 0.14 pounds per ton of 100 percent H_2SO_4 produced.

Nitrogen oxide emissions from the sulfuric acid plants were estimated by using an emission factor of 2×10^{-6} pounds of nitrogen oxides per standard cubic foot. This factor was based on an observed NOx emission rate during a performance test on a similar double absorption sulfuric acid plant.

TABLE 2-1
SULFURIC ACID PLANT EMISSION DATA

AGRICO CHEMICAL COMPANY
POLK COUNTY, FLORIDA

SUMMARY OF COMPLIANCE TEST RESULTS
SULFURIC ACID UNIT #10
PERMIT NO. A053-176685

	SO2		ACID MIST		
DATE	#/TON	#/HR	#/TON	#/HR	OPACITY
9/15/86	3.21	286.4	0.143	11.0	-0-
12/16/87	2.58	220.2	0.104	8.9	-0-
11/9/88	3.28	269.4	0.098	8.0	-0-
11/9/89	3.21	306.8	0.08	7.74	-0-
10/31/90	2.98	252.7	0.09	7.58	-0-

SULFURIC ACID UNIT #11
PERMIT NO. A053-145510

	SO2		ACID MIST		
DATE	#/TON	#/HR	#/TON	#/HR	OPACITY
1/14/86	3.47	273.4	0.128	10.07	-0-
8/26/87	3.41	264.6	0.127	9.8	-0-
5/26/88	3.56	296.4	0.102	8.5	-0-
9/5/89	3.53	297.7	0.105	8.9	-0-
8/1/90	3.41	291.4	0.121	10.3	-0-
PERMIT LIMITATION	4.0	333.3	0.15	12.5	10

3.0 PROPOSED PROJECT

3.1 PROJECT DESCRIPTION

Agrico proposes to increase the sulfuric acid production rate of the South Pierce facility from 4,000 TPD to 5,400 TPD 100% acid. The production rates of the two plants will increase from 2000 TPD to 2700 TPD 100% acid each.

The sulfuric acid production increase proposed for South Pierce is one portion of an overall cogeneration project. The project will increase South Pierce's waste heat recovery from 55% to 90%. Additional steam will be made available by significantly reducing the 600 psig steam usage in the sulfuric acid plant main blower turbines and by installing Heat Recovery Systems to produce 150 psig steam from waste heat in the interpass towers. A new turbogenerator will produce electrical power from the 600 psig and 150 psig steam thus made available.

The energy efficiency enhancements proposed also make it possible to increase each of the two sulfuric acid plant capacities from a nominal 2000 TPD to 2700 TPD. Average net new power generation will be 22 MW at 2100 TPD and 31 MW at 2500 TPD.

In addition to installing a new turbogenerator and its associated electrical equipment, the following sulfuric acid plant modifications and equipment additions will be necessary.

1. Pressure Drop Reduction

The SO_2 gas strength will be increased from 9.8% to 11.8% reducing the gas volume per unit of SO_2 and results in a lower pressure drop through the plant. The economizers before the interpass and final absorption towers cause high pressure drops and will be replaced with more efficient units. Reducing the gas pressure drop in the sulfuric acid plants lowers energy usage by the main blower turbines and makes more high pressure steam available for electrical power generation.

2. New Superheaters - Increased Steam Superheat

New superheaters will increase the temperature of the high pressure steam generated in the sulfuric acid plants from 600°F to 750°F. The steam temperature increase will improve the turbine efficiency and increase overall power generation.

3. Heat Recovery Systems

The existing interpass towers and acid coolers will be replaced with Heat Recovery Systems (HRS), proprietary technology supplied and licensed from Monsanto. This technology uses boilers to remove usable heat that is currently removed in the acid coolers. The product of these boilers is 150 psig steam which can be economically utilized to produce electrical power.

4. Increased Plant Capacity

The pressure drop reduction described above makes it possible to increase the gas flow through the sulfuric acid plant with the existing main blower turbine. Each sulfuric acid plant's production capacity can be increased from 2000 TPD nominal capacity to 2700 TPD design. The basic process is not being changed; it is being made more efficient.

The emission limits for the sulfuric acid plants will be in accordance with the Federal New Source Performance Standards and Rule 17-2.600(2)(b), FAC; i.e., the sulfur dioxide and acid mist emission limits will be 4.0 pounds per ton and 0.15 pounds per ton of 100 percent sulfuric acid, respectively. See Figure 3-1 for a flow diagram of a typical double absorption sulfuric acid plant.

Table 3-1 summarizes the permitted, actual and proposed operating characteristics of the two sulfuric acid plants. The net emission changes as a result of the proposed project are summarized in Table 3-2.

The information presented in Table 3-2 shows there will be a significant net increase in the annual emissions of sulfur dioxide and sulfuric acid mist and a less than significant increase in the annual emissions of nitrogen oxides (as defined by Table 500-2, Chapter 17-2, FAC).

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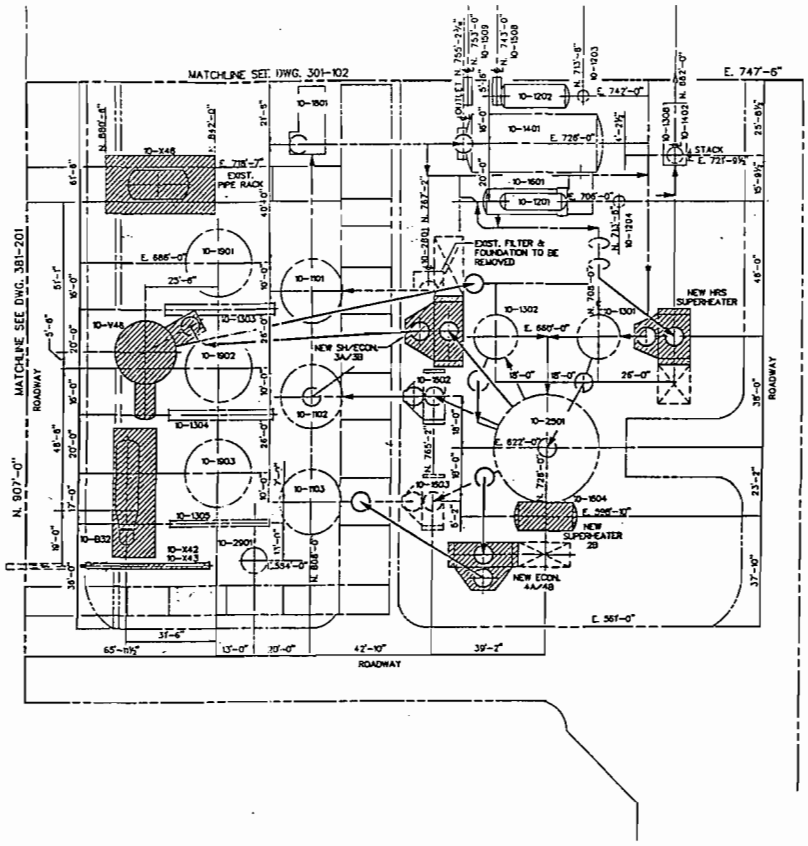

EQUIPMENT LIST
(MAJOR EQUIPMENT ONLY)

NUMBER	DESCRIPTION	REMARKS
10-1101	DRYING TOWER	(EXISTING)
10-1102	NO. 1 ABSORPTION TOWER	(REMOVE)
10-1103	NO. 2 ABSORPTION TOWER	(EXISTING)
10-1301	HEAT EXCHANGER	(EXISTING)
10-1302	HEAT EXCHANGER	(EXISTING)
10-1303	DRYING TOWER ACID COOLER	(EXISTING)
10-1304	NO. 1 ABSORPTION TOWER ACID COOLER	(REMOVE)
10-1305	NO. 2 ABSORPTION TOWER ACID COOLER	(EXISTING)
10-1602	HEAT EXCHANGER	(REMOVE)
10-1603	HEAT EXCHANGER	(REMOVE)
10-1604	SUPER HEATER	(REMOVE)
10-1901	DRYING TOWER ACID PUMP TANK	(EXISTING)
10-1902	NO. 1 ABSORPTION TOWER ACID PUMP TANK	(REMOVE)
10-1903	NO. 2 ABSORPTION TOWER ACID PUMP TANK	(EXISTING)
10-2501	CONVERTER	(EXISTING)
10-2801	AIR FILTER	(REMOVE)
	SUPERHEATER/ECONOMIZER 3A/3B	NEW
	ECONOMIZER 4A/4B	NEW
	SUPERHEATER 2B	NEW
	HRS SUPERHEATER	NEW
10-832	HRS BOILER	NEW
10-P1A/B	HP BOILER FEED WATER PUMPS	NEW - NOT SHOWN
10-P2B	HRS CIRC. PUMP	NEW - NOT SHOWN
10-P40A/B	HRS DRAIN PUMPS	NEW - NOT SHOWN
10-P41A/B	HRS BOILER FEED WATER PUMPS	NEW - NOT SHOWN
10-V48	HRS TOWER/PUMP BOOT	NEW
10-X42	HRS HEATER	NEW
10-X43	HRS PREHEATER	NEW
10-X46	HRS DEAERATOR	NEW
10-Z48	HRS DILUTER	NEW - NOT SHOWN

NOTE:
NEW EQUIPMENT IS HIGHLIGHTED WITH CROSSHATCHING

FIGURE 3-1A
PROCESS FLOW DIAGRAM

MONSANTO ENVIRO-CHEM SYSTEMS, INC.
ST. LOUIS, MISSOURI

PLANT LAYOUT
SULFURIC ACID UNIT #10
ACRICO CHEMICAL CO. SOUTH PIERCE, FL.

	BY	DATE	APPD.	DATE	JOB NO.	REVISION
DRAWN	DLM	3/91			2647	
CHECKED					DRAWING NO. 301-101	A

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PROPOSAL

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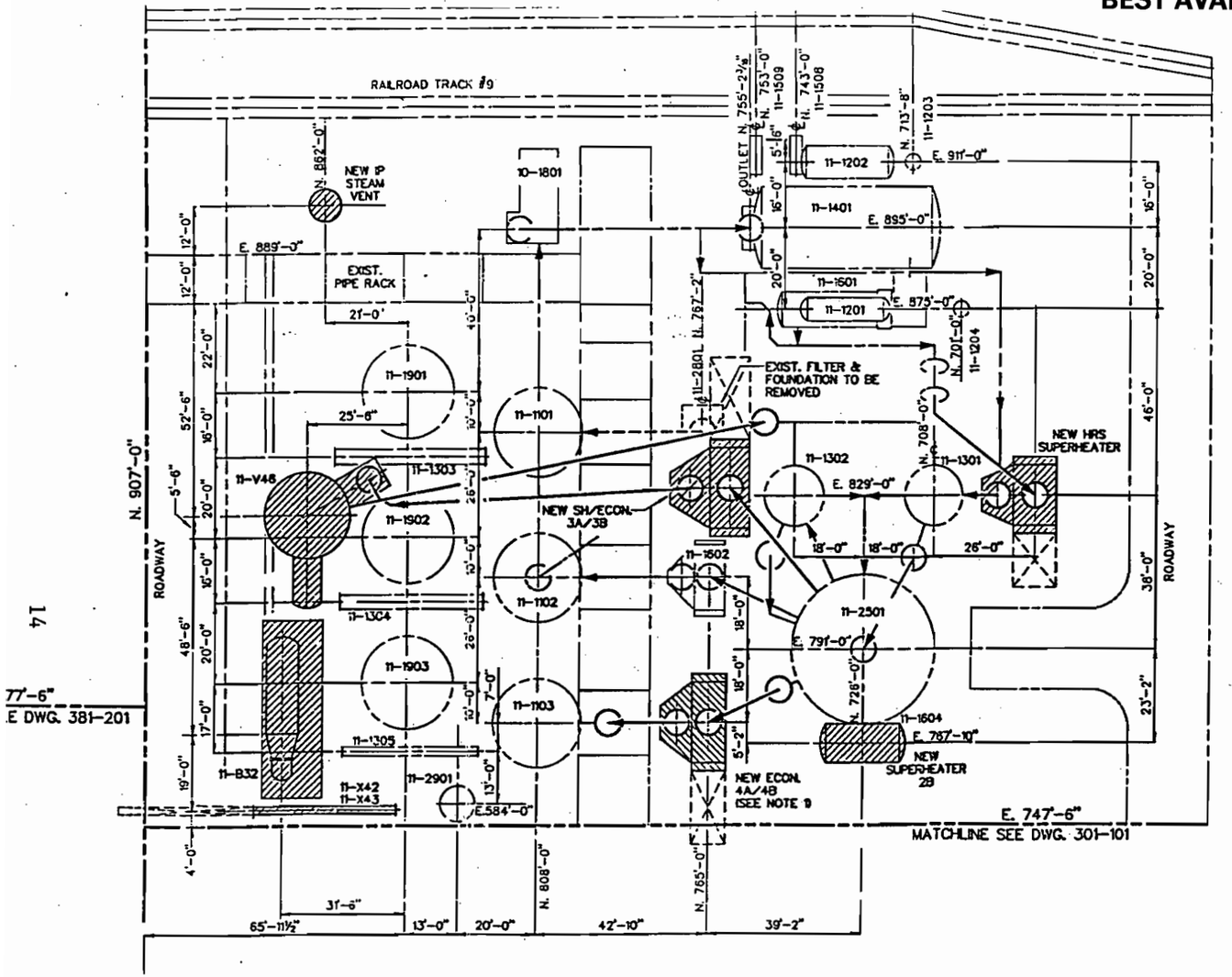

EQUIPMENT LIST
(MAJOR EQUIPMENT ONLY)

NUMBER	DESCRIPTION	REMARKS
11-1101	DRYING TOWER	(EXISTING)
11-1102	NO. 1 ABSORPTION TOWER	(REMOVE)
11-1103	NO. 2 ABSORPTION TOWER	(EXISTING)
11-1301	HEAT EXCHANGER	(EXISTING)
11-1302	HEAT EXCHANGER	(EXISTING)
11-1303	DRYING TOWER ACID COOLER	(EXISTING)
11-1304	NO. 1 ABSORPTION TOWER ACID COOLER	(REMOVE)
11-1305	NO. 2 ABSORPTION TOWER ACID COOLER	(EXISTING)
11-1602	HEAT EXCHANGER	(REMOVE)
11-1603	HEAT EXCHANGER	(REMOVE)
11-1604	SUPER HEATER	(REMOVE)
11-1901	DRYING TOWER ACID PUMP TANK	(EXISTING)
11-1902	NO. 1 ABSORPTION TOWER ACID PUMP TANK	(REMOVE)
11-1903	NO. 2 ABSORPTION TOWER ACID PUMP TANK	(EXISTING)
11-2501	CONVERTER	(EXISTING)
11-2801	AIR FILTER	(REMOVE)
	SUPERHEATER/ECONOMIZER 3A/3B	NEW
	ECONOMIZER 4A/4B	NEW
	IP STEAM VENT	NEW
	SUPERHEATER 2B	NEW
	HRS SUPERHEATER	NEW
11-B32	HRS BOILER	NEW
11-P39	HRS CIRC. PUMP	NEW - NOT SHOWN
11-P40A/B	HRS DRAIN PUMPS	NEW - NOT SHOWN
11-V48	HRS TOWER	NEW
11-X42	HRS HEATER	NEW
11-X43	HRS PREHEATER	NEW
11-Z48	HRS DILUTER	NEW - NOT SHOWN

NOTES:

1) FOUNDATION FOR THIS ECONOMIZER WILL HAVE TO BE INSTALLED DURING THE TURNAROUND.

2) NEW EQUIPMENT IS HIGHLIGHTED WITH CROSSHATCHING.

FIGURE 3-1B

PROCESS FLOW DIAGRAM

MONSANTO ENVIRO-CHEM SYSTEMS, INC.
ST. LOUIS, MISSOURI

PLANT LAYOUT
SULFURIC ACID UNIT #11
AGRICO CHEMICAL CO. SOUTH PIERCE, FL.

	BY	DATE	APP'D.	DATE	JOB NO.	REVISION
DRAWN	DLM	3/91			2647	
CHECKED					DRAWING NO.	
					PROPOSAL	

REVISIONS REVISIONS REFERENCES

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TABLE 3-1

CHANGES IN PRODUCTION AND EMISSION RATES

AGRICO CHEMICAL COMPANY
POLK COUNTY, FLORIDA

	Sulfuric Acid Plant	
	10	11
Permit Allowable Conditions		
Rate (TPD)	2000	2000
SO2 (lb/ton)	4	4
(lb/hr)	333.3	333.3
(TPY)	1460	1460
Mist (lb/ton)	0.15	0.15
(lb/hr)	12.5	12.5
(TPY)	54.8	54.8
Operating Factor	1	1
Actual Conditions		
Rate (TPD)	2000	2000
SO2 (lb/ton)	3.3	3.6
(lb/hr)	306.8	297.7
(TPY)	1343.8	1303.9
Mist (lb/ton)	0.14	0.13
(lb/hr)	11.0	10.3
(TPY)	48.2	45.1
Operating Factor	1.0	1.0
Proposed Conditions		
Rate (TPD)	2700	2700
SO2 (lb/ton)	4	4
(lb/hr)	450.0	450.0
(TPY)	1971.0	1971.0
Mist (lb/ton)	0.15	0.15
Mist (lb/hr)	16.9	16.9
(TPY)	73.9	73.9
Operating Factor	1	1

NOTE:

1. See Appendix for calculations of emission rates.
2. Sulfuric acid plants No. 10 and 11 are permitted to operate 8760 hours per year.

TABLE 3-2

NET EMISSION INCREASES(1)

AGRICO CHEMICAL COMPANY
POLK COUNTY, FLORIDA

Pollutant	Emissions (tons/yr) Sulfuric Acid Plant 10		11	
SO2				
Present (actual)	1343.8		1303.9	
Proposed	1971.0		1971.0	
Change	627.2		667.1	
Total Increase		1294.3		
Significant Increase (3)		40		
MIST				
Present (actual)	48.2		45.1	
Proposed	73.9		73.9	
Change	25.7		28.8	
Total Increase		54.5		
Significant Increase (3)		7		
NOx				
Present (actual)(2)	51.2		51.2	
Proposed(2)	69.2		69.2	
Change	18.0		18.0	
Total Increase		36.0		
Significant Increase (3)		40		

(1) See Appendix for emission calculations.
(2) NOx emissions based on emission factor of 2 x 10 -6 lb/dscf.
(3) Presented in Table 500.2, Chapter 17-2, FAC.

There are no other air pollution sources affected by the requested changes at Agrico SPCW that would have to be considered in this permit application and there are no other contemporaneous SO_2, NOx or sulfuric acid mist emission rate increases or decreases associated with this project. There have been no sources added or modified since the PSD permitting in 1981. Permitting that should be noted was the after-the-fact permit issued in 1990 by FDER for the existing molten sulfur system (current permit number A053-187290). This system has estimated SO_2 emissions of about 1.9 lbs/hr and 7.1 tpy. There will be a negligible increase in the estimated SO_2 emissions from the molten sulfur system corresponding to the increase in the molten sulfur utilization rate (addressed under seperate cover).

3.2 RULE REVIEW

The following are the state and federal air regulatory requirements that apply to new or modified sources subject to a Prevention of Significant Deterioration (PSD) review.

In accordance with EPA and State of Florida PSD review requirements, all major new or modified sources of air pollutants regulated under the Clean Air Act (CAA) are subject to preconstruction review. Florida's State Implementation Plan (SIP), approved by the EPA, authorizes the Florida Department of Environmental Regulation (FDER) to manage the air pollution program in Florida.

The PSD review determines whether or not significant air quality deterioration will result from a new or modified facility. Federal PSD regulations are contained in 40CFR52.21, Prevention of Significant Deterioration of Air Quality. The State of Florida has adopted PSD regulations which are essentially identical to the federal regulations and are contained in Chapter 17-2 of the Florida Administration Code (FAC). All new major facilities and major modifications to existing facilities are subject to control technology review, source impact analysis, air quality analysis and additional impact analyses for each pollutant subject to a PSD review. A facility must also comply with the Good Engineering Practice (GEP) stack height rule.

A major facility is defined in the PSD rules as any one of the 28 specific source categories (see Table 3-3) which has the potential to emit 100 tons per year (tpy) or more, or any other stationary facility which has the potential to emit 250 tpy or more, of any pollutant regulated under the CAA. A major modification is defined in the PSD rules as a change at an existing major facility which increases the actual emissions by greater than significant amounts (see Table 3-4).

3.2.1 Ambient Air Quality Standards

The EPA and the state of Florida have developed/adopted ambient air quality standards, AAQS (see Table 3-5). Primary AAQS protect the public health while the secondary AAQS protect the public welfare from adverse effects of air pollution. Areas of the country have been designated as attainment or nonattainment for specific pollutants. Areas not meeting

TABLE 3-3
MAJOR FACILITY CATEGORIES

AGRICO CHEMICAL COMPANY
POLK COUNTY, FLORIDA

Fossil fuel fired steam electric plants of more than 250 MMBTU/hr heat input
Coal cleaning plants (with thermal dryers)
Kraft pulp mills
Portland cement plants
Primary zinc smelters
Iron and steel mill plants
Primary aluminum ore reduction plants
Primary copper smelters
Municipal incinerators capable of charging more than 250 tons of refuse per day
Hydrofluoric acid plants
Sulfuric acid plants
Nitric acid plants
Petroleum refineries
Lime plants
Phosphate rock processing plants
Coke oven batteries
Sulfur recovery plants
Carbon black plants (furnace process)
Primary lead smelters
Fuel conversion plants
Sintering plants
Secondary metal production plants
Chemical process plants
Fossil fuel boilers (or combinations thereof) totaling more than 250 million BTU/hr heat input
Petroleum storage and transfer units with total storage capacity exceeding 300,000 barrels
Taconite ore processing plants
Glass fiber processing plants
Charcoal production plants

TABLE 3-4
REGULATED AIR POLLUTANTS - SIGNIFICANT EMISSION RATES

AGRICO CHEMICAL COMPANY
POLK COUNTY, FLORIDA

Pollutant	Significant Emission Rate tons/yr	De Minimis Ambient Impacts ug/m3
CO	100	575 (8-hour)
NOx	40	14 (NO2, Annual)
SO2	40	13 (24-hour)
Ozone	40 (VOC)	-
PM	25	10 (24-hour)
PM10	15	10 (24-hour)
TRS (including H2S)	10	0.2 (1-hour)
H2SO4 mist	7	-
Fluorides	3	0.25 (24-hour)
Vinyl Chloride	1	15 (24-hour)
	pounds/yr	
Lead	1200	0.1 (Quarterly avg)
Mercury	200	0.25 (24-hour)
Asbestos	14	-
Beryllium	0.8	0.001 (24-hour)

TABLE 3-5
AMBIENT AIR QUALITY STANDARDS

AGRICO CHEMICAL COMPANY
POLK COUNTY, FLORIDA

Pollutant	FDER (State)		USEPA (National)			
			Primary		Secondary	
	ug/m3	PPM	ug/m3	PPM	ug/m3	PPM
SO_2, 3-hour	1,300	0.5	-	-	1300	0.5
24-hour	260	0.1	365	0.14	-	-
Annual	60	0.02	80	0.03	-	-
PM10, 24-hour	150	-	150	-	150	-
Annual	50	-	50	-	50	-
CO, 1-hour	40,000	35	40,000	35	-	-
8-hour	10,000	9	10,000	9	-	-
Ozone, 1-hour	235	0.12	235	0.12	235	0.12
NO_2, Annual	100	0.053	100	-	100	-
Lead, Quarterly	1.5	-	1.5	-	1.5	-

the AAQS for a given pollutant are designated as nonattainment areas for that pollutant. Any new source or expansion of existing sources in or near these nonattainment areas are usually subject to more stringent air permitting requirements. Projects proposed in attainment areas are subject to air permit requirements which would ensure continued attainment status.

3.2.2 PSD Increments

In promulgating the 1977 CAA Amendments, Congress quantified concentration increases above an air quality baseline concentration levels for sulfur dioxide (SO_2) and particulate matter (PM/TSP) which would constitute significant deterioration. The size of the allowable increment depends on the classification of the area in which the source would be located or have an impact. Class I areas include specific national parks, wilderness areas and memorial parks. Class II areas are all areas not designated as Class I areas and Class III areas are industrial areas in which greater deterioration than Class II areas would be allowed. There are no designated Class III areas in Florida.

