July 27, 1995

Mr. Al Linero, P.E.
Bureau of Air Regulation
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Re: Cargill Fertilizer, Inc.
Bartow Nos. 4, 5 and 6 Sulfuric Acid Plants
AC53-271436; PSD-FL-229

Dear Mr. Linero:

This letter is in response to the Department's letters dated June 19 and June 29, 1995, regarding the above referenced permits. Responses are provided below in the same order as presented in the Department's letters.

June 19 Letter

1. The emissions from the 3,000 ton tank are greater than the emissions from the 7,500 ton tank because, to be conservative, it was assumed that a much greater amount of molten sulfur is sent through the 3,000 ton tank. By assuming that a much greater quantity of sulfur is processed through the 3,00 ton tank, the operating hours per year are increased. Also, since the 3,000 ton tank has five vents compared to one vent for the 7,500 ton tank, the ventilation rate of the 3,000 ton tank is greater, thereby increasing emissions. These assumptions result in higher emissions for the 3,000 ton tank and compared to the 7,500 ton tank, and also results in overall higher hourly and annual emissions from the molten sulfur handling system.

2. Cargill is currently sending a portion of the sulfuric acid produced at Riverview to the Bartow facility. After the Bartow expansion, this will cease. Therefore, the Riverview sulfuric acid plants may experience a decrease in acid production, or may use the additional acid to support increased phosphoric acid production at Riverview. Cargill will be submitting an application for increased phosphoric acid production at Riverview in the near future.

3. A copy of the quotation from Monsanto is attached as Attachment A.

4. The statistical analysis of SO_2 data from the sulfuric acid plants have been reviewed, and some inadvertent errors were discovered. A revised analysis is attached as Attachment B. The revised analysis shows that the 95 percent confidence level exceeds the 4.0 lb/ton limit for only the No. 5 sulfuric acid plant. However, Cargill implements immediate corrective measures if the continuous monitors indicate levels near the limit. If these measures are not effective, and the limit is in danger of being exceeded, Cargill requires the operators to immediately shutdown the plant. Also, the physical modifications to the plants described on page 2-11 of the application are designed to achieve the 4.0 lb/ton limit at the higher production rates.

5. Questions concerning the modeling analysis are addressed in the responses to the June 29 completeness letter.

June 29 Letter

1. The 3-hour limits are proposed only because there is a 3-hour SO_2 air quality standard. The limits are the same for the 3-hour, 24-hour and annual averaging times.

KBN ENGINEERING AND APPLIED SCIENCES, INC.

6241 Northwest 23rd Street, Suite 500, Gainesville, Florida 32653-1500, 904-336-5600 FAX 904-336-6603
5405 West Cypress Street, Suite 215, Tampa, Florida 33607, 813-287-1717 FAX 813-287-1716
1801 Clint Moore Road, Suite 105, Boca Raton, Florida 33487, 407-994-9910, FAX 407-994-9393
7785 Baymeadows Way, Suite 105, Jacksonville, Florida 32256, 904-739-5600 FAX 904-739-7777
1616 'P' Street N.W., Suite 450, Washington, D.C. 20036, 202-462-1100, FAX 202-462-2270

2. The 7,500 ton storage tank has not yet been designed. However, a 7,500 ton molten sulfur storage tank will require a tank of approximately 1 million gallon capacity. A tank of dimensions 40 feet tall by 65 feet in diameter would hold approximately 1 million gallons. The ambient impacts from the molten storage handling system are evaluated in Attachment C.

3. The National Park Service's comments are discussed below.

Air Quality Modeling Analysis

The SO_2 emission sources used for the PSD Class I incremental analysis in the PSD Application were based on a previous but recent PSD Class I modeling analysis for the Chassahowitzka NWR. The emission inventory was brought up-to-date with the assistance of the FDEP. No screening of emission sources was performed for this analysis.

Impacts of H_2SO_4 emissions upon the Chassahowitzka WA were addressed on page 7-15 of the application (Section 7.2.3). The analysis demonstrated no adverse effects upon the Class I area.

Air Quality Related Values Analysis

A revised VISCREEN analysis is attached as Attachment D. Revised analysis shows no significant impact upon the Class I area.

A regional haze analysis has been performed as is provided in Attachment E. The analysis was conducted according to instructions by the National Park Service. The analysis shows that no significant impact upon regional haze at the Class I area as a result of the Cargill modification.

Please call me or Steve Marks (regarding modeling analysis) if you have any further questions concerning this additional information.

Sincerely,

David A. Buff

David A. Buff, P.E.
Principal Engineer
Florida P.E. # 19011

SEAL

cc: David Jellerson
J. Harper, EPA
J. Bunyak, NPS
B. Thomas, FDEP/SWD
S. Marks, KBN
File (2)

DABuff/ehj

Cleve Holladay (BAR)
Syed Arif
Linda Novak, Polk Co.