In 1988, EPA promulgated PSD regulations for nitrogen oxides (NOx) and PSD increments for nitrogen dioxide (NO_2) concentrations. FDER adopted the NO_2 increments in July 1990 (see Table 3-6 for PSD increments).

TABLE 3-6
PSD INCREMENTS

AGRICO CHEMICAL COMPANY
POLK COUNTY, FLORIDA

Pollutant	Allowable PSD Increments (State/National) Class I ug/m3	Class II ug/m3	Class III ug/m3
TSP, Annual	5	19	37
24-hour	10	37	75
SO2, Annual	2	20	40
24-hour	5	91	182
3-hour	25	512	700
NO2, Annual	2.5	25	50

In the PSD regulations, as amended August 7, 1980, baseline concentration is defined as the ambient concentration level for a given pollutant which exists in the baseline area at the time of the applicable baseline date and includes the actual emissions representative of facilities in existence on the applicable baseline date, and the allowable emissions of major stationary facilities which commenced construction before January 6, 1975, but were not in operation by the applicable baseline date.

The emissions not included in the baseline concentration and, therefore, affecting PSD increment consumption are the actual emissions from any major stationary facility on which construction commenced after January 6, 1975, for SO_2 and PM (TSP) and February 8, 1988, for NO_2, and the actual emission increases and decreases at any stationary facility occurring after the baseline date.

3.2.3 Control Technology Evaluation

The PSD control technology review requires that all applicable federal and state emission limiting standards be met and that Best Available Control Technology (BACT) be applied to the source. The BACT requirements are applicable to all regulated pollutants subject to a PSD review.

BACT is defined in Chapter 17-2, FAC as an emission limitation, including a visible emission standard, based on the maximum degree of reduction of each pollutant emitted which the Department, on a case-by-case basis, taking into account energy, environmental, and economic impacts, and other costs, determines is achievable through application of production

processes and available methods, systems, and techniques (including fuel cleaning or treatment or innovative fuel combustion techniques) for control of such pollutant. If the Department determines that technological or economic limitations on the application of measurement methodology to a particular part of a source or facility would make the imposition of an emission standard infeasible, a design, equipment, work practice, operational standard or combination thereof, may be prescribed instead, to satisfy the requirement for the application of BACT. Such standard shall, to the degree possible, set forth the emissions reductions achievable by implementation of such design, equipment, work practice or operation. Each BACT determination shall include applicable test methods or shall provide for determining compliance with the standard(s) by means which achieve equivalent results.

The reason for evaluating the BACT is to minimize as much as possible the consumption of PSD increments and to allow future growth without significantly degrading air quality. The BACT review also analyzes if the most current control systems are incorporated in the design of a proposed facility. The BACT, as a minimum, has to comply with the applicable New Source Performance Standard for the source. The BACT analysis requires the evaluation of the available air pollution control methods including a cost-benefit analysis of the alternatives. The cost-benefit analysis includes consideration of materials, energy, and economic penalties associated with the control systems, as well as environmental benefits derived from the alternatives.

EPA recently determined that the bottom-up approach (starting at NSPS and working up to BACT) was not providing the level of BACT originally intended. As a result, in December 1987, EPA strongly suggested changes in the implementation of the PSD program including the "top-down" approach to BACT. The top-down approach requires an application to start with the most stringent control alternative, often Lowest Achievable Emission Rate (LAER), and justify its rejection or acceptance as BACT. Rejection of control alternatives may be based on technical or economical infeasibility, physical differences, locational differences, and environmental or energy impact differences when comparing a proposed project with a project previously subject to that BACT.

3.2.4 Air Quality Monitoring

An application for a PSD permit requires an analysis of ambient air quality in the area affected by the proposed facility or major modification. For a new major facility, the affected pollutants are those that the facility would potentially emit in significant amounts. For a major modification, the pollutants are those for which the net emissions increase exceeds the significant emission rate.

Ambient air monitoring for a period of up to one year, but no less than four months, is required. Existing ambient air data for a location in the vicinity of the proposed project is acceptable if the data meet FDER quality assurance requirements. If not, additional data would need to be gathered. There are guidelines available for designing a PSD air monitoring network in EPA's "Ambient Monitoring Guidelines for Prevention

of Significant Deterioration."

FDER may exempt a proposed major stationary facility or major modification from the monitoring requirements with respect to a particular pollutant if the emissions increase of the pollutant from the facility or modification would cause air quality impacts less than the de minimis levels (see Table 3-4).

3.2.5 Ambient Impact Analysis

A source impact analysis is required for a proposed major source subject to PSD for each pollutant for which the increase in emissions exceeds the significant emission rate. Specific atmospheric dispersion models are required in performing the impact analysis. The analysis should demonstrate the project's compliance with AAQS and allowable PSD increments. The impact analysis for criteria pollutants may be limited to only the new or modified source if the net increase in impacts due to the new or modified source is below significant impact levels.

Typically, a five-year period is used for the evaluation of the highest, second-highest short-term concentrations for comparison to AAQS or PSD increments. The term "highest, second-highest" refers to the highest of the second-highest concentrations at all receptors. The second-highest concentration is considered because short-term AAQS specify that the standard should not be exceeded at any location more than once a year. If less than five years of meteorological data are used in the modeling analysis, the highest concentration at each receptor is normally used.

3.2.6 Additional Impact Analysis

The PSD rules also require analyses of the impairment to visibility and the impact on soils and vegetation that would occur as a result of the project. A visibility impairment analysis must be conducted for PSD Class I areas. Impacts due to commercial, residential, industrial, and other growth associated with the source must be addressed.

3.2.7 Good Engineering Practice Stack Height

In accordance with Chapter 17-2, FAC, the degree of emission limitation required for control of any pollutant should not be affected by a stack height that exceeds GEP, or any other dispersion technique. GEP stack height is defined as the highest of:

1. 65 meters (m), or
2. A height established by applying the formula:

   $Hg = H + 1.5\ L$

   where:

   Hg - GEP stack height,

   H - Height of the structure or nearby structure, and

   L - Lesser dimension, height or projected width of nearby structure(s)
3. A height demonstrated by a model or field study.

The GEP stack height regulations require that the stack height used in modeling for determining compliance with AAQS and PSD increments not exceed the GEP stack height. The actual stack height may be higher or lower.

3.3 RULE APPLICABILITY

The sulfuric acid production increase at Agrico SPCW is classified as a major modification to a major facility subject to both state and federal regulations as set forth in Chapter 17-2, FAC. The facility is located in an area classified as attainment for each of the regulated air pollutants. The proposed modification to the Nos. 10 and 11 sulfuric acid plants will result in significant increases in sulfur dioxide and acid mist emissions as defined by Rule 17-2.500(2)(e)2, FAC, and will therefore be subject to PSD preconstruction review requirements in accordance with FAC Rule 17-2.500. This will include a determination of Best Available Control Technology, an air quality review, Good Engineering Practice stack height analysis and an evaluation of impacts on soils, vegetation and visibility.

Although the estimated increase in the emissions of nitrogen oxides as a result of the proposed project will be less than significant, nitrogen oxides are addressed in both the Best Available Control Technology review and the Ambient Air Quality Analysis.

4.0 BEST AVAILABLE CONTROL TECHNOLOGY

Best Available Control Technology (BACT) is required to control air pollutants emitted from newly constructed major sources or from modification to the major emitting facilities if the modification results in significant increase in the emission rate of regulated pollutants (see Table 3-5 for significant emission levels).

The emission rate increases proposed by Agrico have been summarized in Table 3-2. The sulfur dioxide and sulfuric acid mist emissions increase from the proposed project will represent a significant increase while nitrogen oxides emissions will be less than significant.

Sulfur dioxide and acid mist are present in the tail gas from all contact process sulfuric acid plants. In a typical plant with a single absorption system, the sulfur dioxide in the tail gas is approximately 30 pounds per ton of acid produced and the acid mist is approximately four pounds per ton of acid produced. The nitrogen oxides that are present in the tail gas are formed in the sulfur burners as a result of the fixation of atmospheric nitrogen. Recent measurements have indicated that the concentration of nitrogen oxides in the tail gas from a sulfuric acid plant are in the range of 10 - 20 parts per million (by volume).

4.1 EMISSION STANDARDS FOR SULFURIC ACID PLANTS

Federal New Source Performance Standards (NSPS) for sulfuric acid plants became effective on August 17, 1971. These standards are codified in 40

CFR 60, Subpart H and require sulfur dioxide emissions to be limited to no more than 4.0 pounds per ton of 100 percent acid produced and require that sulfuric acid mist emissions be limited to no more than 0.15 pounds per ton of 100 percent acid produced. Additionally, the standards limit the opacity of the emissions from new sulfuric acid plants to less than 10 percent. There are no emission standards for nitrogen oxides from sulfuric acid plants.

EPA most recently reviewed the New Source Performance Standards for sulfuric acid plants in 1985 (EPA-450/3-85-012). At that time, it was concluded that because of variations in sulfur dioxide emissions as a function of catalyst age, "... the level of SO_2 emissions as specified in the current NSPS (should) not be changed at this time." Regarding the NSPS for sulfuric acid mist, EPA concluded, "Making the acid mist standard more stringent is not believed to be practical at this time because of the need to provide a margin of safety due to in-plant operating fluctuations, which introduce variable quantities of moisture into the sulfuric acid production line." There has been no change in EPA philosophy related to sulfuric acid plants since the 1985 review.

A review of BACT/LAER determinations published in the EPA Clearinghouse indicates that no new control alternatives have been applied to sulfuric acid plants as of 1990 that would result in a consistent reduction in sulfur dioxide emission below 4.0 pounds per ton of acid nor would result in a consistent reduction of sulfuric acid mist emissions below 0.15 pounds per ton of acid. No control technologies for nitrogen oxides are

discussed in either the NSPS review or in BACT/LAER determinations.

4.2 CONTROL TECHNOLOGIES

The control of sulfur dioxide and sulfuric acid mist emissions from sulfuric acid plants can be achieved by various processes. The process of choice for sulfur dioxide control has been dual absorption and the process of choice for controlling sulfuric acid mist emission has been one of the various types of fiber mist eliminators. These processes have been selected based on cost, product recovery, the formation of no undesirable by-products and the fact that neither introduces operating processes that are foreign to plant personnel.

EPA published a review of NSPS for sulfuric acid plants in March 1985 (EPA-450/3-85-012). Another review of NSPS by EPA is currently due but probably will not be published in the immediate future. In the 1985 report, EPA reviewed 46 sulfuric acid plants built between 1971 and 1985. Of these 46 plants, 40 used the dual absorption process for sulfur dioxide control with the remaining six using some type of acid gas scrubbing. All 46 plants used the high efficiency mist eliminators for acid mist control. The control of nitrogen oxides in sulfuric acid plants has not been addressed to date because of the low concentration of nitrogen oxides in the tail gases of sulfuric acid plants. The nitrogen oxide concentration in the tail gas stream of a sulfuric acid plant has been measured in the range of 10 - 20 parts per million.

In the March 1985 review (EPA-450/3-85-012), EPA reviewed the control technologies that had been used to control sulfur dioxide and sulfuric acid mist emissions from sulfuric acid plants. The alternatives included the dual absorption process, ammonia scrubbing, sodium sulfite-bisulfite scrubbing, and molecular sieves for sulfur dioxide control and filter type mist eliminators and electrostatic precipitators for sulfuric acid mist control. A review of the EPA BACT/LAER Clearinghouse information indicated that no other control alternatives have been considered for sulfuric acid plants. No control alternatives were addressed for nitrogen oxides control in either the 1985 EPA NSPS review or in the BACT/LAER Clearinghouse.

4.2.1 Sulfur Dioxide Control

The control alternatives for sulfur dioxide have been summarized based upon information compiled by EPA in the 1985 NSPS review for sulfur acid plants. As stated earlier, EPA is due to review these standards again but will probably not publish the results of their review in the immediate future.

4.2.1.1 Dual Absorption Process

The dual absorption process has become the SO_2 control system of choice within the sulfuric acid industry since the promulgation of NSPS in 1971. Of the 46 new sulfuric acid plants constructed between 1971 and 1985, 40 employed this process for sulfur dioxide control. The process offers the following advantages over other SO_2 control technologies:

1. 99.4 percent of the sulfur is converted to sulfuric acid compared with 97.7 percent conversion with a single absorption plant followed by scrubbing;

2. there are no by-products produced;

3. there are no new operating processes that plant personnel must become familiar with;

4. the process permits higher inlet sulfur dioxide concentrations resulting in a reduction in equipment size;

5. there is no reduction in overall plant operating time efficiency; and

6. there is no increase in manpower requirements.

The dual absorption process is capable of reducing sulfur dioxide emission rates to less than 4.0 pounds per ton of acid as required by New Source Performance Standards. The information reviewed by EPA indicates that even lower sulfur dioxide emission levels occur with new catalyst but as the catalyst ages, the conversion efficiency drops and sulfur dioxide emission rates begin to approach the 4.0 pound per ton limit.

4.2.1.2 Sodium Sulfite-Bisulfite Scrubbing

Between 1971 and 1985, two sulfuric acid plants were constructed employing

sodium sulfite-bisulfite scrubbing to control sulfur dioxide emissions. One of the plants was subsequently converted to ammonia scrubbing and the second plant has never been used. As a result, sodium sulfite-bisulfite scrubbing is not considered a demonstrated sulfur dioxide control alternative.

4.2.1.3 Ammonia Scrubbing

Ammonia scrubbing uses anhydrous ammonia and water in a scrubbing system to convert sulfur dioxide to ammonium sulfate. Depending upon the market, the ammonium sulfate can be converted to a fertilizer grade product.

Five sulfuric acid plants constructed between 1971 and 1985 use ammonia scrubbing for sulfur dioxide control. The process has proved effective for reducing sulfur dioxide emissions to below 4.0 pounds per ton and also for controlling sulfuric acid mist emissions.

The major disadvantages of the ammonia scrubbing system, when compared with the dual absorption process are:

1. a waste by-product is produced unless there is a market for fertilizer grade ammonium sulfate;

2. the scrubbing system introduces a process that is foreign to sulfuric acid plant operators;

3. the scrubbing system is a high maintenance item and requires additional manpower for operation; and

4. no sulfuric acid plant size reduction benefits are achieved with the scrubbing system.

4.2.1.4 Molecular Sieves

A molecular sieve was installed at one sulfuric acid plant in Florida for sulfur dioxide control. Extensive operating problems were experienced as the molecular sieve absorbed nitrogen oxides as well as sulfur dioxide. The regeneration of these gases resulted in the formation of nitric acid within the sulfuric acid plant. The nitric acid/sulfuric acid mixture resulted in severe corrosion problems which caused the molecular sieve system to be scrapped. As a result, molecular sieves are not considered a viable alternative for sulfur dioxide control in the sulfuric acid industry.

4.2.2 Sulfuric Acid Mist Control

Control alternatives that were reviewed by EPA in the 1985 New Source Performance Standards review are summarized in the following sections.

4.2.2.1 Fiber Mist Eliminators

The 46 new sulfuric acid plants constructed between 1971 and 1985, all used the fiber type mist eliminators for sulfuric acid mist control. Operations demonstrated that these types of mist eliminators can control sulfuric acid mist emissions to less than 0.15 pounds per ton of sulfuric acid.

The mist eliminators are the choice of control for sulfuric acid mist

within the sulfuric acid industry because they require very little operation and maintenance attention and because of the small space requirement associated with these devices. The disadvantage of this type of mist eliminator is that the pressure drop across the elements varies from five to 15 inches of water; resulting in an increase in operating utility costs.

4.2.2.2 Electrostatic Precipitators

The electrostatic precipitators (ESPs) have the potential for controlling sulfuric acid mist emissions from sulfuric acid plants; however, there is no demonstrated application of ESPs. The disadvantages associated with ESPs and hence, the reason they have not been used, include the initial cost, size requirements, operating and maintenance requirements and the potential for corrosion. The advantage of the ESP is that it would operate at a low pressure drop; approximately 0.5 inches of water.

4.3 COST ANALYSIS

In reviewing the cost analyses presented in this section, it should be recognized that the two control alternatives that have been analyzed for sulfur dioxide achieved about the same degree of efficiency; i.e, there is no advantage of one system over the other from the standpoint of the level of sulfur dioxide control that can be achieved. The same holds true for the control alternatives evaluated for sulfuric acid mist; both alternatives (fiber mist eliminators and electrostatic precipitators) are capable of achieving approximately the same degree of acid mist control.

Hence, the choice of the control alternative for sulfur dioxide and the control alternative for sulfuric acid mist can be made on the basis of cost, operating familiarity and operating convenience.

In Tables 4-1 and 4-2, the capital costs and annual costs of controlling sulfur dioxide emissions by dual absorption and by ammonia scrubbing are presented. In Table 4-3 and 4-4, similar costs are presented for controlling sulfuric acid mist emissions by fiber mist eliminators and electrostatic precipitators. The cost data are based upon analyses presented in EPA-450/3-85-012 and in EPA-450/3-76-014 (Capital and Operating Costs of Selected Air Pollution Control Systems); both updated to 1991 costs. The capital recovery in the annual cost calculation is based upon a 10 percent rate of return and a 10 year equipment life.

The cost analyses demonstrate that the annual cost of the dual absorption process for sulfur dioxide is about half the annual cost for ammonia scrubbing. Similarly the annual cost for sulfuric acid mist with the fiber type mist eliminators is less than one-third the annual cost of controlling acid mist with electrostatic precipitators. As the two control alternatives for sulfur dioxide and the two control alternatives for sulfuric acid mist are capable of the same level of control, it is evident why the dual absorption and the fiber type mist eliminators have been the control alternatives of choice for sulfur dioxide and sulfuric acid mist, respectively.

TABLE 4-1

COST ANALYSIS FOR SO2 CONTROL BY DUAL ABSORPTION
2700 TPD CONTACT SULFURIC ACID PLANT

AGRICO CHEMICAL COMPANY
POLK COUNTY, FLORIDA

CAPITAL COST		
Direct		
Absorber	1,341,000	
Pumps	268,000	
Piping	402,000	
Heat Exchanger	671,000	
		$2,682,000
Indirect		
Engineering and Supervision	268,000	
Construction	215,000	
Contractor	161,000	
Contingency	322,000	
		966,000
TOTAL CAPITAL COST		$3,648,000
ANNUAL COST		
Direct		
Operating Labor and Supervision	8,000	
Maintenance Labor	7,000	
Maintenance Materials	8,000	
Utilities	2,995,000	
Catalyst	41,000	
		$3,059,000
Indirect		
OH	10,000	
Payroll	4,000	
		14,000
Capital Recovery		593,000
Insurance and Taxes		146,000
Credit for Acid Recovery		(1,150,000)
TOTAL ANNUAL COST		$2,662,000

TABLE 4-2

COST ANALYSIS FOR SO2 CONTROL BY AMMONIA SCRUBBING
2700 TPD CONTACT SULFURIC ACID PLANT

AGRICO CHEMICAL COMPANY
POLK COUNTY, FLORIDA

CAPITAL COST		
Direct		
Scrubber and Auxiliaries		$4,090,000
Indirect		
Engineering and Supervision	409,000	
Construction	327,000	
Contractor	245,000	
Contingency	491,000	
		1,472,000
TOTAL CAPITAL COST		$5,562,000
ANNUAL COST		
Direct		
Operating Labor and Supervision	540,000	
Maintenance Labor	80,000	
Maintenance Materials	95,000	
Utilities	311,000	
Chemicals	2,450,000	
		$3,476,000
Indirect		
OH	369,000	
Payroll	124,000	
		493,000
Capital Recovery		905,000
Insurance and Taxes		222,000
TOTAL ANNUAL COST		$5,096,000

TABLE 4-3

COST ANALYSIS FOR ACID MIST CONTROL BY FIBER TYPE MIST ELIMINATORS
2700 TPD CONTACT SULFURIC ACID PLANT

AGRICO CHEMICAL COMPANY
POLK COUNTY, FLORIDA

CAPITAL COST		
Direct		$ 83,000
Indirect		38,000
TOTAL CAPITAL COST		$ 121,000
ANNUAL COST		
Direct		
Utilities		$ 210,000
Indirect		
Capital Recovery	20,000	
Insurance and Taxes	5,000	
		25,000
Credit for Acid Recovery		(128,000)
TOTAL ANNUAL COST		$107,000

TABLE 4-4

COST ANALYSIS FOR ACID MIST CONTROL BY ELECTROSTATIC PRECIPITATOR
2700 TPD CONTACT SULFURIC ACID PLANT

AGRICO CHEMICAL COMPANY
POLK COUNTY, FLORIDA

CAPITAL COST		
Direct		
Collector	406,000	
Auxiliaries	140,000	
		$ 546,000
Indirect		
Engineering and Supervision	55,000	
Construction	44,000	
Contractor	33,000	
Contingency	66,000	
		198,000
TOTAL CAPITAL COST		$ 744,000
ANNUAL COST		
Direct		
Operating Labor and Supervision	23,000	
Maintenance Labor	20,000	
Maintenance Materials	40,000	
Utilities	73,000	
		$ 156,000
Indirect		
OH	25,000	
Payroll	9,000	
		34,000
Capital Recovery		121,000
Insurance and Taxes		30,000
TOTAL ANNUAL COST		$ 341,000

4.4 CONCLUSION

Based upon the analysis presented in previous sections, the dual absorption process is selected by Agrico as the control alternative for sulfur dioxide control and the fiber type high efficiency mist eliminator is selected for sulfuric acid mist control. There is no effective and demonstrated technology for controlling nitrogen oxides emissions from sulfuric acid plants.

5.0 AIR QUALITY REVIEW

The air quality review required of a PSD construction permit application potentially requires both air quality modeling and air quality monitoring. The air quality monitoring is required when the impact of air pollutant emission increases and decreases associated with a proposed project exceed the de minimis impact levels defined by Rule 17-2.500(3)(e)1, FAC or in cases where an applicant wishes to define existing ambient air quality by monitoring rather than by air quality modeling. The air quality modeling is required to provide assurance that the increases and decreases in air pollutant emissions associated with the project, combined with all other applicable air pollutant emission rate increases and decreases associated with new sources affecting the project area, will not cause or contribute to an exceedance of the applicable PSD increments (defined by Rule 17-2.310, FAC). Additionally, the air quality modeling is required to provide assurance that the emissions from the proposed project, together with the emissions of all other air pollutants in the project area, will not cause or contribute to a violation of any ambient air quality standard.

The de minimis impact levels (see Table 3-4) for the air pollutants associated with the proposed project are:

Sulfur Dioxide	-	13.0 micrograms per cubic meter, 24-hour average
Sulfuric Acid Mist	-	NA

The air quality review for the proposed project included emission increases associated with the two sulfuric acid plants. The modeling associated with this review demonstrated that:

(1) the impact of sulfur dioxide emission increases would be greater than significant, but will result in no violations of the ambient air quality standards or the allowable PSD increments.

(2) the impact of sulfuric acid mist emissions is not expected to be of great concern because of the low concentrations.

Table 5-1 contains modeling input parameters used in the ambient air quality impacts analysis.

The modeling that has been conducted demonstrates that the net impact of the sulfur dioxide emissions increases addressed in this application are less than the de minimis impact levels defined by Rule 17-2.500(3)(e)1, FAC and presented in Table 3-4. Therefore, air quality monitoring is not required.

TABLE 5-1

AIR QUALITY MODELING PARAMETERS

AGRICO CHEMICAL COMPANY
POLK COUNTY, FLORIDA

H_2SO_4 Plant		Stack Ht (m)	Stack Dia (m)	Stack Gas Vel (mps)	Stack Gas Temp (°K)	Emission Rates SO_2 (g/s)	Emission Rates Acid Mist (g/s)
10	Exist.	45.7	1.6	29.37	350	-42.04	-
	Prop.	45.7	1.6	39.06	350	56.75	2.13
11	Exist.	45.7	1.6	29.37	350	-42.04	-
	Prop.	45.7	1.6	39.06	350	56.75	2.13

The air quality modeling that has been conducted demonstrates that the impact of the sulfur dioxide emission increases from the two sulfuric acid plants is significant for the 3-hour, 24-hour and annual periods, but does not result in any violations of the ambient air quality standards or the allowable PSD increments. The modeling further shows the impact of sulfuric acid mist emissions associated with the proposed project is not expected to be of great concern because of the low concentrations.

In the following sections, the air quality modeling for sulfur dioxide and sulfuric acid mist is described. Air quality modeling for nitrogen oxides is not required as the increase in nitrogen oxides emissions associated with the increased production in the sulfuric acid plants is less than 40 tons per year (less than significant emission rate increase).

5.1 AIR QUALITY MODELING FOR SULFUR DIOXIDE

As previously described, the emissions rate of sulfur dioxide used for air quality modeling purposes is the proposed maximum allowable emission rate associated with the increased sulfuric acid production rates of plant Nos. 10 and 11.

5.1.1 Area of Significant Impact

The impact analysis of the net increase in sulfur dioxide emissions was conducted using the Industrial Source Complex-Short Term (ISC-ST) air quality model, Version 90346. The Area of Significant Impact (ASI)

modeling was conducted in accordance with guidelines established by EPA and published in the document, Guideline for Air Quality Modeling, (Revised), July 1986. The meteorological data used with the model were for Tampa, Florida and represented the period 1982-1986.

The sulfur dioxide emissions modeled to determine the ASI were the net increase in emissions associated with the increases in the production rate of the two existing sulfuric acid plants. The currently permitted sulfur dioxide emissions were represented as negative inputs while the proposed sulfur dioxide emissions from the proposed project were represented as positive inputs to the model. For modeling purposes, it was assumed that the plant would operate 8,760 hours a year.

The ASI modeling included receptors established by the polar grid system extending to 12.5 kilometers from the plant. Eleven sets of receptor rings were placed at distances ranging from 0.5 to 12.5 kilometers from the plant with receptors placed at 10 degree intervals on each receptor ring. The receptor ring at 0.5 kilometers approximately corresponds to the nearest property boundary (see Figure 2-2).

The results of the ASI modeling, summarized in Table 5-2A, demonstrate that the impacts of emission increases associated with the proposed project were significant for the three-hour, 24-hour and annual time periods. The ASI modeling also demonstrated that the impacts from the proposed project were not significant beyond 12.5 kilometers (see Table 5-2B).

However, since the predicted 24-hour sulfur dioxide impacts are less than the de minimis impact level of 13 ug/m3, ambient air monitoring is not required for the proposed project.

Since the predicted sulfur dioxide impacts from the proposed project are greater than significant levels, additional modeling was conducted for sulfur dioxide for ambient air quality and PSD increment analyses. Ambient air impacts resulting from the increase in nitrogen oxides emissions can be estimated using a ratio of the sulfur dioxide impacts. The maximum predicted nitrogen oxides impact based on the ratio would be 0.03 ug/m3; less than the significant impact level of 1.0 ug/m3, annual average.

5.1.2. PSD Increment Analysis

To evaluate the PSD increment consumption, the emission rates of all sources creating a significant impact at the project site constructed or permitted after applicable baseline dates are input to the model along with emission rate reductions after the baseline dates. The impacts of these emission rate increases and decreases are then compared with the allowable PSD increments for the applicable periods of time. The list of sources creating a significant impact at the project site is provided in Table 5-3. Sulfur dioxide emitting facilities up to 200 kilometers from the site were screened using the "20 x D" rule to compile the source inventory used in the modeling.

The receptor grid chosen for the PSD increment modeling reflected the extent of Agrico's significant impact. The results of the PSD increment

modeling are presented in Table 5-4. The results show that the proposed project is not expected to cause or contribute to any violation of the allowable PSD increments.

5.1.3 Ambient Air Quality Standard Analysis

Ambient air quality standards (AAQS) have been established for several criteria pollutants to protect the health and welfare of the general public. Modeling was conducted to estimate the maximum impacts from all the sulfur dioxide emitting sources creating a significant impact at the project site. As mentioned earlier, the list of the facilities modeled, provided in Table 5-3, was compiled using the "20 x D" rule.

The receptor grid chosen for the AAQS modeling reflected the extent of Agrico's area of significant impact. Background levels for sulfur dioxide were assumed to be zero. This assumption was made since all the sulfur dioxide emitting facilities within several kilometers of the project site are permitted and documented in the FDER air pollutant inventory system which was used to compile the emission inventory used in the air modeling. Using background levels in the analysis would have resulted in double-counting.

The results of the AAQS modeling are summarized in Table 5-5. The results show that the maximum impacts from all the sources modeled are not expected to violate the sulfur dioxide AAQS.

TABLE 5-2A

SUMMARY OF SULFUR DIOXIDE SIGNIFICANT IMPACT ANALYSIS

AGRICO CHEMICAL COMPANY
POLK COUNTY, FLORIDA

METEOROLOGICAL DATA	SULFUR DIOXIDE IMPACT (ug/m^3)		
	ANNUAL	3-HOUR	24-HOUR
1982	0.71	35.47	9.33
1983	0.53	36.81	8.51
1984	0.71	37.72	8.71
1985	0.91	40.17	7.69
1986	1.12	39.12	9.87
Significant Impact (17-2.100(171)(a),FAC	1.0	25.0	5.0
De minimis Impact 17-2.500(3)(e)1,FAC	NA	NA	13.0

TABLE 5-2B

AREA OF SIGNIFICANT IMPACT FOR SULFUR DIOXIDE

AGRICO CHEMICAL COMPANY
POLK COUNTY, FLORIDA

METEOROLOGICAL DATA	IMPACTS DISTANCE (METERS) ANNUAL	3-HOUR	24-HOUR
1982	NSI	3,000	7,500
1983	NSI	5,000	7,500
1984	NSI	3,000	12,500
1985	NSI	5,000	10,000
1986	2,000	3,000	7,500

NOTE: NSI - No significant impact by Agrico's proposed project.

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TABLE 5-3

20-D TABLE (407.5, 3071.5 Agrico South Pierce) State of Florida SO2 Source Emissions

Plant Name	County	UTM Coordinates East (m)	UTM Coordinates North (m)	Total Emiss. (TPY) SO2	Dist (Km)	20-D Rule Emissions (TPY)	Significant for SO2
ADAMS PACKING	POLK	421700	3104200	40	36	713	NO
AGRICO S. PIERCE	POLK	407500	3071500	3498	0	0	YES
AJAX PAVING	CHARLOTTE	378100	2977300	58	99	1974	NO
ALAD CONSTRUCTION	OSCEOLA	455300	3127100	249	73	1466	NO
ALCOMA PACKING	POLK	451600	3085500	328	46	925	NO
ALL CHILDRENS HOSPITAL	PINELLAS	338100	3071600	44	69	1388	NO
AMERICAN ASPHALT	ORANGE	444800	3158200	53	94	1888	NO
AMERICAN ORANGE CORP	HARDEE	429800	3047300	198	33	658	NO
AMOCO OIL	HILLSBOROUGH	357800	3092000	166	54	1075	NO
APAC-FLORIDA (MACASPHALT)	LEE	424300	2930200	66	142	2846	NO
APAC-FLORIDA (MACASPHALT)	COLLIER	429200	2898800	46	174	3481	NO
APAC-FLORIDA (MACASPHALT)	CHARLOTTE	387900	2988900	132	85	1698	NO
ASPHALT DEVELOPERS	CHARLOTTE	400700	2977600	85	94	1883	NO
ASPHALT PAVERS	HERNANDO	361400	3168400	198	107	2146	NO
ATLANTIC SUGAR	PALM BEACH	553300	2945000	571	193	3861	NO
BERRY GROVES	HENDRY	450600	2955100	245	124	2482	NO
BETTER ROADS OF LAKE PLACID	COLLIER	432500	2889700	94	184	3670	NO
BETTER ROADS	COLLIER	422000	2899400	52	173	3454	NO
BETTER ROADS OF LAKE PLACID	HIGHLANDS	465600	3008700	169	86	1711	NO
BETTER ROADS OF LAKE PLACID	DESOTO	412000	3005000	59	67	1333	NO
BREWER CO OF FLORIDA	POLK	413000	3086200	75	16	314	NO
BRISSON ENTERPRISES	LEE	417600	2945000	53	127	2538	NO
CENTRAL POWER & LIME	HERNANDO	360000	3162500	4556	103	2053	YES
CF BARTOW	POLK	408400	3082400	5394	11	219	YES
CF PLANT CITY	HILLSBOROUGH	388000	3116000	8377	49	972	YES
CITRUS BELLE	HENDRY	456400	2905400	220	173	3463	NO
CITRUS HILL	POLK	447900	3068300	410	41	811	NO
CITRUS SERVICE	HERNANDO	364200	3158300	51	97	1940	NO
CITRUS WORLD	POLK	441000	3087300	877	37	741	YES
CITY ELECTRIC SYSTEM	MONROE	449400	2729200	34	345	6897	NO
CLM CHLORIDE METALS		361800	3088300	731	49	974	NO
COASTAL FUELS MARKETING	MANATEE	346500	3057800	30	63	1250	NO
COLUMBUS CO		361900	3077800	167	46	921	NO
CONSERVE NICHOLS	POLK	398700	3084200	1582	15	309	YES
CONSOLIDATED MINERALS	HILLSBOROUGH	393800	3096300	817	28	567	YES
COUCH CONSTRUCTION	HILLSBOROUGH	362100	3096700	59	52	1038	NO
COUCH CONSTRUCTION	PASCO	340700	3119500	158	82	1645	NO
CRYSTAL RIVER QUARRIES	CITRUS	340500	3205300	146	150	2993	NO
DELTA ASPHALT	HILLSBOROUGH	372100	3105400	51	49	980	NO
DES LITTLE & SONS	PASCO	333400	3133100	274	96	1927	NO
E R JAHNA INDUSTRIES	GLADES	470600	2965300	40	124	2471	NO
EVANS		383300	3135800	2178	69	1374	YES
EVERGLADES SUGAR	HENDRY	509600	2954200	1413	156	3110	NO
EXXON		362200	3087200	27	48	959	NO
FARMLAND GREEN BAY	POLK	409500	3080100	3825	9	177	YES
FLORIDA CRUSHED STONE	HERNANDO	360000	3162500	4007	103	2053	YES
FLORIDA KEYS ELEC COOP	MONROE	490700	2732700	197	349	6977	NO
FLORIDA MINING & MATL	HERNANDO	355900	3169100	47	110	2208	NO
FLORIDA SUGAR	PALM BEACH	550200	2950900	177	187	3737	NO
FPC ANCLOTE	PASCO	324400	3118700	118208	96	1911	YES
FPC BARTOW	PINELLAS	342400	3082600	65105	66	1321	YES
FPC BAYBORO	PINELLAS	338800	3071300	6876	69	1374	YES

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TABLE 5-3..CONTINUED

FPC CRYSTAL RIVER	CITRUS	334600	3205400	131757	152	3049	YES	
FPC HIGGINS	PINELLAS	336500	3098400	19063	76	1519	YES	
FPC OSCEOLA	OSCEOLA	446300	3126000	4374	67	1338	YES	
FPC RIO PINAR	ORANGE	475200	3156800	109	109	2178		NO
FPL AVON PARK	HIGHLANDS	451400	3050500	58	49	973		NO
FPL FT MYERS	LEE	422100	2952900	26853	119	2390	YES	
FPL MANATEE	MANATEE	367200	3054100	55143	44	878	YES	
GARDINIER	HILLSBOROUGH	362900	3082500	5480	46	919	YES	
GARDINIER MINE	POLK	415300	3063300	1173	11	226	YES	
GOLD BOND BUILDING	HILLSBOROUGH	347300	3082700	307	61	1225		NO
GULF COAST CENTER	LEE	426000	2948300	20	125	2492		NO
GULF COAST LEAD	HILLSBOROUGH	364000	3093500	1641	49	975	YES	
HARDEE POWER PLANT		404800	3057400	16081	14	287	YES	
HARPER BROTHERS	LEE	400300	2947000	47	125	2494		NO
HARPER BROTHERS	LEE	413600	2934100	98	138	2751		NO
HILLSBOROUGH RESOURCE RECOV	HILLSBOROUGH	368200	3092700	702	45	893		NO
HOLLY HILL FRUIT	POLK	441000	3115400	398	55	1104		NO
IMC LONESOME MINE	HILLSBOROUGH	389600	3067900	1547	18	365	YES	
IMC NEW WALES	POLK	396700	3079400	10561	13	268	YES	
IMC NORALYN		414700	3080300	1378	11	227	YES	
IMC PRAIRIE	POLK	402900	3087000	137	16	323		NO
INTERNATIONAL PETROLEUM	HILLSBOROUGH	389000	3098000	61	32	646		NO
JOHN CARLO FLORIDA	POLK	426200	3104100	33	38	752		NO
KEY WEST UTILITY BOARD	MONROE	419100	2716500	5741	355	7104		NO
KEY WEST UTILITY BOARD	MONROE	425700	2716700	5425	355	7105		NO
KISSIMMEE ELECTRIC	OSCEOLA	460100	3129300	1738	78	1563	YES	
LAFARGE	HILLSBOROUGH	358000	3090600	12134	53	1061	YES	
LAKELAND LARSEN	POLK	409000	3106200	3998	35	695	YES	
LAKELAND MCINTOSH	POLK	409200	3106200	30176	35	695	YES	
L D PLANTE	SEMINOLE	474500	3179200	34	127	2537		NO
MACASPHALT	SEMINOLE	470200	3175800	22	122	2434		NO
MACASPHALT	COLLIER	437900	2898700	54	175	3509		NO
MOBIL NICHOLS	POLK	398400	3085300	814	17	331	YES	
MOBIL BIG 4 MINE	HILLSBOROUGH	394700	3069600	569	13	259	YES	
MOBIL ELECTROPHOS	POLK	405600	3079400	194	8	163	YES	
MUNICIPAL SERVICE DIST	MONROE	567900	2791100	49	323	6461		NO
MUNICIPAL SERVICE DIST	MONROE	448700	2729100	33	345	6897		NO
MUNICIPAL SERVICE DIST	MONROE	518100	2745100	49	345	6893		NO
MYAKKA PROCESSORS	DESOTO	409900	3010300	108	61	1225		NO
NATIONAL LINEN SERV	LEE	417600	2945900	35	126	2520		NO
NATL GYPSUM	HILLSBOROUGH	347400	3082500	136	61	1222		NO
NITRAM		363100	3089000	108	48	954		NO
OKEELANTA CORP	PALM BEACH	524900	2940100	99	176	3524		NO
OMAN CONSTRUCTION	HERNANDO	359700	3164000	69	104	2082		NO
ORLANDO CITY SLUDGE DRYER	ORANGE	478200	3166500	22	118	2368		NO
OSCEOLA FARMS	PALM BEACH	544200	2968000	357	171	3429		NO
OVERSTREET PAVING	PASCO	355900	3134700	94	82	1632		NO
OWENS-ILLINOIS GLASS	POLK	406000	3102300	21	31	617		NO
PASCO RESOURCE RECOVERY	PASCO	347000	3139000	413	91	1813		NO
PINELLAS RESOURC RECOV	PINELLAS	335200	3084100	2300	73	1468	YES	
PLASTI-KRAFT CORP	PINELLAS	325400	3105500	66	89	1777		NO
RALSTON PURINA	ORANGE	451100	3167700	54	106	2112		NO
REEDY CREEK ENERGY	ORANGE	442000	3139000	67	76	1516		NO
REEDY CREEK ENERGY	ORANGE	443100	3144300	54	81	1621		NO
ROGERS GROUP	ORANGE	455800	3167100	38	107	2142		NO
ROYSTER MULBERRY	POLK	406900	3085100	1265	14	272	YES	
ROYSTER PINEY PT.	MANATEE	348680	3057318	1971	61	1210	YES	
SEBRING UTILITIES	HIGHLANDS	456800	3042500	137	57	1144		NO
SEBRING UTILITIES	HIGHLANDS	464300	3035400	3864	67	1346	YES	

TABLE 5-3..CONTINUED

SEMINOLE FERTILIZER	POLK	409800	3086600	8674	15	305	YES
SIMMONS CONSTRUCTION	GLADES	487800	2967700	35	131	2625	NO
SLOAN CONSTRUCTION	ORANGE	463200	3143000	20	91	1813	NO
STANDARD SAND & SILICA	POLK	441500	3118200	349	58	1155	NO
STAUFFER CHEMICAL	PINELLAS	325600	3116700	79	94	1871	NO
STILWELL FOODS	HILLSBOROUGH	389800	3098900	22	33	652	NO
SUGAR CANE GROWERS COOP	PALM BEACH	534900	2953300	4935	174	3476	YES
SULFER TERMINAL	HILLSBOROUGH	358000	3090000	103	53	1057	NO
SULPHURIC ACID TRADING	HILLSBOROUGH	349000	3081500	156	59	1187	NO
SWINDLE BROS	HENDRY	450500	2956800	38	122	2450	NO
TAMPA GENERAL HOSP	HILLSBOROUGH	356400	3091000	59	55	1094	NO
TAMPA (MCKAY) RES RECOV	HILLSBOROUGH	360000	3091900	745	52	1034	NO
TARMAC FLORIDA	HILLSBOROUGH	362800	3097000	21	51	1029	NO
TECO BIG BEND	HILLSBOROUGH	361900	3075000	364554	46	915	YES
TECO GANNON	HILLSBOROUGH	360000	3087500	126940	50	1002	YES
TECO HOOKERS PT	HILLSBOROUGH	358000	3091000	13522	53	1064	YES
THATCHER GLASS		361800	3088300	176	49	974	NO
TRICIL RECOVERY SERV	POLK	422700	3091900	240	25	509	NO
TROPICANA PRODUCTS	MANATEE	346800	3040900	36	68	1360	NO
USSAC FT. MEADE	POLK	416000	3069000	2710	9	177	YES
US SUGAR	PALM BEACH	538800	2968100	755	167	3343	NO
US SUGAR	HENDRY	505900	2956900	2155	151	3021	NO
WACHULA CITY POWER	HARDEE	418400	3047000	180	27	536	NO
WINTER GARDEN CITRUS	ORANGE	443800	3159600	145	95	1906	NO
ZELLWOOD FARMS	ORANGE	440800	3180000	101	113	2270	NO

TABLE 5-4

SUMMARY OF SULFUR DIOXIDE PSD INCREMENTS ANALYSIS

AGRICO CHEMICAL COMPANY
POLK COUNTY, FLORIDA

METEOROLOGICAL DATA	SULFUR DIOXIDE IMPACT (ug/m^3)		
	ANNUAL	3-HOUR	24-HOUR
1982	NSI*	134.80	44.33
1983	NSI	133.08	31.52
1984	NSI	123.81	37.41
1985	NSI	135.31	31.93
1986	3.17	142.25	35.84
Allowable Class II PSD Increment	20	512	91

*NSI - No significant impact by Agrico's proposed project.

TABLE 5-5

SUMMARY OF AMBIENT AIR QUALITY STANDARDS
ANALYSIS FOR SULFUR DIOXIDE

AGRICO CHEMICAL COMPANY
POLK COUNTY, FLORIDA

METEOROLOGICAL DATA	SULFUR DIOXIDE IMPACT (ug/m^3)		
	ANNUAL	3-HOUR	24-HOUR
1982	29.85	400.00	165.02
1983	31.85	436.92	145.33
1984	32.89	385.15	229.14
1985	34.71	438.84	170.82
1986	36.30	451.05	168.26
Ambient Air Quality Standard	60	1300	260

5.2 AIR QUALITY MODELING FOR SULFURIC ACID MIST

No ambient air quality standards, PSD increments or significant impact levels have been established for sulfuric acid mist and under the FDER Air Toxics Policy (January 1991) there has been no No Threat Level (NTL) established.

Air quality modeling was conducted to estimate the impact of sulfuric acid mist emissions. The predicted sulfuric acid mist air quality impacts are summarized in Table 5-6. It was estimated that because of the expected magnitude of the sulfuric acid mist emissions from other sources and the distances of these sources from Agrico, it would be very unlikely that any of the sources, individually or collectively, would result in a significant contribution to ambient acid mist levels in the project area.

The maximum predicted sulfuric acid mist impacts occur at locations which are both remote and far from the population centers. On the west side of the Agrico facility there is a large settling pond and on the east side is Hookers Prairie. Both those areas are fairly inaccessible. Furthermore, the sulfuric acid mist will be controlled by the Best Available Control Technology. As a result, the sulfuric acid mist emissions are not expected to be of great concern.

TABLE 5-6

SUMMARY OF ACID MIST IMPACT ANALYSIS

AGRICO CHEMICAL COMPANY
POLK COUNTY, FLORIDA

METEOROLOGICAL DATA	24-HR ACID MIST IMPACT (ug/m^3)
1982	3.40
1983	3.17
1984	2.82
1985	3.46
1986	3.25

6.0 GOOD ENGINEERING PRACTICE STACK HEIGHT

The criteria for good engineering practice stack height in Rule 17-2.270 states that the height of a stack should not exceed the greater of 65 meters (213) feet or the height of nearby structures plus the lesser of 1.5 times the height or cross-wind width of the nearby structure. This stack height policy is designed to prevent achieving ambient air quality goals solely through the use of excessive stack heights and air dispersion.

Based on this policy, the limiting height for the two sulfuric acid plant stacks is 213 feet. Agrico's stacks are less than 213 feet in height above-grade. This will satisfy the good engineering practice (GEP) stack height criteria and will not result in excessive concentrations of air pollutants as a result of plume downwash as the stack will be at least 2.5 times the height of nearby structures. The GEP stack analysis is presented in Table 6-1.

It should be noted that when an attempt was made to consider building effects in modeling by including the rock silos, shown in Table 6-1 with H=150 feet, it was rejected by the model as "not applicable." It can be concluded from the modeling result that the rock silos do not affect the predicted air modeling impacts because the sulfuric acid plant stack height is 150 feet.

TABLE 6-1

GOOD ENGINEERING PRACTICE STACK HEIGHT ANALYSIS

AGRICO CHEMICAL COMPANY
POLK COUNTY, FLORIDA

Building	Height H ft	Length x Width ft	Projected Width PW(1) ft	L(2) ft	5L(3) ft	Distance to H2SO4 ft	H + 1.5L(4) ft
Rock Silos	60	160 x 80	127	60	300	100	150
Ball Mill	61	30 x 30	34	34	170	250	>5L
Mill Storage	45	125 x 75	109	45	225	250	>5L
Phos Acid	67	72 x 226	143	67	335	500	>5L
E. Storage	71	672 x 126	328	71	355	500	>5L
DAP	160	80 x 65	81	81	405	650	>5L
Shipping	140	29 x 52	44	44	220	700	>5L
GTSP	123	50 x 166	103	103	515	800	>5L

(1) Projected width = $(4/\pi \times \text{Building Width} \times \text{Building Length})^{\frac{1}{2}}$
(2) L is lesser of H or PW.
(3) 5L is distance the building wake effect present.
(4) H + 1.5L is stack height necessary to eliminate downwash.
(5) Structure is more than a distance of 5L from the sulfuric acid plants and will therefore exert no influence on emissions from the sulfuric acid plants.

7.0 IMPACTS ON SOILS, VEGETATION AND VISIBILITY

7.1 IMPACT ON SOILS AND VEGETATION

The U. S. Environmental Protection Agency was directed by Congress to develop primary and secondary ambient air quality standards. The primary standards were to protect human health and the secondary standards were to:

> "... protect the public welfare from any known or anticipated adverse effects of a pollutant."

The public welfare was to include soils, vegetation and visibility.

As a basis for promulgating the air quality standards, EPA undertook studies related to the effects of all major air pollutants and published criteria documents summarizing the results of the studies. The studies included in the criteria documents were related to both acute and chronic effects of air pollutants. Based on the results of these studies, the criteria documents recommended air pollutant concentration limits for various periods of time that would protect against both chronic and acute effects of air pollutants with a reasonable margin of safety.

The air quality modeling that has been conducted as a requirement for the PSD application demonstrates that the levels of sulfur dioxide expected at the Agrico SPCW site, as a result of the operation of Agrico and all facilities expected to have an impact at the project site, will be well below both primary and secondary air quality standards. As a result, it is reasonable to conclude that there will be no adverse effect to the soils, vegetation or visibility of the area. In the following paragraphs,

the surrounding areas are discussed and related to the expected concentrations of air pollutants for the area.

The Agrico property and the surrounding areas are comprised of mining lands (phosphate), flatwoods, marshes, and sloughs. The soils of the area are primarily sandy and are typically low in both clay and silt content. These characteristics and the semi-tropic climatic factors of high temperature and rainfall are the natural factors which determine the terrestrial communities of the region.

The land in the vicinity of Agrico supports various plant communities. The vegetation can be divided into upland and wetland categories. In each category, the following major formations have been identified:

Upland	Wetland
Pine flatwoods	Cypress swamp
Oak Scrub	Shrub swamp
Sandhill	Marsh

Much of the natural vegetation on the site and the surrounding areas has been altered due to mining and industrial use; primarily the phosphate fertilizer industry. As a result of mining and industrial activity, there is very little undisturbed land in existence in the vicinity of the Agrico facility.

In most areas, the soils encountered are coarse and contain increasing amounts of silt and clays until they contact the phosphate rock deposits.

Soils in areas of low relief are influenced by flatwood vegetation, high water tables and organic or mineral pan of varying thickness. Mucks are found in the lower physiographic areas where large amounts of plant debris have accumulated.

The soils and vegetation of the area will be exposed to Agrico's air pollutant levels when they lie downwind of the Agrico facility. The areas other than those downwind of the facility will be exposed to existing concentrations of air pollutants from other major emitting facilities in the immediate area. The results of the air modeling shows that the effects of air pollutants on plants or soils are expected primarily from the short-term higher doses or from acute effects.

Sulfur dioxide can produce two types of injury to vegetation; acute and chronic. The amount of acute injury caused by sulfur dioxide depends on the absorption rate of the gas which is a function of the concentration. Different varieties of plants vary widely in their susceptibility to sulfur dioxide injury. The threshold response of alfalfa to acute injury is 3400 micrograms per cubic meter over one hour, whereas privet requires 15 times this concentration for the same injury. Some species of trees and shrubs have shown injury at exposures of 1400 micrograms per cubic meter for seven hours, while injury has been produced in other species at three hour exposures of 1500 micrograms per cubic meter. From the various studies, it appears that acute symptoms of vegetation damage will not occur if the maximum annual concentration does not exceed 800 micrograms per cubic meter.

Chronic symptoms of sulfur dioxide exposure, including excessive leaf drop, may occur as a result of long-term exposure to lower concentrations. Such symptoms have been reported in areas where the mean annual concentration of sulfur dioxide is in the range of 80 micrograms per cubic meter.

Sulfur dioxide concentrations in the range of 270-680 micrograms per cubic meter react synergistically with either ozone or nitrogen dioxide during exposure periods of approximately four hours to produce moderate to severe injury in certain sensitive plants.

Sulfuric acid mist can cause injury as a result of the deposition of acid droplets. Such injury may occur at sulfuric acid mist concentrations in the range of 100 micrograms per cubic meter.

The effects reported in the above paragraphs have been summarized from criteria documents for sulfur dioxide, prepared by the U.S. Environmental Protection Agency. These documents further state that the sensitivity of plants is affected significantly by the plant species and environmental conditions, such as temperature, relative humidity, soil moisture, light intensity, and nutrient level.

As a comparison to the levels of sulfur dioxide that have reportedly caused vegetation damage, the maximum sulfur dioxide levels expected in the vicinity of Agrico resulting from sulfur dioxide emissions from all facilities effecting the area will be 36 micrograms per cubic meter,

annual average; 451 micrograms per cubic meter, 3-hour average; and 229 micrograms per cubic meter, 24-hour average. The concentrations of sulfur dioxide will be well below levels at which vegetation damage has been observed and well below standards that the U.S. Environmental Protection Agency has promulgated to protect human health and welfare.

The sulfur dioxide in the atmosphere reaches the soil by deposition from the air and is converted to sulfates. The sulfates that are deposited could cause a slight acidification of already acidic soils. The predicted concentrations of sulfur dioxide from stack emissions will not be at a level, however, that will result in a measurable increase in sulfates; even over a long period of time. The slight increase that could occur is not expected to have an effect on natural vegetation.

7.2 GROWTH RELATED IMPACTS

The proposed modification will require no increase in personnel to operate the sulfuric acid plants. Also, the increase in sulfuric acid production may cause a slight increase in delivery truck tanker traffic but will have a negligible impact on traffic in the area as compared with traffic levels that presently exist. Therefore, no additional growth impacts are expected as a result of the proposed project.

7.3 VISIBILITY IMPACTS

The proposed project will result in an increase in the sulfur dioxide emissions which has the potential for adverse impacts on visibility. However, EPA has noted in discussions on visibility models that the

sulfates formation resulting from sulfur dioxide emissions becomes a factor beyond 200 kilometers. Since the air modeling shows no significant sulfur dioxide impacts beyond 12.5 kilometers, it can be concluded that the proposed project is not expected to have an adverse impact on visibility in the area. Thus, it is expected that the proposed modification will not adversely impact soils, vegetation and visibility in the area.

8.0 CONCLUSION

It can be concluded from the information in this report that the proposed increase in production rates of sulfuric acid plants No. 10 and 11 as described in this report will not cause or contribute to a violation of any air quality standard, PSD increment, or any other provision of Chapter 17-2, FAC.

APPENDIX

EMISSION RATE CALCULATIONS

EMISSION RATE CALCULATIONS

PERMITTED CONDITIONS: (Each Plant)

SULFURIC ACID PLANTS NO. 10 AND 11

2000 tons per day 100% acid (rated capacity)
SO2 - 4.0 lbs/ton, 333.3 lbs/hr
Mist - 0.15 lb/ton, 12.5 lbs/hr
Operating Factor - 1.0
(Based on Permits No. A053-176685 and A053-145510

ACTUAL CONDITIONS:

(Emissions based on five years of compliance test results)

SULFURIC ACID PLANT NO. 10

2000 tons per day 100% acid
SO2 - 3.3 lbs/ton, 306.8 lbs/hr
Mist - 0.14 lb/ton, 11.0 lbs/hr
Operating Factor - 1.0 (Based on production data)

SULFURIC ACID PLANT NO. 11

2000 tons per day 100% acid
SO2 - 3.6 lbs/ton, 297.7 lbs/hr
Mist - 0.13 lb/ton, 10.3 lbs/hr
Operating Factor - 1.0

PROPOSED CONDITIONS: (Each Plant)

SULFURIC ACID PLANTS NO. 10 AND 11

2700 tons per day 100% acid
SO2 - 4.0 lbs/ton
Mist - 0.15 lb/ton
Operating Factor - 1.0

PERMITTED EMISSION RATE CALCULATIONS (Each Plant)

SULFURIC ACID PLANTS NO. 10 AND 11

SO2:	Hourly	=	4.0 lbs/ton x 2000/24 tons/hr
		=	333.3 lb/hr
	Annual	=	333.3 lbs/hr x 8760 hrs/yr x 1/2000 ton/lb
		=	1460.0 TPY
MIST:	Hourly	=	0.15 lb/ton x 2000/24 tons/hr
		=	12.5 lbs/hr
	Annual	=	12.5 lbs/hr x 8760 hrs/yr x 1/2000 ton/lb
		=	54.8 TPY

ACTUAL EMISSION RATE CALCULATIONS

(Emissions based on five years of compliance test results)

SULFURIC ACID PLANT NO. 10

SO2:	Hourly	=	306.8 lbs/hr
	Annual	=	306.8 lbs/hr x 8760 hr/yr x 1/2000 ton/lb
		=	1343.8 TPY
MIST:	Hourly	=	11.0 lbs/hr
	Annual	=	11.0 lbs/hr x 8760 hrs/yr x 1/2000 ton/lb
		=	48.2 TPY
NOx	Hourly	=	2000 tons/day x 70,190 dscf/ton x 2 x 10(-6) lb/dscf x 1/24 day/hr
		=	11.7 lbs/hr (NOx emission factor based on emission test data from similar source)
	Annual	=	11.7 lbs/hr x 8760 hrs/yr x 1/2000 ton/lb
		=	51.2 TPY

SULFURIC ACID PLANT NO. 11

SO2:	Hourly	=	297.7 lbs/hr
	Annual	=	297.7 lbs/hr x 8760 hr/yr x 1/2000 ton/lb
		=	1303.9 TPY
MIST:	Hourly	=	10.3 lbs/hr
	Annual	=	10.3 lbs/hr x 8760 hrs/yr x 1/2000 ton/lb
		=	45.1 TPY
NOx	Hourly	=	2000 tons/day x 70,190 dscf/ton
			x 2 x 10(-6) lb/dscf x 1/24 day/hr
		=	11.7 lbs/hr
	Annual	=	11.7 lbs/hr x 8760 hrs/yr x 1/2000 ton/lb
		=	51.2 TPY

PROPOSED EMISSION RATE CALCULATIONS: (Each Plant)

SULFURIC ACID PLANTS NO. 10 AND 11

SO2:	Hourly	=	2700 tons/day x 4.0 lbs/ton x 1/24 day/hr
		=	450.0 lbs/hr
	Annual	=	450.0 lbs/hr x 8760 hr/yr x 1/2000 ton/lb
		=	1971.0 TPY
MIST:	Hourly	=	2700 tons/day x 0.15 lbs/ton x 1/24 day/hr
		=	16.9 lbs/hr
	Annual	=	16.9 lbs/hr x 8760 hrs/yr x 1/2000 ton/lb
		=	73.9 TPY
NOx	Hourly	=	2700 tons/day x 70,190 dscf/ton
			x 2 x 10(-6) lb/dscf x 1/24 day/hr
		=	15.8 lbs/hr
	Annual	=	15.8 lbs/hr x 8760 hrs/yr x 1/2000 ton/lb
		=	69.2 TPY

NET ANNUAL EMISSION CHANGES

Total Actual SO2	=	1343.8 + 1303.9 = 2647.7 TPY
Total Proposed SO2	=	2 x 1971 = 3942.0 TPY
Net Change SO2	=	3942 - 2647.7 = 1294.3 TPY
Total Actual Mist	=	48.2 + 45.1 = 93.3 TPY
Total Proposed Mist	=	2 x 73.9 = 147.8 TPY
Net Change Mist	=	147.8 - 93.3 = 54.5 TPY
Total Actual NOx	=	2 x 51.2 = 102.4 TPY
Total Proposed NOx	=	2 x 69.2 = 138.4 TPY
Net Change NOx	=	138.4 - 102.4 = 36 TPY

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Florida Department of Environmental Regulation

Twin Towers Office Bldg. ● 2600 Blair Stone Road ● Tallahassee, Florida 32399-2400

Lawton Chiles, Governor

Carol M. Browner, Secretary

July 5, 1991

Ms. Jewell A. Harper, Chief
Air Enforcement Branch
Air, Pesticides & Toxics Management Division
U.S. EPA, Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Dear Ms. Harper:

Re: Agrico Chemical Company
PSD-FL-179

The Department has received the above referenced PSD application package. Please review this package for completeness by July 28, 1991, and forward your comments to the Department's Bureau of Air Regulation. The Bureau's FAX number is (904)922-6979.

If you have any questions, please call Messers. Willard Hanks or Cleve Holladay at (904)488-1344 or write to me at the above address.

Sincerely,

for C. H. Fancy, P.E.
Chief
Bureau of Air Regulation

CHF/rbm

Attachment

c: B. Thomas, SW District
J. Koogler, P.E., K&A
Willard Hanks
Cleve Holladay } 7-5-91 RBM

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State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

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From: _____ Date: _____

Interoffice Memorandum

To: Willard M. Hanks, Air BAR, Tallahassee

Thru: J. Harry Kerns for W.C. Thomas

From: Gary A. Maier, Air Permitting, Tampa

Date: July 23, 1991

Subject: AC53-199112, Agrico Chemical Company, Sulfuric Acid Plants #10 and #11.

Pursuant to Clair Fancy's letter dated July 5, 1991, the Southwest District Air Section reviewed the above referenced permit application. Agrico Chemical Company is proposing a project which appears to be essentially identical to a project proposed by Royster (AC41-173305, processing by Teresa Heron). The Royster application, submitted on December 1, 1989, was never made complete because the applicant failed to satisfactorily respond to questions raised by this office and Tallahassee.

The proposed process, developed by Monsanto, is different from typical sulfuric acid production plants. To our knowledge, this new process has never operated in the USA. In my opinion, the literature reports regarding the success of foreign operations are conflicting. The Southwest District Office respectfully requests BAR to ask for the following additional information in an incompletion letter to Agrico.

(1) The application does not contain process flow diagrams for the proposed modified facility. Although figures 3-1A and 3-1B purport to be process flow diagrams, they are, in actuality, plant equipment layout diagrams. Please request Agrico to submit process flow diagrams for the actual (not typical) proposed modified facility..

(2) The plant equipment layout diagrams (figures 3-1A and 3-1B) seem to indicate that drying towers will be utilized. Please ask Agrico to confirm that the drying towers will be utilized in the proposed modified facility. Utilization of the drying towers should be reflected in the process flow diagrams requested above.

(3) Please request Agrico to provide the Department with reasonable assurance that the efficiency of the converters will not be degraded while operating at the proposed new process conditions and higher process rates. The answer to this question must

(a) completely describe the process streams that each converter was originally designed to handle,

(b) completely describe the process streams that each converter will handle in the proposed modified facility, and

(c) explain why the differences between (a) and (b) will not degrade converter efficiency.

(4) Please request Agrico to provide the Department with reasonable assurance that the efficiency of the absorbers will not be degraded while operating at the proposed new process conditions and higher process rates. The answer to this question must

(a) completely describe the process streams that each absorber was originally designed to handle,

(b) completely describe the process streams that each absorber will handle in the proposed modified facility, and

(c) explain why the differences between (a) and (b) will not degrade absorber efficiency.

(5) Please request Agrico to provide the Department with reasonable assurance that the efficiency of the mist eliminators will not be degraded while operating at the proposed new process conditions and higher process rates. The answer to this question must

(a) completely describe the process streams that each mist eliminator was originally designed to handle,

(b) completely describe the process streams that each mist eliminator will handle in the proposed modified facility, and

(c) explain why the differences between (a) and (b) will not degrade mist eliminator efficiency.

If you have any questions, my Suncon number is 552-7612, extension 408.

DEPARTMENT OF ENVIRONMENTAL REGULATION

ROUTING AND TRANSMITTAL SLIP

ACTION NO

ACTION DUE DATE

1. TO: (NAME, OFFICE, LOCATION) WILLARD HANKS	Initial / Date
2. Bureau of Air Regulation Tallahassee	Initial / Date
3.	Initial / Date
4.	Initial / Date

REMARKS:

INFORMATION

- [ ] Review & Return
- [ ] Review & File
- [ ] Initial & Forward
- [ ]

DISPOSITION

- [ ] Review & Respond
- [ ] Prepare Response
- [ ] For My Signature
- [ ] For Your Signature
- [ ] Let's Discuss
- [ ] Set Up Meeting
- [ ] Investigate & Report
- [ ] Initial & Forward
- [ ] Distribute
- [ ] Concurrence
- [ ] For Processing
- [ ] Initial & Return

FROM: Gary Maier

DATE 7-23-91

PHONE Suncom 552-7612 ext 408

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Florida Department of Environmental Regulation

Twin Towers Office Bldg. ● 2600 Blair Stone Road ● Tallahassee, Florida 32399-2400

Lawton Chiles, Governor

Carol M. Browner, Secretary

July 26, 1991

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Selwyn Presnell, Environmental Manager
Agrico Chemical Company
P. O. Box 1110
Mulberry, Florida 33860

Dear Mr. Presnell:

Re: File No. AC 53-199112, Sulfuric Acid Plants

The Department has made a preliminary review of your application for permits to modify the Nos. 10 and 11 sulfuric acid plants at Agrico's South Pierce phosphate fertilizer chemical plant in Polk County. Before this application can be processed, the Department will need the following information:

1. What facilities will use the additional sulfuric acid produced by the modified plants? Where are these facilities located?

2. What is the maximum rating of the turbogenerator? How many MW will be generated when the acid production is 2700 TPD?

3. In order to determine whether a proposed modification will result in significant net emissions increases of regulated pollutants, the increase or decrease is quantified by using the proposed "new allowable" emissions minus the "old actual" emissions. The old actual emissions must be based on the previous two years of operating data unless some other period is deemed to be more representative of normal operating conditions. Please recalculate the changes in all regulated pollutant emissions using this criteria. It appears the project may also be subject to PSD for nitrogen oxides based on this criteria. Please provide copies of the annual operating

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reports for the sulfuric acid plants during the 2 years selected to support your actual emission calculations. Please redo the appropriate modeling analyses using the corrected input values. The Department's files also indicate that the

two sulfuric acid plants were permitted at only 1800 tons per day during the PSD SO_2 baseline year. This would impact PSD increment consumption. In addition, the existing molten sulfur system (current permit number AO 53-187290) which was permitted after-the-fact in 1990 has never been included in any modeling analysis. Emissions due to this source should be included in the appropriate modeling analyses.

4. The application does not contain process flow diagrams for the proposed modified facility. Although figures 3-1A and 3-1B purport to be process flow diagrams, they are, in actuality, plant equipment layout diagrams. Please submit process flow diagrams for the actual (not typical) proposed modified facility.

5. The plant equipment layout diagrams (figures 3-1A and 3-1B) seem to indicate that drying towers will be utilized. Please confirm that the drying towers will be utilized in the proposed modified facility. Utilization of the drying towers should be reflected in the process flow diagrams requested above.

6. Please provide the Department with reasonable assurance that the efficiency of the converters will not be degraded while operating at the proposed new process conditions and higher process rates. The answer to this question must:

   a. completely describe the process streams that each converter was originally designed to handle,

   b. completely describe the process streams that each converter will handle in the proposed modified facility, and

   c. explain why the differences between (a) and (b) will not degrade converter efficiency.

7. Please provide the Department with reasonable assurance that the efficiency of the absorbers will not be degraded while operating at the proposed new process conditions and higher process rates. The answer to this question must:

   a. completely describe the process streams that each absorber was orignially designed to handle,

   b. completely describe the process streams that each absorber will handle in the proposed modified facility, and

c. explain why the differences between (a) and (b) will not degrade absorber efficiency.

8. Please provide the Department with reasonable assurance that the efficiency of the mist eliminators will not be degraded while operating at the proposed new process conditions and higher process rates. The answer to this question must:

   a. completely describe the process streams that each mist eliminator was originally designed to handle,

   b. completely describe the process streams that each mist eliminator will handle in the proposed modified facility, and

   c. explain why the differences between (a) and (b) will not degrade mist eliminator efficiency.

9. Please submit emissions reports demonstrating compliance with F.A.C. Rule 17-2.600(2)(b) and 40 CFR 60, Subpart H, from an operating sulfuric acid plant utilizing the same Monsanto process proposed for this modified facility.

We will resume processing this application after we receive the requested information. If you have any questions on this matter, please write to me at the letterhead address or call Willard Hanks (engineering) or Cleve Holladay (modeling) at 904-488-1344.

Sincerely,

C. H. Fancy, P.E.
Chief
Bureau of Air Regulation

CHF/WH/plm

c: Bill Thomas, SWD
John Koogler, P.E.

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P 832 538 663

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Street & No.: P. O. Box 1110	
P.O., State & ZIP Code: Mulberry, FL 33860	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Address of Delivery	
TOTAL Postage & Fees	$
Postmark or Date: Mailed: 7-26-91 Permit: AC 53-199112 PSD-FL-179	

PS Form 3800, June 1990

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece next to the article number.

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Mr. Selwyn Presnell
Environmental Manager
Agrico Chemical Company
P. O. Box 1110
Mulberry, FL 33860

4a. Article Number
P 832 538 663

4b. Service Type
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

5. Signature (Addressee)

6. Signature (Agent)

7. Date of Delivery
7-30

8. Addressee's Address (Only if requested and fee is paid)

PS Form 3811, October 1990 ★U.S. GPO: 1990—273-861 **DOMESTIC RETURN RECEIPT**

Willard's

Florida Department of Environmental Regulation

Twin Towers Office Bldg. ● 2600 Blair Stone Road ● Tallahassee, Florida 32399-2400

Lawton Chiles, Governor

Carol M. Browner, Secretary

August 26, 1991

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Selwyn Presnell, Environmental Manager
Agrico Chemical Company
Post Office Box 1110
Mulberry, Florida 33860

Dear Mr. Presnell:

PSD-FL-179

Re: AC 53-201152, Molten Sulfur Storage and Handling System

The Department has made a preliminary review of your application for permit to modify the molten sulfur storage and handling system at Agrico Chemical Company's South Pierce plant. Before this application can be processed, the Department will need the following information:

1. Please clarify the process rate for this system. The 150,000 lbs/hr process rate for sulfur listed in Section III B. of the application is not equivalent to the maximum process rate of 2,050 TPD listed in Attachment II.

2. What is the basis of the pollutant concentrations listed in Attachment 1? What is the ventilation rate for the system?

3. Please provide a copy of the Koogler and Enviroplan data that the 0.2 grains/dscf sulfur particle concentration is based on.

4. What is the basis of the equilibrium concentrations for H_2S, SO_2, and VOC? What is the relationship between the equilibrium concentrations, concentrations in Attachment 1, and the emission estimates?

5. Please provide a copy of the 3 references for emission estimates prepared by Dr. John B. Koogler.

6. What is the basis for the wind induced ventilation for the 5 vents on the storage tanks (Attach. 3c, 4.c.)?

Recycled Paper

We will resume processing the application after the requested information is received. If you have any questions on this matter, please write to me or call Willard Hanks at 904-488-1344.

Sincerely,

C. H. Fancy, P.E.
Chief
Bureau of Air Regulation

CHF/WH/plm

c: Bill Thomas, SW Dist.
Pradeep Raval, P.E.

MEMORANDUM

To: J. Harry Kerns, P.E.

From: Gary A. Maier Gary A. Maier

Date: October 1, 1991

Subject: IMC's Installation of the Monsanto Monarch Process

Issue

Whether to treat IMC's installation of the Monsanto Monarch sulfuric acid process as a "Modification".

Rule

A "Modification" occurs if (a) any physical change results in (b) an increase in the actual emissions of any regulated air pollutant. Both triggers, (a) and (b), must be pulled.

Analysis

(1) Courts considering the "modification" question have assumed that "any physical change" means precisely that. The term "modification" is nowhere limited to physical changes exceeding a certain magnitude. Based on the attached information, it is clear that IMC's installation of the Monsanto Monarch sulfuric acid process constitutes a physical change. The first trigger is pulled.

(2) The Department does not have sufficient information to determine whether the physical change from the old process to the Monsanto Monarch process, coupled with the concurrent increase in process rate, will result in an increase in the actual emissions of any regulated air pollutant. It is not known whether the second trigger is pulled.

Conclusion and Recommendation

The Department has no evidence to support a conclusion that the actual emissions of any regulated air pollutant will not increase. Therefore, I recommend that the Department presume that there will be an increase in the actual emission rate of a regulated air pollutant, and consequently presume that IMC's installation of the Monsanto Monarch process is a "Modification". The presumptions can be rebuttable. The burden to rebut the presumptions should be placed upon IMC.

BEST AVAILABLE COPY

THE MONARCH PROCESS

A Sulfuric Acid Plant for the 90's

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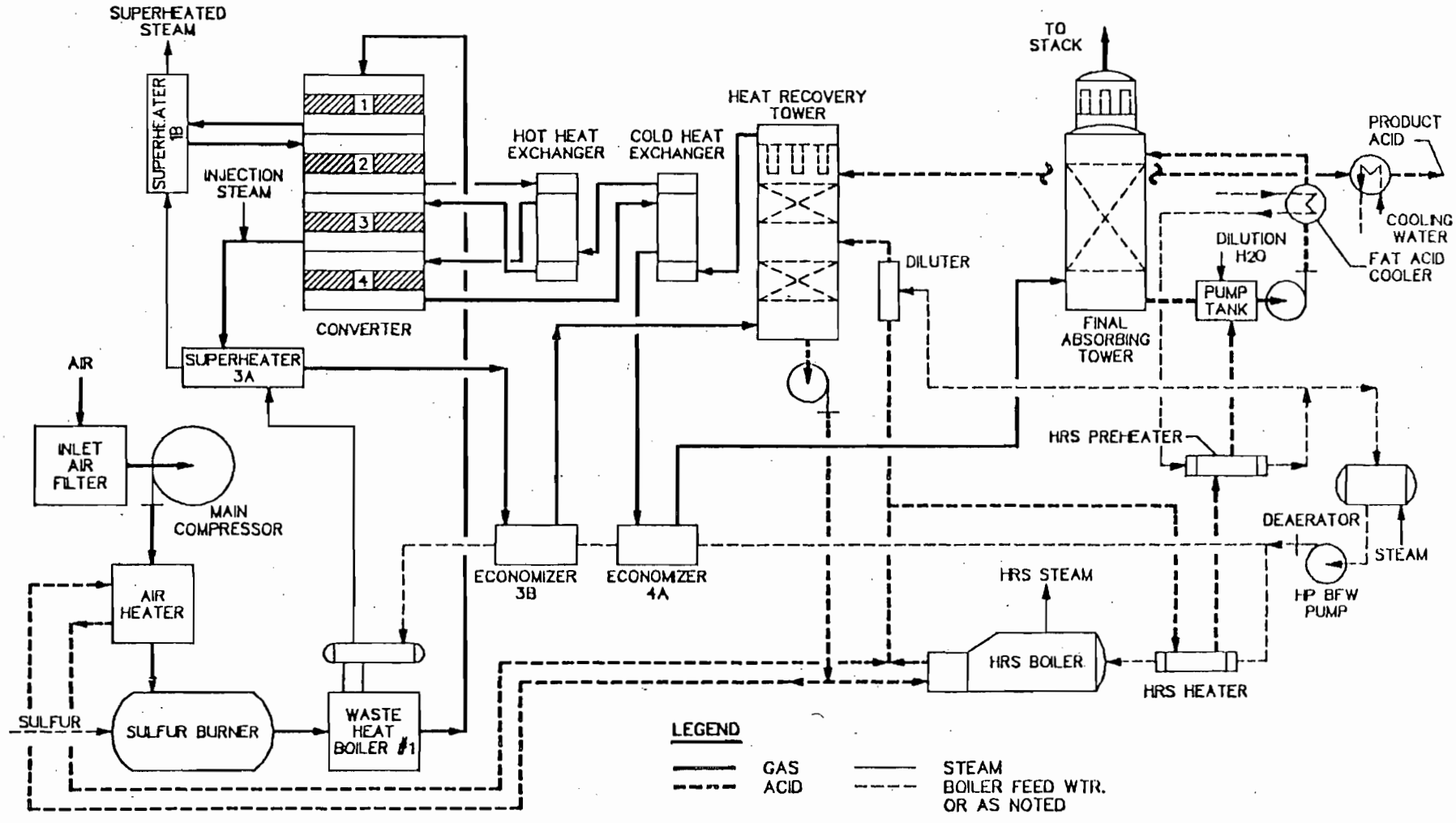


FIG.1 : PROCESS FLOW DIAGRAM

BEST AVAILABLE COPY

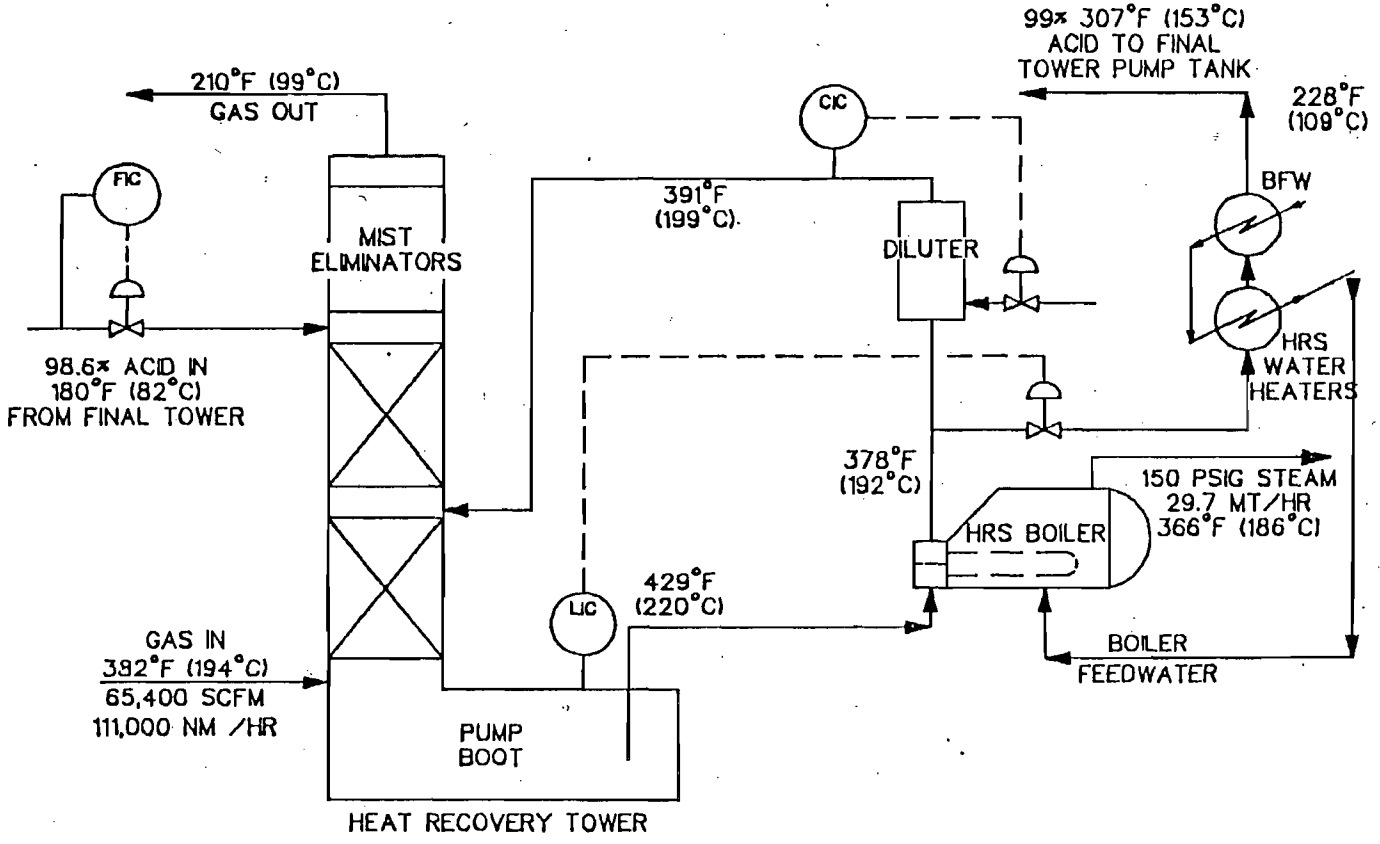


FIGURE 4 – HEAT RECOVERY SYSTEM

BEST AVAILABLE COPY

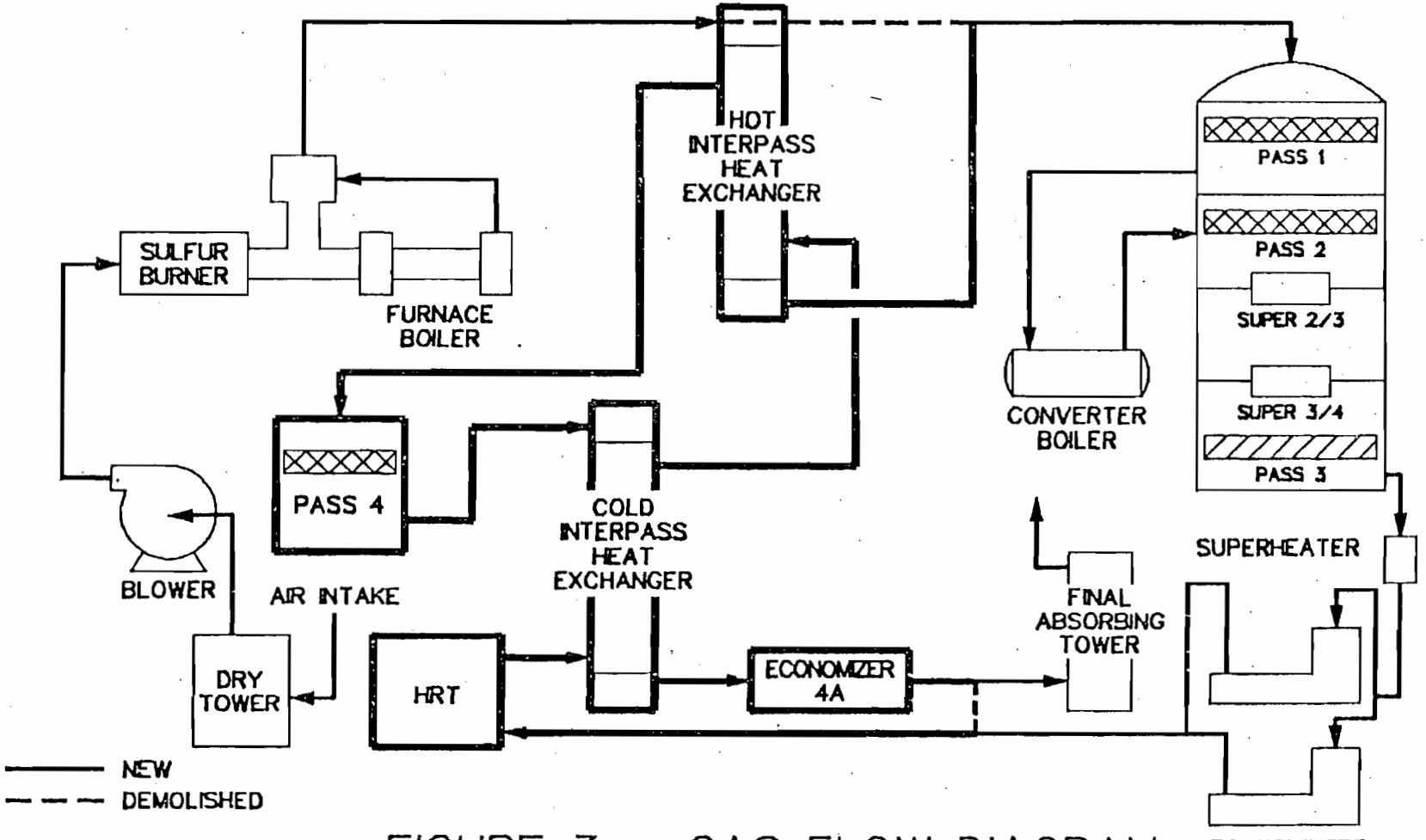


FIGURE 3 – GAS FLOW DIAGRAM

BEST AVAILABLE COPY

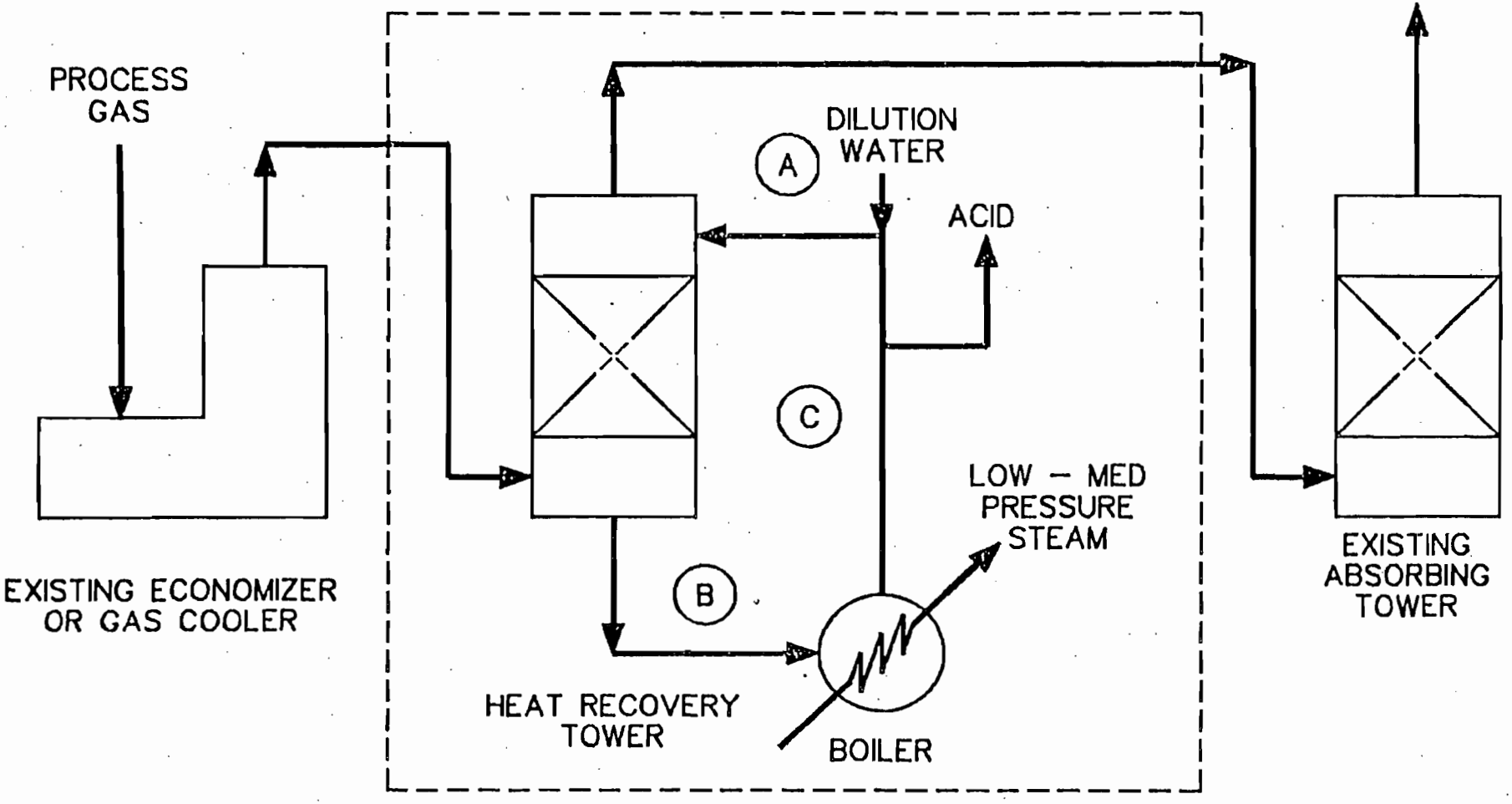


FIGURE 1 – HEAT RECOVERY SYSTEM

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
904/377-5822 ▪ FAX 377-7158

KA 261-91-01

October 1, 1991

RECEIVED
OCT 2 1991
Division of Air
Resources Management

Mr. Clair H. Fancy
Florida Department of
Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Subject: Air Construction Permit Application Review
Sulfuric Acid Plants No. 10 and 11 and
Molten Sulfur System
Agrico Chemical Company
Polk County, Florida
Permit File Nos. AC53-199112 and AC53-201152

PSD-FL-179

Dear Mr. Fancy:

This is in response to you letters, dated July 26 and August 26, 1991, requesting additional information on the above projects.

We are presently compiling the information requested by you and will submit it as soon as it is completed. Certain air modeling issues do need to be resolved with Mr. Cleve Holladay of your staff before an appropriate response to those issues can be finalized.

If you have any questions, please do not hesitate to give me a call.

Very truly yours,

KOOGLER & ASSOCIATES

Pradeep A. Raval

PAR:wa

c: Mr. Phillip Steadham, Agrico
M. Harris
C. Holladay
BA/PL

Florida Department of Environmental Regulation

Twin Towers Office Bldg. ● 2600 Blair Stone Road ● Tallahassee, Florida 32399-2400

Lawton Chiles, Governor

Carol M. Browner, Secretary

October 15, 1991

Mrs. Christine Shaver, Chief
Permit Review and Technical Support Branch
National Park Service-Air Quality Division
P. O. Box 25287
Denver, Colorado 80225

Dear Ms. Shaver:

RE: Agrico Chemical Company
Polk County
PSD-FL-179

As requested by your office, enclosed for your review and comment is the above referenced PSD permit application. If you have any questions or comments, please contact Willard Hanks or Cleve Holladay at (904) 488-1344.

Sincerely,

Patricia G. Adams

Patricia G. Adams
Planner
Bureau of Air Regulation

/pa

Enclosure

Recycled Paper

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
904/377-5822 ▪ FAX 377-7158

KA 261-91-01

October 22, 1991

RECEIVED
OCT 23 1991
Bureau of
Air Regulation

Mr. Clair Fancy
Florida Department of
Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Subject: Sulfuric Acid Plants 10 and 11 and
Molten Sulfur System
Agrico Chemical Company (SPCW)
Polk County, Florida
Permit File Nos. AC53-199112 and AC53-201152

Dear Mr. Fancy:

This is in response to two letters dated July 26 and August 26, 1991, requesting additional information on the above projects. Since FDER will review both applications as one overall project, the responses to the two letters are submitted together.

Sulfuric Acid Plants, Permit File No. AC 53-199112

1. What facilities will use the additional sulfuric acid produced by the modified plants? Where are these facilities located?

The additional sulfuric acid produced will be sold to the Sulfuric Acid Trading Company (SATCO) in Tampa.

2. What is the maximum rating of the turbogenerator? How many MW will be generated when the acid production is 2700 TPD?

The total power generation capacity of the existing No. 1 turbine generator and the new No. 2 turbine generator is about 47.8 MW.

3. In order to determine whether a proposed modification will result in significant net emissions increases of regulated pollutants, the increase or decrease is quantified by using the proposed "new allowable" emissions minus the "old actual" emissions. The old actual emissions must be based on the previous two years of operating data unless some other period is deemed to be more representative of normal operating conditions. Please recalculate the changes in all regulated pollutant emissions using this criteria. It appears the project may also be subject to PSD for nitrogen oxides based on this criteria. Please provide copies of the annual operating reports for the sulfuric acid plants during the 2 years selected to support your actual emission calculations. Please redo the appropriate modeling analyses using the corrected input values. The Department's files also indicate that the two sulfuric acid plants were permitted at only 1800 tons per day during the PSD SO_2 baseline year. This would impact PSD increment consumption. In addition, the existing molten sulfur system (current permit number A053-187290) which was permitted after-the-fact in 1990 has never been included in any modeling analysis. Emissions due to this source should be included in the appropriate modeling analyses.

Emission Calculations

The emission calculations have been revised as suggested by FDER using actual production factors in estimating actual annual emissions. The production data from the 1989 and 1990 annual operating reports which were relied on for the emission estimates are presented in Attachment 1 along with the revised calculations. It should be noted that although the

revised emission calculations reflect higher net emission increases as a result of the proposed project, the rule applicability remains the same for sulfur dioxide, sulfuric acid mist, and nitrogen oxides.

Modeling

The ambient air quality analysis submitted to FDER previously needs to be updated to incorporate two changes. The first issue addresses the inclusion of the SO_2 emissions from the molten sulfur system, totaling about 2.8 lbs/hr, into the ambient air quality analysis. The second issue concerns the baseline SO_2 emissions of sulfuric acid plant Nos. 10 and 11 which should have reflected an originally permitted production capacity of 1800 tons per day instead of 2000 tons per day for each plant. Accordingly, the PSD baseline SO_2 emissions for each of the acid plants should be represented as 300 lbs/hr (37.83 g/s) and not 333.3 lbs/hr (42.04 g/s) in the SO_2 Class II PSD increment consumption analysis.

To address the above changes in the ambient air quality impact analyses presented previously to FDER, two options were considered. The first option was to evaluate the incremental impact due to just the change in the emission rates previously modeled. The second option was to update the emission inventory and perform the entire modeling again. In discussing these options with both Mr. Tom Rogers and Mr. Cleve Holladay

of the FDER staff, it was agreed that the first option would be acceptable to FDER.

Molten Sulfur System Modeling

In accordance with the modeling protocol agreed to with FDER, the SO_2 emissions from the molten sulfur system were modeled using the ISC-ST model, Version 90346, with the entire system's SO_2 emissions modeled as being emitted from a single stack. The theoretical stack chosen is centrally located within the system and has the same vent characteristics as a molten sulfur storage tank vent. Since the sulfur system is surrounded by tall structures in all directions, building downwash was included in the modeling. The model input parameters are presented below:

Source No.	SO_2 Emissions (g/s)	X (m)	Y (m)	Height (m)	Temp. (°K)	Velocity (m/s)	Diameter (m)
1	0.35	0	0	7.3	366	1	0.3

Building Dimensions: Height = 18.3 meters, L/W = 100 meters

The receptor locations chosen for this modeling are the same as the receptor locations used in the previously submitted modeling.

It was conservatively assumed that the maximum impacts of the molten sulfur system, added to the previously predicted maximum impacts, would

result in the maximum combined predicted impact. An overly conservative maximum predicted impact would occur using this approach because the individual maximums could occur on different days and at different locations, as evident from the modeling.

The results of the molten sulfur system modeling are summarized in Table 1. The results are also compared with the previous PSD Increments Analysis in Table 3 and the Ambient Air Quality Standards Analysis in Table 4. Based on the modeling results it can be concluded that the sulfur dioxide emissions from the molten sulfur system will not cause or contribute to any violations of the ambient air quality standards.

PSD Increment Analysis

The appropriate PSD baseline SO_2 emissions for Agrico's sulfuric acid plant Nos. 10 and 11, based on a permitted sulfuric acid production of 1800 tons per day, would be 300 pounds per hour for each plant. Since the emission rate used in the previous analysis was 333.3 pounds per hour for each plant, the incremental impact analysis modeled simply the difference between the two numbers.

An emission rate of 33.3 lbs/hr (4.2 g/s) was modeled using the ISC-ST model, Version 90346, with the same stack characteristics and receptor locations as the previously used in the PSD increment analysis.

TABLE 1

SUMMARY OF SULFUR DIOXIDE AMBIENT AIR IMPACT ANALYSIS
MOLTEN SULFUR SYSTEM

AGRICO CHEMICAL COMPANY
POLK COUNTY, FLORIDA

Meteorological Data	Sulfur Dioxide Impacts ($\mu g/m^3$)[1]		
	Annual	3-hour	24-hour
1982	2.3 (500m, 240°)	79.7 (500m, 230°)	16.6 (500m, 280°)
1983	2.1 (500m, 240°)	76.3 (500m, 240°)	21.0 (500m, 270°)
1984	2.6 (500m, 250°)	83.9 (500m, 240°)	26.5 (500m, 250°)
1985	2.5 (500m, 240°)	70.6 (500m, 270°)	16.9 (500m, 240°)
1986	2.3 (500m, 240°)	93.0 (500m, 220°)	26.7 (500m, 250°)
Significant Impact (17-2.100(171)(a),FAC)	1.0	25.0	5.0

[1] The SO_2 ambient air impacts reflect the maximum predicted impacts and their location.

TABLE 2

SUMMARY OF INCREMENTAL SULFUR DIOXIDE IMPACT ANALYSIS
SULFURIC ACID PLANTS NOS. 10 AND 11

AGRICO CHEMICAL COMPANY
POLK COUNTY, FLORIDA

Meteorological Data	Sulfur Dioxide Incremental ($\mu g/m^3$)[1]		
	Annual	3-hour	24-hour
1982	-[2]	28.5 (750m, 250°)	9.2 (1000m, 360°)
1983	-	29.5 (750m, 40°)	8.8 (1000m, 250°)
1984	-	31.1 (500m, 270°)	7.9 (750m, 250°)
1985	-	31.3 (750m, 80°)	8.1 (2000m, 120°)
1986	1.0 (750m, 90°)	31.2 (500m, 90°)	8.6 (750m, 90°)

[1] The SO_2 ambient air impacts reflect the maximum predicted impacts and their location.

[2] See previous modeling results.

TABLE 3

SUMMARY OF SULFUR DIOXIDE PSD INCREMENT ANALYSIS

AGRICO CHEMICAL COMPANY
POLK COUNTY, FLORIDA

Ambient Air Impact	Sulfur Dioxide Impact ($\mu g/m^3$)		
	Annual	3-hour	24-hour
Revised Incremental Impacts	1.0	31.3	9.2
Molten Sulfur System Impacts	2.6	93.0	26.7
Previously Modeled Impacts	3.2	142.3	44.3
Total Predicted Impacts	6.8	266.6	80.2
Allowable Class II PSD Increment	20	512	91

TABLE 4

SUMMARY OF AMBIENT AIR QUALITY STANDARDS
ANALYSIS FOR SULFUR DIOXIDE

AGRICO CHEMICAL COMPANY
POLK COUNTY, FLORIDA

Ambient Air Impact	Sulfur Dioxide Impact ($\mu g/m^3$)		
	Annual	3-hour	24-hour
Molten Sulfur System Impacts	2.6	93.0	26.7
Previously Modeled Impacts	36.3	451.1	229.1
Total Predicted Impacts	38.9	544.1	255.8
Ambient Air Quality Standard	60	1300	260

As with the molten sulfur system modeling, it was conservatively assumed that the maximum impacts of the emission rate modeled, added to the previously predicted maximum impacts, would result in the maximum combined predicted impact.

The results of the incremental SO_2 emissions analysis are presented in Table 2 and compared with the previous PSD Increments Analysis in Table 3. Based on the results, it can be concluded that the revised PSD SO_2 baseline emissions for the two sulfuric acid plants at Agrico's facility will not cause or contribute to any violations of the allowable SO_2 Class II PSD Increments.

The modeling output is presented as a separate appendix and also on diskette.

4. The application does not contain process flow diagrams for the proposed modified facility. Although Figures 3-1A and 3-1B purport to be process flow diagrams, they are, in actuality, plant equipment layout diagrams. Please submit process flow diagrams for the actual (not typical) proposed modified facility.

A process flow diagram for Agrico's modified sulfuric acid manufacturing process is presented in Attachment 2.

5. **The plant equipment layout diagrams (Figures 3-1A and 3-1B) seem to indicate that drying towers will be utilized. Please confirm that the drying towers will be utilized in the proposed modified facility. Utilization of the drying towers should be reflected in the process flow diagrams requested above.**

The drying towers will continue to be used in the proposed modified facility as indicated on the attached process flow diagram.

6. **Please provide the Department with reasonable assurance that the efficiency of the converters will not be degraded while operating at the proposed new process conditions and higher process rates. The answer to this question must:**

   a. **completely describe the process streams that each converter was originally designed to handle,**

   b. **completely describe the process streams that each converter will handle in the proposed modified facility, and**

   c. **explain why the differences between (a) and (b) will not degrade converter efficiency.**

7. **Please provide the Department with reasonable assurance that the efficiency of the absorbers will not be degraded while operating at the proposed new process conditions and higher process rates. The answer to this question must:**

   a. **completely describe the process streams that each absorber was originally designed to handle,**

   b. **completely describe the process streams that each absorber will handle in the proposed modified facility, and**

   c. **explain why the differences between (a) and (b) will not degrade absorber efficiency.**

8. Please provide the Department with reasonable assurance that the efficiency of the mist eliminators will not be degraded while operating at the proposed new process conditions and higher process rates. The answer to this question must:

a. completely describe the process streams that each mist eliminator was originally designed to handle,

b. completely describe the process streams that each mist eliminator will handle in the proposed modified facility, and

c. explain why the differences between (a) and (b) will not degrade mist eliminator efficiency.

The efficiency of the final tower/mist eliminators should remain the same because the gas volume through the final tower/mist eliminator will be approximately the same as the current operation with approximately the same acid flow over the tower.

The gas strength to the converter will be increased to 11.8% equivalent SO_2. Additional catalyst will be added to each of the converter beds to maintain 99.7% overall conversion of SO_2 to SO_3. See Attachment 3 for details on process flows.

As additional assurance that Agrico's modified sulfuric acid plants will meet the applicable regulatory requirements, test data from a similarly modified plant at IMC is presented in Attachment 4. The IMC sulfuric acid plant utilizes the same Heat Recovery System (HRS) technology that is proposed for the sulfuric acid plants at Agrico. The IMC compliance test

data demonstrate that the acid plants modified for additional heat recovery using the HRS technology will be able to comply with the applicable sulfur dioxide and sulfuric acid mist emission standards.

9. Please submit emissions reports demonstrating compliance with FAC Rule 17-2.600(2)(b) and 40 CFR 60, Subpart H, from an operating sulfuric acid plant utilizing the same Monsanto process proposed for this modified facility.

As stated in response 8 above, the compliance test data from the IMC plant utilizing the HRS technology proposed for Agrico demonstrate the ability of such a plant to comply with the applicable air emission standards.

Molten Sulfur Storage System, Permit File No. AC 53-201152

1. Please clarify the process rate for this system. The 150,000 lbs/hr process rate for sulfur listed in Section IIIB. of the application is not equivalent to the maximum process rate of 2,050 TPD listed in Attachment II.

The 150,000 pounds per hour molten sulfur utilization rate listed in the permit application form corresponds to the molten sulfur requirement of the sulfuric acid plants. The 2050 tons per day molten sulfur process rate listed in Attachment II corresponds to the maximum sulfur receiving rate via railcars/tanker trucks.

2. What is the basis of the pollutant concentrations listed in Attachment 1? What is the ventilation rate for the system?

3. Please provide a copy of the Koogler & Enviroplan data that the 0.2 grains/dscf sulfur particle concentration is based on.

4. What is the basis of the equilibrium concentrations for H_2S, SO_2, and VOC? What is the relationship between the equilibrium concentrations, concentrations in Attachment 1, and the emission estimates?

5. Please provide a copy of the 3 references for emission estimates prepared by Dr. John B. Koogler.

6. What is the basis for the wind induced ventilation for the 5 vents on the storage tanks (Attach. 3c, 4,c.)?

The response to questions 2, 3, 4, 5, and 6, can be best addressed by a summary of how the emission factors for various pollutants and the ventilation rates for molten sulfur storage tanks were developed. This information is provided in Attachment 5. There are numerous references which form the basis of the emission calculation protocol used by all the molten sulfur handling facilities when air construction permit applications were submitted to FDER. Copies of the references noted in the summary document are not attached because they are quite voluminous and are already in the FDER files on the Sulfur Rulemaking and also in the initial group of molten sulfur facility air construction permit applications.

The emission calculations for the modification of the existing molten sulfur system follows the same format as the emission calculations initially submitted to, and accepted by, FDER. The only changes are the proposed molten sulfur handling rates which correspond to the requested increase in the permitted sulfuric acid production rates.

I would very much appreciate your prompt review of the information being submitted and will be glad to provide any other information you may require to expedite the permitting process.

If you have any questions, please do not hesitate to give me a call.

Very truly yours,

KOOGLER & ASSOCIATES

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

JBK:wa
Enc.

c: Mr. Phillip Steadham, Agrico
Mr. William Thomas, FDER SW District
A. Hanks
C. Holladay
J. Harper, EPA
C. Shaver, NPS

ATTACHMENT 1

REVISED EMISSION CALCULATIONS

CHANGES IN PRODUCTION AND EMISSION RATES

AGRICO CHEMICAL COMPANY
POLK COUNTY, FLORIDA

	Sulfuric Acid Plant 10	Sulfuric Acid Plant 11
Permit Allowable Conditions		
Rate (TPD)	2000	2000
SO2 (lb/ton)	4	4
(lb/hr)	333.3	333.3
(TPY)	1460	1460
Mist (lb/ton)	0.15	0.15
(lb/hr)	12.5	12.5
(TPY)	54.8	54.8
Operating Factor	1	1
Actual Conditions		
Rate (TPD)	2000	2000
SO2 (lb/ton)	3.21	3.5
(lb/hr)	306.8	297.7
(TPY)	1097.2	1205.1
Mist (lb/ton)	0.104	0.127
(lb/hr)	11.0	10.3
(TPY)	35.5	43.4
Operating Factor	0.937	0.935
Proposed Conditions		
Rate (TPD)	2700	2700
SO2 (lb/ton)	4	4
(lb/hr)	450.0	450.0
(TPY)	1971.0	1971.0
Mist (lb/ton)	0.15	0.15
Mist (lb/hr)	16.9	16.9
(TPY)	73.9	73.9
Operating Factor	1	1

NOTE:

1. See Appendix for calculations of emission rates.
2. Sulfuric acid plants No. 10 and 11 are permitted to operate 8760 hours per year.

NET EMISSION INCREASES(1)

AGRICO CHEMICAL COMPANY
POLK COUNTY, FLORIDA

Pollutant	Emissions (tons/yr) Sulfuric Acid Plant 10	11
SO2		
Present (actual)	1097.2	1205.1
Proposed	1971.0	1971.0
Change	873.8	765.9
Total Increase	1639.7	
Significant Increase (3)	40	
MIST		
Present (actual)	35.5	43.4
Proposed	73.9	73.9
Change	38.4	30.5
Total Increase	68.9	
Significant Increase (3)	7	
NOx		
Present (actual)(2)	41.0	41.0
Proposed(2)	59.1	59.1
Change	18.1	18.1
Total Increase	36.2	
Significant Increase (3)	40	

(1) See Appendix for emission calculations.
(2) NOx emissions based on Monsanto data.
(3) Presented in Table 500.2, Chapter 17-2, FAC.

EMISSION RATE CALCULATIONS

PERMITTED CONDITIONS: (Each Plant)

SULFURIC ACID PLANTS NO. 10 AND 11

2000 tons per day 100% acid (rated capacity)
SO2 - 4.0 lbs/ton
Mist - 0.15 lb/ton
Operating Factor - 1.0
(Based on Permits No. A053-176685 and A053-145510)

ACTUAL CONDITIONS:

(Emissions based on previous compliance test results)

See Table 2-1.

SULFURIC ACID PLANT NO. 10

2000 tons per day 100% acid
SO2 - 3.21 lbs/ton
Mist - 0.104 lb/ton
Operating Factor - 0.937 (Based on 89-90 production data)

SULFURIC ACID PLANT NO. 11

2000 tons per day 100% acid
SO2 - 3.53 lbs/ton
Mist - 0.127 lb/ton
Operating Factor - 0.935 (Based on 89-90 production data)

PROPOSED CONDITIONS: (Each Plant)

SULFURIC ACID PLANTS NO. 10 AND 11

2700 tons per day 100% acid
SO2 - 4.0 lbs/ton
Mist - 0.15 lb/ton
Operating Factor - 1.0

PERMITTED EMISSION RATE CALCULATIONS (Each Plant)

SULFURIC ACID PLANTS NO. 10 AND 11

SO2:	Hourly	=	4.0 lbs/ton x 2000/24 tons/hr
		=	333.3 lb/hr
	Annual	=	333.3 lbs/hr x 8760 hrs/yr x 1/2000 ton/lb
		=	1460.0 TPY
MIST:	Hourly	=	0.15 lb/ton x 2000/24 tons/hr
		=	12.5 lbs/hr
	Annual	=	12.5 lbs/hr x 8760 hrs/yr x 1/2000 ton/lb
		=	54.8 TPY

ACTUAL EMISSION RATE CALCULATIONS

(Emissions based on previous compliance test results)

SULFURIC ACID PLANT NO. 10

SO2:	Hourly	=	306.8 lbs/hr
	Annual	=	3.21 lbs/ton x (638,230 + 728,999)/2 tons/yr x 1/2000 ton/lb
		=	1097.2 TPY
MIST:	Hourly	=	11.0 lbs/hr
	Annual	=	0.104 lb/ton x (638,230 + 728,999)/2 tons/yr x 1/2000 ton/lb
		=	35.5 TPY
NOx	Hourly	=	2000 tons/day x 0.12 lb/ton x 1/24 day/hr
		=	10.0 lbs/hr (NOx emission factor based on Monsanto data attached)
	Annual	=	0.12 lb/ton x (638,230 + 728,999)/2 ton/yr x 1/2000 ton/lb
		=	41.0 TPY

SULFURIC ACID PLANT NO. 11

SO2:	Hourly	=	297.7 lbs/hr
	Annual	=	3.53 lbs/ton x (639,508 + 726,088)/2 tons/yr x 1/2000 ton/lb
		=	1205.1 TPY
MIST:	Hourly	=	10.3 lbs/hr
	Annual	=	0.127 lb/ton x (639,508 + 726,088)/2 tons/yr x 1/2000 ton/lb
		=	43.4 TPY
NOx	Hourly	=	2000 tons/day x 0.12 lb/ton x 1/24 day/hr
		=	10.0 lbs/hr
	Annual	=	0.12 lb/ton x (639,508 + 726,088)/2 ton/yr x 1/2000 ton/lb
		=	41.0 TPY

PROPOSED EMISSION RATE CALCULATIONS: (Each Plant)

SULFURIC ACID PLANTS NO. 10 AND 11

SO2:	Hourly	=	2700 tons/day x 4.0 lbs/ton x 1/24 day/hr
		=	450.0 lbs/hr
	Annual	=	450.0 lbs/hr x 8760 hr/yr x 1/2000 ton/lb
		=	1971.0 TPY
MIST:	Hourly	=	2700 tons/day x 0.15 lbs/ton x 1/24 day/hr
		=	16.9 lbs/hr
	Annual	=	16.9 lbs/hr x 8760 hrs/yr x 1/2000 ton/lb
		=	73.9 TPY
NOx	Hourly	=	2700 tons/day x 0.12 lb/ton x 1/24 day/hr
		=	13.5 lbs/hr
	Annual	=	13.5 lbs/hr x 8760 hrs/yr x 1/2000 ton/lb
		=	59.1 TPY

NET ANNUAL EMISSION CHANGES

Total Actual SO2	=	1097.2 + 1205.1 = 2302.3 TPY
Total Proposed SO2	=	2 x 1971 = 3942.0 TPY
Net Change SO2	=	3942 - 2302.3 = 1639.7 TPY
Total Actual Mist	=	35.5 + 43.4 = 78.9 TPY
Total Proposed Mist	=	2 x 73.9 = 147.8 TPY
Net Change Mist	=	147.8 - 78.9 = 68.9 TPY
Total Actual NOx	=	2 x 41.0 = 82.0 TPY
Total Proposed NOx	=	2 x 59.1 = 118.2 TPY
Net Change NOx	=	118.2 - 82.0 = 36.2 TPY

Best Available Copy

Florida Department of Environmental Regulation
Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

Form No. _____
Effective Date _____
DER Application No. _____
(Issued by the DER)

ANNUAL OPERATION REPORT FORM FOR AIR EMISSIONS SOURCES

For each permitted emission point, please submit a separate report for calendar year 19 90 prior to March 1st of the following year.

I GENERAL INFORMATION

1. Source Name: Agrico Chemical Company
2. Permit Number: A053-176685
3. Source Address: South Pierce Chemical Works, P.O. Box 1110
   Mulberry, Florida 33860
4. Description of Source: Sulfuric Acid Plant #10 - Double Absorption Contact Process with High Efficiency Demisters.

II ACTUAL OPERATING HOURS: 24 hrs/day 7 days/wk 52 wks/yr
Actual: 8623 hours

III RAW MATERIAL INPUT PROCESS WEIGHT: (List separately all materials put into process and specify applicable units if other than tons/yr)

Raw Material	Input Process Weight	
Sulfur	237,975	tons/y
		tons/y
		tons/y
		tons/y
		tons/y

IV PRODUCT OUTPUT (Specify applicable units)

Sulfuric Acid (100%)	728,999 Tons/year

DER Form 17-1.202(6)
Effective November 30, 1982

Northwest District: 160 Governmental Center, Pensacola, Florida 32501-5794, 904-436-8300
Northeast District: 3426 Bills Rd, Jacksonville, Florida 32207, 904-798-4200
Central District: 3319 Maguire Blvd, Suite 232, Orlando, Florida 32803-3767, 305-894-7555
Southwest District: 4520 Oak Fair Blvd, Tampa, Florida 33610-7347, 813-623-5561
South District: 2269 Bay St., Fort Myers, Florida 33901-2896, 813-332-2667
Southeast District: 1900 S. Congress Ave., Suite, West Palm Beach, Florida, 305-964-6668

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

SOUTHWEST DISTRICT
4520 OAK FAIR BLVD.
TAMPA, FLORIDA 33610-7347
813-623-5561
Suncom—552-7612

BOB MARTINEZ
GOVERNOR
DALE TWACHTMANN
SECRETARY
DR. RICHARD D. GARRITY
DISTRICT MANAGER

ANNUAL OPERATION REPORT FORM FOR AIR EMISSIONS SOURCES

For each permitted emission point, please submit a separate report for calendar year 19 89 prior to March 1st of the following year.

I GENERAL INFORMATION

1. **Source Name:** Agrico Chemical Company
2. **Permit Number:** A053-101764
3. **Source Address:** South Pierce Chemical Works, P.O. Box 1110
   Mulberry, Florida 33860
4. **Description of Source:** Sulfuric Acid Plant #10 - Double Absorption
   Contact Process with High Efficiency Demisters.

II ACTUAL OPERATING HOURS: 24 hrs/day 7 days/wk 52 wks/yr
Actual: 8194.8 hours

III RAW MATERIAL INPUT PROCESS WEIGHT: (List separately all materials put into process and specify applicable units if other than tons/yr)

Raw Material	Input Process Weight	
Sulfur	210,615.9	tons/yr
		tons/yr
		tons/yr
		tons/yr
		tons/yr

IV PRODUCT OUTPUT (Specify applicable units)

Sulfuric Acid (100%)	638,230.1 Tons/year

ATTACHMENT 2

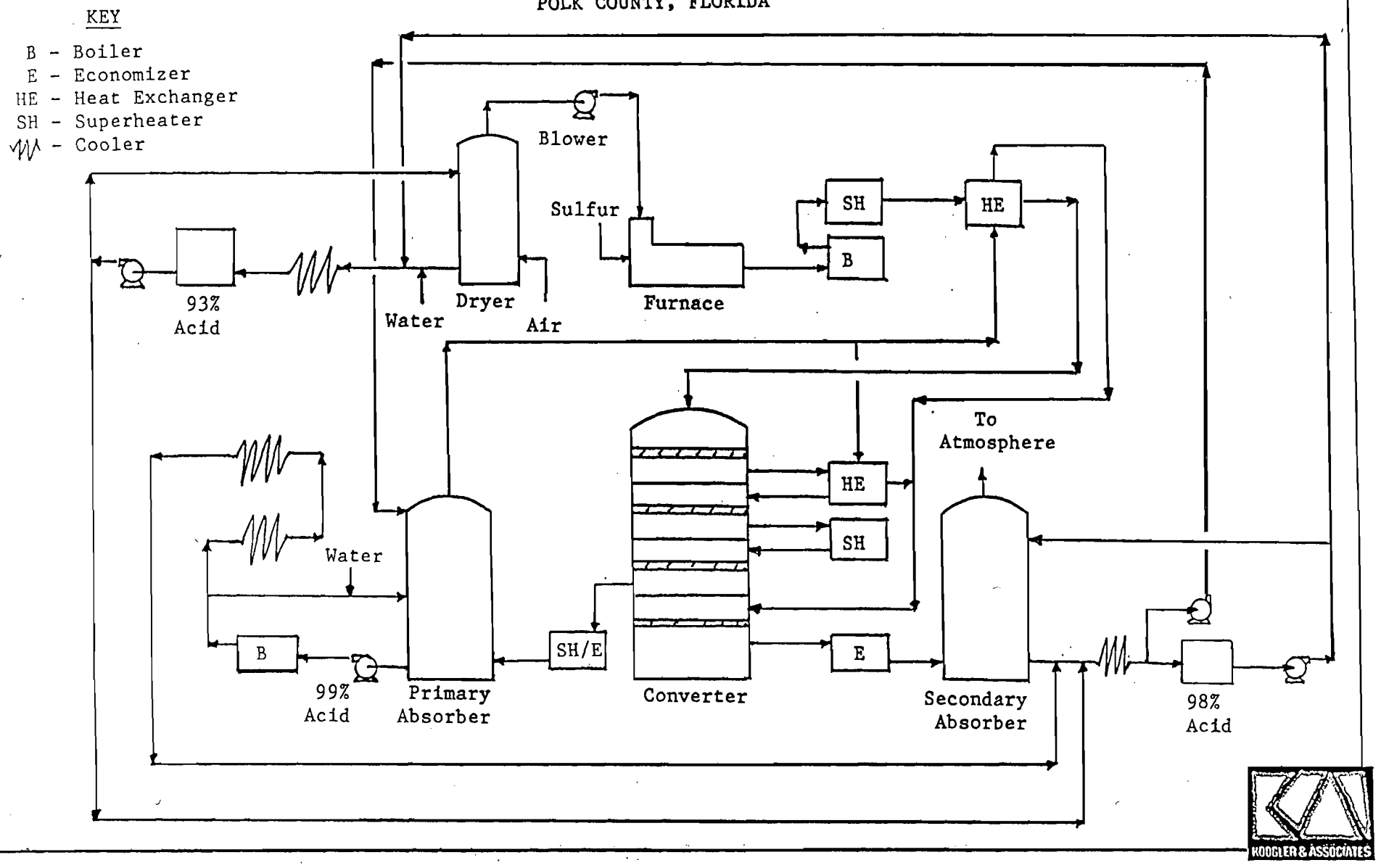
PROCESS FLOW DIAGRAM

KOOGLER & ASSOCIATES

DUAL ABSORPTION SULFURIC ACID PLANT

PROCESS FLOW DIAGRAM

AGRICO CHEMICAL COMPANY
POLK COUNTY, FLORIDA

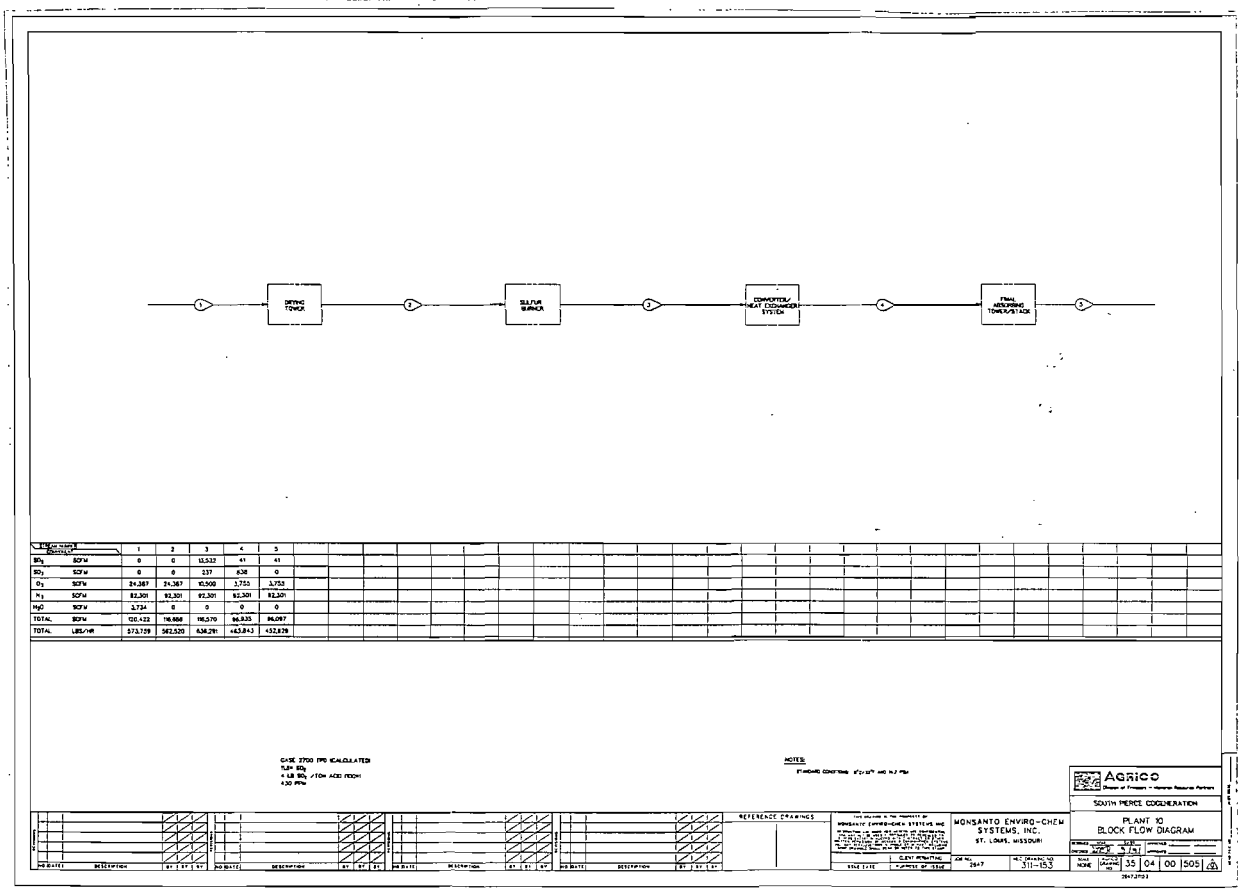


ATTACHMENT 3

PROCESS FLOW DETAILS

KOOGLER & ASSOCIATES

Best Available Copy



STREAM NUMBER / CONSTITUENT		1	2	3	4	5
SO_3	SCFM	0	0	13,532	41	41
SO_2	SCFM	0	0	237	638	0
O_2	SCFM	24,387	24,387	17,508	3,755	3,753
N_2	SCFM	82,301	82,301	92,301	82,301	82,301
H_2O	SCFM	3,734	0	0	0	0
TOTAL	SCFM	110,422	116,868	115,370	86,835	86,097
TOTAL	LBS/HR	573,739	562,520	636,291	463,843	452,828

CASE 3700 TPD SCALCULATED
FLEX SO_2
4.58 SO_2 /TON ACID MADE
430 PPM

NOTES:
STANDARD CONDITIONS 0°C (32°F) AND 14.7 PSIA

NO	DATE	DESCRIPTION	BY	BY	BY

REFERENCE DRAWINGS

THIS DRAWING IS THE PROPERTY OF MONSANTO ENVIRO-CHEM SYSTEMS, INC. IT IS LOANED IN CONFIDENCE AND IS NOT TO BE REPRODUCED OR COPIED IN WHOLE OR IN PART, OR USED IN ANY MANNER DETRIMENTAL TO THE INTEREST OF MONSANTO ENVIRO-CHEM SYSTEMS, INC. IT IS TO BE RETURNED UPON REQUEST.

CLIENT APPROVAL
SCALE: 1/16

MONSANTO ENVIRO-CHEM SYSTEMS, INC.
ST. LOUIS, MISSOURI

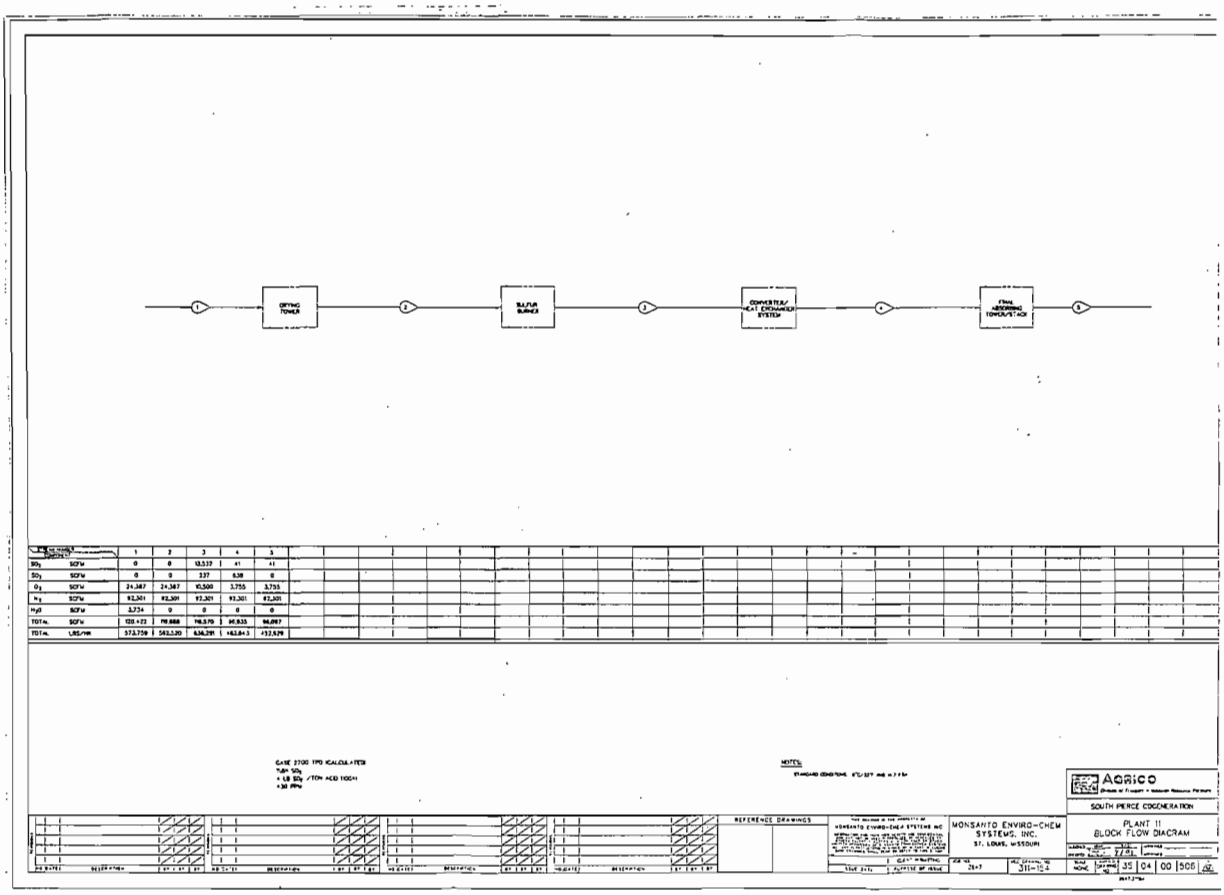
JOB NO. 2647
DWG NO. 311-153

Agrico
SOUTH PIERCE COGENERATION

PLANT 10
BLOCK FLOW DIAGRAM

SCALE: NONE
DRAWING NO. 35 04 00 505

Best Available Copy



		1	2	3	4	5
SO_3	SCFM	0	0	13,537	41	41
SO_2	SCFM	0	0	237	638	0
O_2	SCFM	24,387	24,387	10,500	3,755	3,755
N_2	SCFM	92,301	92,301	92,301	92,301	92,301
H_2O	SCFM	3,774	0	0	0	0
TOTAL	SCFM	120,462	116,688	116,575	96,835	96,097
TOTAL	LBS/HR	372,759	583,220	636,291	463,843	437,679

BASE 2700 TPD H2SO4 AS FEED
%SH SO_3
+ LB SO_3 /TON ACID FEED
+ 30 PPM

NOTES:
STANDARD CONDITIONS 60°F/32°F AND 14.7 PSIA

REFERENCE DRAWINGS

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MONSANTO ENVIRO-CHEM SYSTEMS, INC.
ST. LOUIS, MISSOURI

JOB NO. 2647
MEC DRAWING NO. 311-152

Agrico
SOUTH PIERCE COGENERATION

PLANT II
BLOCK FLOW DIAGRAM

SCALE NONE
DRAWING NO. 35 04 00 506 02

ATTACHMENT 4

IMC TEST DATA

KOOGLER & ASSOCIATES

Best Available Copy

Monsanto Enviro-Chem

RECEIVED
OCT 18 1991
Division of Air
Resources Management

Monsanto Enviro-Chem Systems, Inc.
Corporate Pointe
P.O. Box 14547
St. Louis, Missouri 63178-4547
Phone: (314) 275-5700

October 11, 1991

Mr. Clair H. Fancy
Florida Dept. of Environmental Regulations
Twin Towers Office Building
Tallahassee, Florida 32399-2400

Dear Mr. Fancy:

I understand per Mr. Kenneth Watkins of Agrico Chemical Co. that as a result of Agrico's DER permits application for a sulfuric acid project you have requested compliance data from a sulfuric acid plant which has been modified to incorporate Monsanto Enviro-Chem's Heat Recovery System. To satisfy that request please find enclosed the results of the compliance test taken 9/26/91 on IMC's plant 03.

The Heat Recovery System installed on IMC's plant is essentially the same process and equipment that will be installed on Agrico's plant. Much of the Heat Recovery System major equipment such as the tower, boiler and dilutor will be nearly identical.

I am also sending the enclosed compliance data to Mr. Pradeep Raval of Koogler & Associates a consultant working for Agrico who I understand is addressing this issue along with some other issues relative to Agrico's permit application. I expect the enclosed information will satisfy you needs if not please let me know.

Yours Truly,

Larry J. Ewing

Larry J. Ewing
Sr. Project Manager

cc: Paradeep Raval
Kenneth Watkins
David Randolph
Bob Smith

SUMMATION OF SULFURIC PLANT RATES AND COMPLIANCE RESULTS

EMISSION RATE CALCULATIONS FROM 40 CFR 60.84 & 60.85

E SO2/MIST = C SO2/MIST X S/0.265 - (0.0126 X O2)

E SO2/MIST = SO2/MIST EMISSION RATE, LB/TON ACID
C SO2/MIST = SO2/MIST CONCENTRATION, LB/DSCF OF SAMPLE
S = 11800 DSCF/TON ACID
O2 = OXYGEN CONCENTRATION OF STACK GAS

PLANT 03 DATE 9/26/91

RUN #	DSCF	MG. SO2	MG. MIST	% OXYGEN
1	42.59	1121.00	8.34	5.13
2	42.04	1107.00	8.36	5.13
3	42.03	969.00	8.90	5.28

		LBS/TON		LBS/TON
RUN 1	SO2	3.41	MIST	.03
RUN 2	SO2	3.41	MIST	.03
RUN 3	SO2	3.02	MIST	.03
AVG.		3.28		.03

BEGINNING FLOW METER READING	2973700	TIME/HRS	9 35
ENDING FLOW METER READING	3019200	TIME/HRS	12 52
MINUTES OF FLOW	197		
TOTAL FLOW/GAL	45500		
FLOW/GPM MAGMETER	231		

PRORATED PRODUCTION RATE FOR 24 HOURS 2442 TPD 100% ACID

DUPONT READING 320, EQUALS 3.15 LBS/TON

METHOD 7E NOX RESULTS

PPM*DSCFM*60*1/1E6*1/385*46 EQUALS LBS/HR NOX

NOX PPM	10.10	
DSCFM	110034	
LBS/HR NOX	7.97	(ALLOWABLE, 14.5 LBS/HR)
NOX LBS/TON OF H2SO4	.08	(ALLOWABLE, .12 LBS/TON)

9/26/91
SO2.CAL

Post-it™ brand fax transmittal memo 7671 | # of pages ▸

To DAVE RANDOLPH	From RCE & IMC
Co. MONSANTO	Co.
Dept.	Phone #
Fax # (314) 275 5701	Fax # 428-1563

Monsanto Enviro-Chem

MONSANTO ENVIRO-CHEM SYSTEMS INC.
Corporate Square Office Park
Box 14547
St. Louis, Missouri 63178

MR. CLAIR H. FANCY
FLORIDA DEPT. OF ENVIRONMENTAL REGULATIONS
TWIN TOWERS OFFICE BUILDING
TALLAHASSEE, FL 32399-2400

ATTACHMENT 5

MOLTEN SULFUR EMISSION FACTORS SUMMARY

EMISSION FACTORS FOR SULFUR PARTICLES, TRS, SO_2 AND VOC IN MOLTEN SULFUR STORAGE AND HANDLING SYSTEMS

Sulfur particle emissions have been measured by Koogler & Associates (November 1988) from molten sulfur storage tanks in the phosphate chemical fertilizer industry. The measured sulfur particle concentrations in the gases vented from the storage tanks have ranged from 0.3-0.5 grains/ft^3. The higher concentrations were measured when the tanks were being filled with molten sulfur, and the lower concentrations when the tanks were idle. The average natural ventilation rates on multi-vent tanks were measured at about 18 cfm/vent.

Measurements of sulfur particle emissions at the Pennzoil terminals in Tampa, Florida, in October 1986 by Enviroplan were measured at 0.46 grains/ft^3 (NOTE: Data was corrected by Koogler and comments were transmitted to FDER, December 30, 1986). However, later tests conducted by Enviroplan (1987) at Sulfur Storage Company, Inc. in Tampa, Florida, measured sulfur particle concentrations at 0.12 grain/ft^3. It is believed that the Pennzoil tests and the Koogler tests during tank filling could contain condensed organics. Enviroplan (1987) indicated the total particulate concentrations including condensible hydrocarbons could be 2.5 times the sulfur particulate concentration.

Therefore, a reasonable estimate of sulfur particle concentration under all conditions is:

$$(0.3 + 0.12)/2 = 0.2 \text{ grains/ft}^3$$

Air vented from molten sulfur storage tanks and pits is also expected to contain small quantities of total reduced sulfur compounds, including H_2S (TRS), sulfur dioxide and volatile organic compounds (VOCs). The volatile organic compounds result from small quantities of petroleum products contained in Frasch sulfur (approximately 0.25%) and the vaporization of these compounds at the storage temperature of molten sulfur. The reduced sulfur compounds result from the reduction of elemental sulfur in the presence of carbon supplied by the petroleum products and the SO_2 results from the oxidation of elemental sulfur.

A limited number of measurements have been made on molten sulfur storage tanks at Frasch sulfur terminals in the Tampa area to determine TRS, SO_2, and VOC concentrations in the headspace of the tanks over molten sulfur. These measurements have been made on molten sulfur storage tanks with capacities in the range of 10,000 tons which are air purged at rates between 10 and 63 cfm to prevent the accumulation of H_2S. Because of the size of the tanks, the fact that they are air purged and the fact that sulfur delivered to the Port of Tampa most probably has a higher fraction of VOCs (due to the fact that there has been less time for the volatile fraction of the petroleum products to vaporize), measurements made in Tampa will overestimate TRS, SO_2 and VOC emissions from phosphate chemical fertilizer facilities which later receive the sulfur. However, as no other

data is available, the Tampa data will be used to estimate TRS (including H_2S), SO_2 and VOC emissions factors for molten sulfur storage tanks and molten sulfur pits. It should be recognized that the application of these emission factors will overstate the actual emissions by some unknown amount.

Measurements of TRS made in November 1983 by TRC and reported in the FDER "Sulfur Report" (February 1984) show the following:

Tank Purge Rate (CFM)	TRS (as H2S) in Headspace Over Molten Sulfur (ppm, vol)
43	280
63	403

Measurements made by Enviroplan, Inc. in 1987 in the headspace over molten sulfur in a tank purged at the rate of 10 cfm showed an average TRS concentration of 638 ppm (vol).

A "typical" concentration of TRS (as H_2S) in the headspace over molten sulfur can be estimated from these data:

$$[280 + 403 + 2(638)]/4 = 490 \text{ ppm (vol)}$$

$$= 3.5 \times 10^{-5} \text{ lb/ft}^3 \text{ at } 200^{\circ}\text{F}$$

Measurements of SO_2 made by TRC (1983) in the tank headspace over molten sulfur at purge rates of 43 and 63 cfm averaged 553 ppm (vol). This converts to an SO_2 concentration of 7.3×10^{-5} lb/ft^3 at 200°F.

Measurements made by Enviroplan, Inc. (1987) in the tank headspace over molten sulfur at STI in Tampa showed VOC concentrations that averaged 5.2×10^{-5} lb/ft^3.

Table 1 summarizes the above emission factors for molten sulfur storage and handling systems.

TABLE 1
SUMMARY OF EMISSION FACTORS FOR
MOLTEN SULFUR STORAGE AND
HANDLING SYSTEMS

Air Pollutant	Emission Factor
Sulfur Particle	0.2 grains/ft^3
TRS (as H_2S)	3.5×10^{-5} lb/ft^3
SO_2	7.3×10^{-5} lb/ft^3
VOC	5.2×10^{-5} lb/ft^3

REFERENCES

1. "Preliminary Report on Emissions From Tank No. 4 at Sulfur Terminal Co.,Inc., Tampa, Florida." TRC Environmental Consultants, Inc., East Hartford, Connecticut, December 30, 1983.

2. "Sulfur Report." Bureau of Air Quality Management, Florida Department of Environmental Regulation, Tallahassee, Florida, February 1984.

3. "Sulfur Particulate Emission Measurement Project at the Pennzoil Terminals in Tampa, Florida." Enviroplan, Inc., West Orange, New Jersey, October 1986.

4. Comments in a letter dated December 30, 1986, by Dr. John Koogler, Koogler & Associates to Mr. Steve Smallwood, FDER, on Enviroplan's Pennzoil Sulfur Company emission measurement report.

5. "Technical Report Supporting Application to the Florida DER For An Alternate Sulfur Particulate Emissions Sampling Procedure." Enviroplan, Inc., West Orange, New Jersey, October 30, 1987.

6. "Particulate Matter Emission Measurements From Molten Sulfur Storage Tanks at Gardinier, Inc., Tampa, Florida." Koogler & Associates, Gainesville, Florida, November 7-8, 1988.

7. Discussions with Enviroplan, Inc. at a meeting in New Orleans, Louisiana, on July 6, 1989. Enviroplan supplied measurement data on TRS and VOC concentrations in the headspace over molten sulfur storage tanks at the Sulfur Terminals Company, Inc. in Tampa, Florida, for testing which was conducted during September 1987.

BEST AVAILABLE COPY

For Routing To Other Than The Addressee

To _____ Location _____

To _____ Location _____

To _____ Location _____

From _____ Date _____

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

Interoffice Memorandum

To: Willard M. Hanks, Air BAR, Tallahassee

Thru: J. Harry Kerns and W. C. Thomas

From: Gary A. Maier, Air Permitting, Tampa

Date: November 13, 1991

Subject: AC53-199112, Agrico Chemical Company, Sulfuric Acid Plants #10 and #11.

RECEIVED
NOV 18 1991
Division of Air Resources Management

Thank you for including questions from the Southwest District in your July 26, 1991 request for additional information to Agrico Chemical Company.

I reviewed the October 22, 1991 response from Koogler & Associates Environmental Services. The response, which includes a summary of a stack test at a similarly modified source, appears to satisfy the initial concerns raised by the Southwest District.

The Southwest District does not require any additional information regarding the above referenced permit application.

Florida Department of Environmental Regulation
Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400
Lawton Chiles, Governor
Carol M. Browner, Secretary

November 20, 1991

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Selwyn Presnell, Env. Mgr.
Agrico Chemical Company
Post Office Box 1110
Mulberry, Florida 33860

Dear Mr. Presnell:

Re: File Number AC 53-199112 Sulfuric Acid Plants Nos. 10 & 11
File Number AC 53-201152 Molten Sulfur Storage System

The Department has reviewed your response received on October 23, 1991 to its incompleteness letters of July 26, 1991 and August 26, 1991. In addition, the National Park Service has communicated its concerns to the Department about the impact this project may have on the Chassahowitzka Class I area located to the northwest of your facility. Before this application can be processed further, the Department will need the following information:

Please evaluate the impact of this project on the Class I Chassahowitzka National Wilderness Area. This evaluation should include a cumulative SO_2 PSD Class I increment analysis, a visibility analysis, and an air quality related values analysis (AQRV). The AQRV analysis includes impacts to soils, vegetation, and wildlife.

Please send the requested information to Cleve Holladay at the above address. The processing of your application will continue as soon as this information is received.

Sincerely,

Barry D. Andrews

for C. H. Fancy, P.E.
Chief
Bureau of Air Regulation

CHF/kt

cc: B. Thomas, SW District
J. Koogler, P.E.
J. Harper, EPA
C. Shaver, NPS

Recycled Paper

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece next to the article number.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Mr. Selwyn Pressnell, Env. Mgr
Agrico Chemical Co
P.O. Box 1110
Mulberry, Fl 33860

4a. Article Number
P 617 884 189

4b. Service Type
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery
11-25-91

5. Signature (Addressee)
6. Signature (Agent)

8. Addressee's Address (Only if requested and fee is paid)

PS Form **3811**, October 1990 ☆U.S. GPO: 1990—273-861 **DOMESTIC RETURN RECEIPT**

PS Form **3800**, June 1990

Certified Mail Receipt
No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

UNITED STATES POSTAL SERVICE

Sent to
Selwyn Pressnell
Street & No.
Agrico Chem. Co
P.O. State & ZIP Code
Mulberry, Fl

Postage	$
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Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Address of Delivery	
TOTAL Postage & Fees	$
Postmark or Date	AC 53-199112 201152 11-20-91

P 617 884 189

Best Available Copy

STATE OF FLORIDA
DEPARTMENT OF
ENVIRONMENTAL
REGULATION
NOTICE OF
INTENT TO
ISSUE PERMIT

The Department of Environmental Regulation gives notice of its intent to issue construction permits to Agrico Chemical Company, P. O. Box 1110, Mulberry, Florida 33860. The permits will allow the applicant to modify (increase production) the existing molten sulfur storage and handling facility (AC 53-201152) and the Nos. 10 and 11 sulfuric acid plants (AC 53-199112 and PSD-FL-179) at Agrico's South Pierce phosphate fertilizer manufacturing plant on State Road 630 near Fort Meade, Polk County, Florida 33841. The modification to the sulfuric acid plants require a Best Available Control Technology (BACT) determination for sulfur dioxide and acid mist. The ambient air impact of the emissions for sulfur dioxide from this facility are estimated to be 38.9 ug/m3 (annual), 255.8 ug/m3 (24 hr), and 544.1 ug/m3 (3 hr). The PSD increments for sulfur dioxide consumed by this facility in the Class II area are estimated to be 6.8 ug/m3 (annual) or 34% of the available increment, 80.2 ug/m3 (24 hr) or 88% of the available increment, and 266.6 ug/m3 (3 hr) or 52% of the available increment. The sulfur dioxide emissions from this modification will have no significant impact in the Class I Chassahowitzka National Wilderness Area. These emissions will not cause a violation of any ambient air quality standard or Prevention of Significant Deterioration (PSD) increment. The Department is issuing this Intent to Issue for the reasons stated in the Technical Evaluation and Preliminary Determination.

A person 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 contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, within (14) days of publication of this notice. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

The Petition shall contain the following information; (a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed; (b) A statement of how and when each petitioner received notice of the Department's action or proposed action; (c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action; (d) A statement of the material facts disputed by Petitioner, if any; (e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action; (f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and (g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

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 position taken by it in this Notice. Persons whose substantial interests will be affected by any decision of the Department with regard to the application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of publication of this notice in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

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: Department of Environmental Regulation, Bureau of Air Regulation, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400; Department of Environmental Regulation, Southwest District, 4520 Oak Fair Blvd., Tampa, Florida 33610-7347.

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

Further, a public hearing can be requested by any person. Such requests must be submitted within 30 days of this notice.

Mar: 12, 1992—0765

Attached is a checking copy of your public notice. Please notify us immediately of any changes or deletions which you may find necessary.

Thank you for your patronage.

The Polk County Democrat
P. O. Box 120, Bartow, Florida 33830
(813) 533-4183

RECEIVED
MAR 20 1992
Division of Air
Resources Management

Your Public Notice
was sent to
EPA - Atlanta, GA
in Error.

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
904/377-5822 ▪ FAX 377-7158

KA 261-91-01

February 27, 1992

Mr. C. H. Fancy
Florida Department of
Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Subject: Agrico Chemical Company
Polk County, Florida
Modification of No. 10 and No. 11
Sulfuric Acid Plants
FDER File No. AC53-199112 and PSD-FL-179

Dear Mr. Fancy:

Attached is the supplemental information on Agrico's impact on air quality related values for your review.

It is our understanding that all the information necessary to process the above permit has been submitted. We would appreciate your prompt review.

If you have any questions, please do not hesitate to contact me.

Very truly yours,

KOOGLER & ASSOCIATES

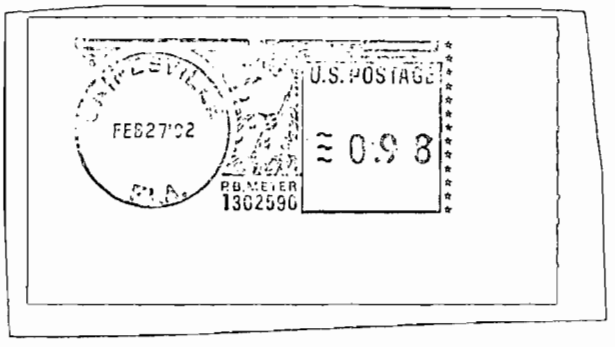
John B. Koogler

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

JBK:wa
Enc.

RECEIVED
MAR 0 2 1992
Division of Air
Resources Management

c: Mr. John Vimont, National Park Service
Mr. Tom Rogers, FDER
Mr. Cleve Holladay, FDER
Mr. Selwyn Presnell, Agrico
A. Hanks
B. Thomas, SW Dist
G. Napier, EPA



KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES

4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
904/377-5822 • FAX 377-7158

TO: Mr. C. H. Fancy
Florida Department of
Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

FIRST CLASS MAIL

Best Available Copy

AFFIDAVIT OF PUBLICATION

The Polk County Democrat

Published Semi-Weekly
Bartow, Polk County, Florida

Case No. _____

STATE OF FLORIDA
COUNTY OF POLK

Before the undersigned authority personally appeared _____
S. L. Frisbie, IV, who on oath says that (s)he is
Publisher of The Polk County Democrat, a newspaper published at Bartow, Polk County, Florida; that the attached copy of advertisement, being a Notice of Intent to Issue Permit in the matter of Agrico Chemical Company

in the _____ Court, was published in said newspaper in the issues of March 12, 1992.

Affiant further says that The Polk County Democrat is a newspaper published at Bartow, in said Polk County, Florida, and that said newspaper has heretofore been continuously published in said Polk County, Florida, each Monday and Thursday, and has been entered as second class matter at the post office in Bartow, in said Polk County, Florida, for a period of one year next preceeding 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 said newspaper.

Signed _____

The foregoing instrument was acknowledged before me this 16th day of March, 19 92, by S. L. Frisbie, IV,

who is personally known to me.

Teresa M Pacetti
(Signature of Notary Public)

Teresa M. Pacetti
(Printed or typed name of Notary Public)

Notary Public

My Commission Expires: NOTARY PUBLIC STATE OF FLORIDA

Notary Public, State of Florida
TERESA M. PACETTI
My Comm. Exp. Dec. 19, 1995
Comm. No. CC 169408

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION NOTICE OF INTENT TO ISSUE PERMIT

The Department of Environmental Regulation gives notice of its intent to issue construction permits to Agrico Chemical Company, P. O. Box 1110, Mulberry, Florida 33860. The permits will allow the applicant to modify (increase production) the existing molten sulfur storage and handling facility (AC 53-201152) and the Nos. 10 and 11 sulfuric acid plants (AC 53-199112 and PSD-FL-179) at Agrico's South Pierce phosphate fertilizer manufacturing plant on State Road 630 near Fort Meade, Polk County, Florida 33841. The modification to the sulfuric acid plants require a Best Available Control Technology (BACT) determination for sulfur dioxide and acid mist. The ambient air impact of the emissions for sulfur dioxide from this facility are estimated to be 38.9 ug/m3 (annual), 255.8 ug/m3 (24 hr), and 544.1 ug/m3 (3 hr). The PSD increments for sulfur dioxide consumed by this facility in the Class II area are estimated to be 6.8 ug/m3 (annual) or 34% of the available increment, 80.2 ug/m3 (24 hr) or 88% of the available increment, and 266.6 ug/m3 (3 hr) or 52% of the available increment. The sulfur dioxide emissions from this modification will have no significant impact in the Class I Chassahowitzka National Wilderness Area. These emissions will not cause a violation of any ambient air quality standard or Prevention of Significant Deterioration (PSD) increment. The Department is issuing this Intent to Issue for the reasons stated in the Technical Evaluation and Preliminary Determination.

A person 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 contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, within (14) days of publication of this notice. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

The Petition shall contain the following information; (a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed; (b) A statement of how and when each petitioner received notice of the Department's action or proposed action; (c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action; (d) A statement of the material facts disputed by Petitioner, if any; (e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action; (f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; g

Best Available Copy

(g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

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 position taken by it in this Notice. Persons whose substantial interests will be affected by any decision of the Department with regard to the application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of publication of this notice in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

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: Department of Environmental Regulation, Bureau of Air Regulation, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, Department of Environmental Regulation, Southwest District, 4520 Oak Fair Blvd., Tampa, Florida 33610-7347.

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

Further, a public hearing can be requested by any person. Such requests must be submitted within 30 days of this notice.

Mar. 12, 1992—0765

AGRICO
Division of Freeport-McMoRan Resource Partners

Agrico Chemical Company
P. O. Box 1110
Mulberry, FL 33860
(813) 428-1431

RECEIVED
MAR 25 1992
Division of Air
Resources Management

March 19, 1992

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Preston Lewis
Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Re: Comments on Draft Permits
AC53-201152 and AC53-199112 (PSD-FL-179)

Dear Mr. Lewis:

The following comments are submitted on the proposed permits referenced above. In addition, we also submit proof of publication of the Notice of Intent to Issue Permits associated with this project.

1. Permit No. AC53-201152:
Molten Sulfur Storage and Handling System

   a) A typographical error concerning the storage capacity of the truck pit should be corrected to reflect 670 ST instead of 600 ST in the project description on page 1 of the above permit.

   b) We feel the language of Specific Condition No. 8 is overly broad and, as a practical matter, would require Agrico to notify the Department of routine maintenance and/or replacement of equipment with identical specifications. We suggest the notification be triggered by any change which would reasonably be expected to result in an increase in emissions.

2. Permit No. AC53-199112:
Sulfuric Acid Plants Nos. 10 and 11

   A typographical error concerning the sulfuric acid production rate should be corrected in Specific Condition No. 7 on page 6 from TPH to TPD.

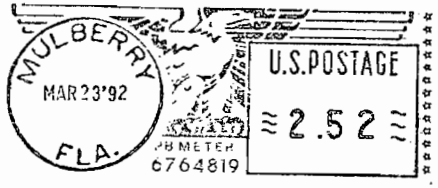
AGRICO
Division of Freeport-McMoRan Resource Partners

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

CERTIFIED

P 670 516 058

MAIL



Mr. Preston Lewis
Florida Department of Environmental
Regulation
2600 Blair Stone Road
Tallahassee, FL 32399-2400

SENDER:

- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt Fee will provide you the signature of the person delivered to and the date of delivery.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:

Mr. Delwyn Presnell
Agrico Chem. Co.
PO Box 1110
Mulberry, Fl 33860

4a. Article Number
P 710 058 460

4b. Service Type
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery
4-23-92

5. Signature (Addressee)

6. Signature (Agent)

8. Addressee's Address (Only if requested and fee is paid)

PS Form **3811**, November 1990 ☆U.S. GPO: 1991—287-066 **DOMESTIC RETURN RECEIPT**

P 872 562 494

Receipt for Certified Mail
No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

UNITED STATES POSTAL SERVICE

PS Form **3800,** JUNE 1991

Sent to	Mr. J. M. Baretincic
Street and No.	P. O. Box 2005
P.O. State and ZIP Code	Mulberry, FL 33860-1200
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	Mailed: 11/08/93 AC53-199112 AC53-222859

Is your **RETURN ADDRESS** completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Mr. J. M. Baretincic
Director - Environmental Services
IMC Agrico Company
P. O. Box 2005
Mulberry, Florida 33860-1200

4a. Article Number
P 872 562 494

4b. Service Type
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery

5. Signature (Addressee)

8. Addressee's Address (Only if requested and fee is paid)

6. Signature (Agent)

PS Form **3811,** December 1991 ☆U.S. GPO: 1992—323-402 **DOMESTIC RETURN RECEIPT**

Thank you for using Return Receipt Service.

BEST AVAILABLE COPY

John, For your review.

OK
FO
NOTE: 2 Separate permit revisions.

Florida Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

November 18, 1993

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. J. M. Baretincic
Director - Environmental Services
IMC Agrico Company
P. O. Box 2005
Mulberry, Florida 33860-1200

Re: AC53-199112 (Modification of No. 10 & 11 Sulfuric Acid Plants)

Dear Mr. Baretincic:

The Department received your November 12 letter requesting an extension of the subject permit. The request is acceptable and the permit is amended as shown:

Permit No. AC 53-199112

Current Expiration Date: January 1, 1994
New Expiration Date: July 1, 1995

This letter shall become an attachment to this permit.

A person 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 contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400. Petitions filed by the applicant of the amendment request/application and the parties listed below must be filed within 14 days of receipt of this amendment. Petitions filed by other persons must be filed within 14 days of the amendment issuance or within 14 days of their receipt of this amendment, whichever occurs first. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

Printed on recycled paper.

P 062 921 918

Receipt for Certified Mail

No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

UNITED STATES POSTAL SERVICE

Sent to: Phillip Headham	
Street and No. Asico Chem. Co	
P.O., State and ZIP Code Mulberry, Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date AC53-199112 PSD-FI-179 11-9-92	

PS Form **3800**, June 1991

PS Form 3811, July 1983 447-845

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. Phillip Headham
Asico Chemical Co.
P O Box 1110
Mulberry, Fl 33860

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

Article Number
P062 921 918

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature – Addressee
X

6. Signature – Agent
X Kathy Hallaway

7. Date of Delivery
11-12-92

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

DOMESTIC RETURN RECEIPT

Check Sheet

Company Name: Agrico Chem. Co.
Permit Number: AC 53-199112
PSD Number: PSD-FL-179
County: POLK
Permit Engineer: WILLARD HANKS
Others involved: CLEVE HOLLADAY, Tom ROGERS

Application:

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

Intent:

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

  Attachments:
  - [x]
  - [ ]
  - [ ]

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

Final Determination:

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

Post Permit Correspondence:

- [x] Extensions
- [x] Amendments/Modifications
- [ ] Response from EPA
- [ ] Response from County
- [ ] Response from Park Services
- [ ] Response from Fish & Wildlife

Agrico Chemical Company
P.O. Box 1110
Mulberry, FL 33860
(813) 428-2613

№ 04069

Date Shipped: 6-26-91
Shipped Via: UPS
Collect ☐ Prepaid ☑

SHIP TO: Mr C.H. Fancy
FLA Dept of Environmental Reg
Twin Towers office BLDG
2600 BLAIR STONE Rd
TALLAHASSEE FL 32399-2400

Vendor Invoice/Credit Memo:
Agrico P. O. # Req # 039038
Account #
Shipment Requested by: Phil STEADHAM

Quantity	Unit	Description
1	EA	Box Permit APPLICATIONS

Shipped By: Henry Kirkland 6/26/91 Consignee/Common Carrier UPS

Reason for Shipment:

☐ Obsolete/Surplus Material
☐ Overshipment/Wrong Destination
☐ Scrap: Weight In.
☐ Other:

Vendor Action:

☐ Replacement
☐ Credit
☐ Repair
☐ See P. O. #

AGRICO
Division of Freeport-McMoRan Resource Partners

RECEIVED
JUN 28 1991
Division of Air Resources Management

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

Mr. C.H. Fancy
Florida Department of
Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

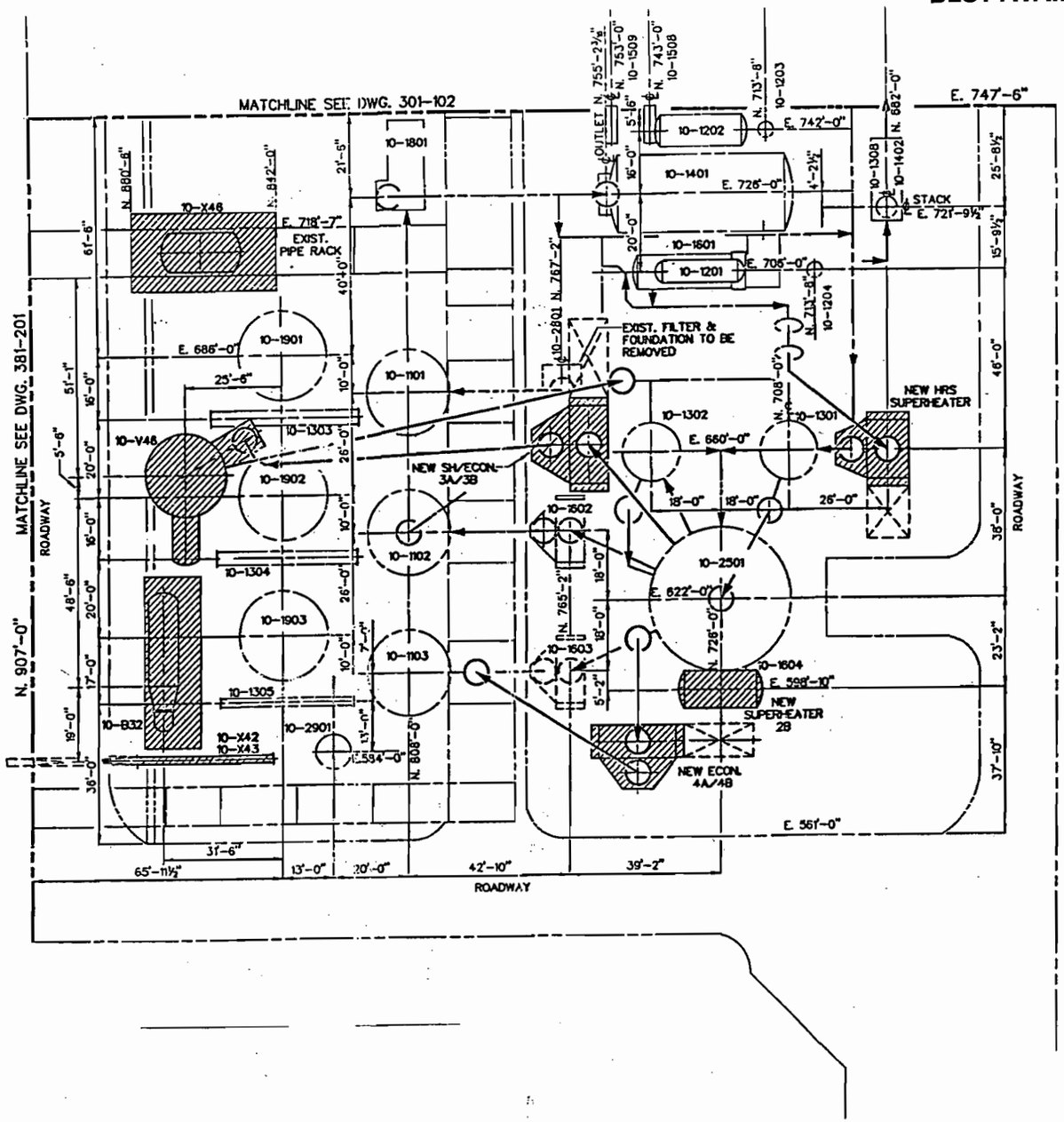
AIR

15 LBS 32399

DELIVERY CONFIRMATION D052 5452 977 PLACE ON PACKAGE NEXT TO SHIPPER NUMBER

1 Copy - Accounting - White
1 Copy - Hold Numerical - Yellow
1 Copy - W/H P. O.: File - Pink

BEST AVAILABLE COPY



EQUIPMENT LIST
(MAJOR EQUIPMENT ONLY)

NUMBER	DESCRIPTION	REMARKS
10-1101	DRYING TOWER	(EXISTING)
10-1102	NO. 1 ABSORPTION TOWER	(REMOVE)
10-1103	NO. 2 ABSORPTION TOWER	(EXISTING)
10-1301	HEAT EXCHANGER	(EXISTING)
10-1302	HEAT EXCHANGER	(EXISTING)
10-1303	DRYING TOWER ACID COOLER	(EXISTING)
10-1304	NO. 1 ABSORPTION TOWER ACID COOLER	(REMOVE)
10-1305	NO. 2 ABSORPTION TOWER ACID COOLER	(EXISTING)
10-1602	HEAT EXCHANGER	(REMOVE)
10-1603	HEAT EXCHANGER	(REMOVE)
10-1604	SUPER HEATER	(REMOVE)
10-1901	DRYING TOWER ACID PUMP TANK	(EXISTING)
10-1902	NO. 1 ABSORPTION TOWER ACID PUMP TANK	(REMOVE)
10-1903	NO. 2 ABSORPTION TOWER ACID PUMP TANK	(EXISTING)
10-2501	CONVERTER	(EXISTING)
10-2801	AIR FILTER	(REMOVE)
	SUPERHEATER/ECONOMIZER 3A/3B	NEW
	ECONOMIZER 4A/4B	NEW
	SUPERHEATER 2B	NEW
	HRS SUPERHEATER	NEW
10-B32	HRS BOILER	NEW
10-P11A/B	HP BOILER FEED WATER PUMPS	NEW - NOT SHOWN
10-P39	HRS CIRC. PUMP	NEW - NOT SHOWN
10-P40A/B	HRS DRAIN PUMPS	NEW - NOT SHOWN
10-P41A/B	HRS BOILER FEED WATER PUMPS	NEW - NOT SHOWN
10-V46	HRS TOWER/PUMP BOOT	NEW
10-X42	HRS HEATER	NEW
10-X43	HRS PREHEATER	NEW
10-X46	HRS DEAERATOR	NEW
10-Z48	HRS DILUTER	NEW - NOT SHOWN

NOTE:
NEW EQUIPMENT IS HIGHLIGHTED WITH CROSSHATCHING

FIGURE 3-1A

PROCESS FLOW DIAGRAM

REVISIONS | NO. | DATE | DESCRIPTION | BY | APP'D

REFERENCES | DESCRIPTION

THIS DRAWING IS THE PROPERTY OF
MONSANTO ENVIRO-CHEM SYSTEMS INC
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PROPOSAL

MONSANTO ENVIRO-CHEM SYSTEMS, INC.
ST. LOUIS, MISSOURI

PLANT LAYOUT
SULFURIC ACID UNIT #10
AGRICO CHEMICAL CO. SOUTH PIERCE, FL.

	BY	DATE	APP'D.	DATE	JOB NO.	REVISION
DRAWN	DLM	3/91			2647	A
CHECKED					DRAWING NO. 301-101	

DEPARTMENT OF ENVIRONMENTAL REGULATION

ROUTING AND TRANSMITTAL SLIP

ACTION NO

ACTION DUE DATE

1. TO: (NAME, OFFICE, LOCATION) WILLARD HANKS	Initial	
	Date	
2. Bureau of Air Regulation Tallahassee	Initial	
	Date	
3.	Initial	
	Date	
4.	Initial	
	Date	

REMARKS:

INFORMATION	
	Review & Return
	Review & File
	Initial & Forward

DISPOSITION	
	Review & Respond
	Prepare Response
	For My Signature
	For Your Signature
	Let's Discuss
	Set Up Meeting
	Investigate & Report
	Initial & Forward
	Distribute
	Concurrence
	For Processing
	Initial & Return

FROM: Gary Maier

DATE 7-23-91

PHONE Suncom 552-7612 ext 408

Best Available Copy

P 832 538 663

Certified Mail Receipt

No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

UNITED STATES POSTAL SERVICE

Sent to Selwyn Presnell, Agrico Chem.	
Street & No. P. O. Box 1110	
P.O., State & ZIP Code Mulberry, FL 33860	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Address of Delivery	
TOTAL Postage & Fees	$
Postmark or Date Mailed: 7-26-91 Permit: AC 53-199112 PSD-FL-179	

PS Form 3800, June 1990

SENDER:

- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece next to the article number.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:

Mr. Selwyn Presnell
Environmental Manager
Agrico Chemical Company
P. O. Box 1110
Mulberry, FL 33860

4a. Article Number
P 832 538 663

4b. Service Type
☐ Registered ☐ I... ured
☒ Certi... d ☐ C...
☐ Expr...

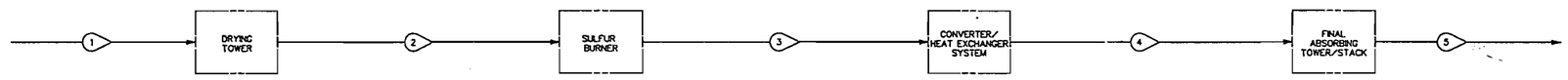
7. Date
7-3(

5. Signature (Addressee)

8. Add... s Address (...ly if requested and ...ee is paid)

6. Signature (Agent)

PS Form 3811, October 1990 ☆U.S. GPO: 1990—273-861 **DOMESTIC RETURN RECEIPT**



STREAM NUMBER / COMPONENT		1	2	3	4	5
SO_2	SCFM	0	0	13,532	41	41
SO_3	SCFM	0	0	237	838	0
O_2	SCFM	24,387	24,387	10,500	3,755	3,755
N_2	SCFM	92,301	92,301	92,301	92,301	92,301
H_2O	SCFM	3,734	0	0	0	0
TOTAL	SCFM	120,422	116,688	116,570	96,935	96,097
TOTAL	LBS/HR	573,759	562,520	636,291	463,843	452,629

CASE 2700 TPD (CALCULATED)
11.8# SO_2
4 LB SO_2 /TON ACID (100%)
430 PPM

NOTES:

STANDARD CONDITIONS: 0°C/32°F AND 14.7 PSIA

REVISIONS

NO.	DATE	DESCRIPTION	BY	BY	BY

REFERENCE DRAWINGS

THIS DRAWING IS THE PROPERTY OF MONSANTO ENVIRO-CHEM SYSTEMS INC
INFORMATION AND KNOW HOW HEREON ARE CONFIDENTIAL AND MAY NOT BE USED, REPRODUCED OR REVEALED TO OTHERS EXCEPT IN ACCORD WITH CONTRACT. NEITHER RECEIPT NOR POSSESSION OF THIS DRAWING NOR ITS CONTENTS CONVEYS ANY RIGHTS TO REPRODUCE OR USE IT WITHOUT WRITTEN PERMISSION. REPRODUCTION OF SHOP DRAWINGS SHALL BEAR OR REFER TO THIS STAMP.

ISSUE DATE	CLIENT PERMITTING PURPOSE OF ISSUE

MONSANTO ENVIRO-CHEM SYSTEMS, INC.
ST. LOUIS, MISSOURI

JOB NO. 2647 | MEC DRAWING NO. 311-153

AGRICO
Division of Freeport – McMoran Resource Partners

SOUTH PIERCE COGENERATION

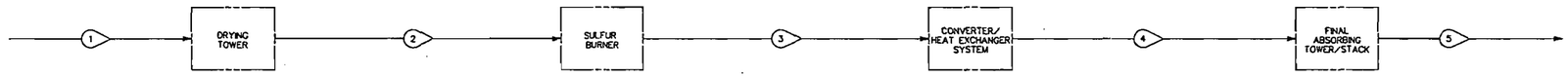
PLANT 10 BLOCK FLOW DIAGRAM

DESIGNED MAA 5/91 | APPROVED
CHECKED JWR 5/91 | APPROVED

SCALE NONE | AGRICO DRAWING NO. 35 04 00 505 A

2647.311153

AS BUILT



STREAM NUMBER / COMPONENT		1	2	3	4	5
SO_2	SCFM	0	0	13,532	41	41
SO_3	SCFM	0	0	237	838	0
O_2	SCFM	24,387	24,387	10,500	3,755	3,755
N_2	SCFM	92,301	92,301	92,301	92,301	92,301
H_2O	SCFM	3,734	0	0	0	0
TOTAL	SCFM	120,422	116,688	116,570	96,935	96,097
TOTAL	LBS/HR	573,759	562,520	636,291	463,843	452,629

CASE 2700 TPD (CALCULATED)
11.8% SO_2
4 LB SO_2 /TON ACID (100%)
430 PPM

NOTES:
STANDARD CONDITIONS: 0°C/32°F AND 14.7 PSIA

REVISIONS

NO.	DATE	DESCRIPTION	BY	BY	BY

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AGRICO
Division of Freeport – McMoran Resource Partners

SOUTH PIERCE COGENERATION

PLANT 11
BLOCK FLOW DIAGRAM

DESIGNED SRSA 9/91 | APPROVED
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