ATTACHMENT A

MONSANTO QUOTATION FOR FGD SYSTEM

Monsanto Enviro-Chem

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

April 19, 1994

Mr. David Buff
KBN Engineering
1034 Northwest 57th Street
Gainesville, FL 32605-4482
FAX: 904-332-4189

Re: *DynaWave*® Scrubber Proposal, MCD-1757

Dear David:

We are pleased to offer Monsanto's *DynaWave* scrubber to reduce the SO_2 emissions from sulfuric acid plants. Per your request, I've put together budgetary information for two plants, 2900 T/D and 3200 T/D with the following simplified design basis:

	2900 T/D	3200 T/D
Gas flowrate, ACFM	150,000	165,000
Temperature, °F	150	150
Inlet SO_2, lb/hr	483	533

The heart of the *DynaWave* system is the Reverse Jet, a gas-to-liquid contactor that creates a zone of intense mixing. The feed gas stream enters the top of a vertical duct and collides with the scrubbing liquid which is injected upward through a large bore injector. A standing wave of highly turbulent flow is created at the point the liquid is reversed by the gas. This region is called the Froth Zone. In this zone, a very high rate of liquid surface renewal efficiently quenches the gas, while providing particulate removal and gas contaminant absorption. The proposed systems include one or two Reverse Jets.

DynaWave scrubbers were invented to solve air pollution control problems requiring reliable operation with dirty, hot gases. *DynaWave* scrubbers are an excellent fit with tough gas cleaning applications because they are able to operate reliably in dirty environments with high collection efficiencies. The scrubbers utilize large diameter liquid injectors and nonrestrictive, open vessels. This allows routine operation with scrubbing slurries such as lime, limestone or magnesium hydroxide without pluggage or downtime.

I looked at three reagents - caustic, limestone and ammonia and have summarized the results in two tables that are attached.

The advantage of ammonia scrubbing is that it produces a by-product (ammonium sulfate) which may be marketable as fertilizer. The disadvantage is that, due to the high vapor pressure of ammonia, a ga phase reaction between SO_2 and ammonia produces a very fine solid particulate (ammonium sulfite/bisulfite). To prevent a visible plume due to this particulate, the gas from the scrubber must pass through a high efficiency mist eliminator where the particulate is removed and dissolved in collected liquid mist. The mist eliminators and the vessel to hold them increase the capital investment significantly.

The advantage of sodium scrubbing is that it does not involve the formation of the fine solid particulate and, therefore, does not require high efficiency mist elimination. A simple chevron is sufficient.

The advantage of limestone scrubbing is the relatively low cost of limestone as compared to caustic and ammonia. However, it involves the problem of handling slurries and disposal of a waste product (calcium sulfite/bisulfite).

I will send you some additional background information on *DynaWave* scrubbers, including write-ups on installed *DynaWave* scrubbers that use ammonia for sulfuric acid plant tail gas scrubbing and limestone for cement kiln offgas scrubbing.

I hope this gives you a good start at looking at the alternatives. Please feel free to call m e at 314-275-5932. Our sales manager, Steve Williams, is located just outside Tampa. He would be happy to visit and discuss this proposal with you. Steve's phone number is 813-661-2284. We look forward to working together.

Best regards,

Deli Schleiffarth

Deli Schleiffarth
DynaWave® Sales Engineer

cc: SRW
JRH
JWS
JJT
JRS
SSM
SMP
MEA

File: KBN, MCD-1757, Proposal

H:\PROPOSAL\W1757P01.WPF

Cargill Tail Gas Scrubber Options
Plant #1 - 2900 TPD

	Caustic $NaOH$	Limestone $CaCO_3$	Ammonia NH_3
System Configuration	RJ	RJ>RJ	RJ>RJ>MME
Efficiency / exit SO_2 Concentration	95% lower limit = 10 ppm	90% lower limit = 10 ppm	50 ppm
Budget Price	$1,000,000	$1,400,000	$2,500,000
Scope of Supply	Single stage *DynaWave* scrubber plus circulation pump and instrumentation	Two stage *DynaWave* scrubber plus circulation pumps and instrumentation	Two stage *DynaWave* scrubber, mist eliminators and vessel, circulation pump and instrumentation
Pressure drop	8" wc	24" wc	26" wc
Reagent consumption	574 lb/hr	1017 lb/hr	350 lb/hr
Circulation rate	4500 gpm	7500 gpm per Reverse Jet	3800 gpm per Reverse Jet

Caustic Reactions

$SO_2 + 2NaOH \rightarrow Na_2SO_3 + H_2O$
$SO_2 + 2NaOH + 0.5\ O_2 \rightarrow Na_2SO_4 + H_2O$

Limestone Reactions

$SO_2 + CaCO_3 \rightarrow CaSO_3 + CO_2$
$SO_2 + CaCO_3 + 0.5\ O_2 \rightarrow CaSO_4 + CO_2$

Ammonia Reactions

$SO_2 + NH_3 + H_2O \rightarrow (NH_4)_2SO_3$
$SO_2 + H_2O + (NH_4)_2SO_3 \rightleftharpoons 2NH_4HSO_3$
$NH_3 + NH_4HSO_3 \rightleftharpoons (NH_4)_2SO_3$

Cargill Tail Gas Scrubber Options
Plant #1 - 3200 TPD

	Caustic $NaOH$	Limestone $CaCO_3$	Ammonia NH_3
System Configuration	RJ	RJ>RJ	RJ>RJ>MME
Efficiency / exit SO_2 Concentration	95% lower limit = 10 ppm	90% lower limit = 10 ppm	50 ppm
Budget Price	$1,200,000	$1,600,000	$2,800,000
Scope of Supply	Single stage *DynaWave* scrubber plus circulation pump and instrumentation	Two stage *DynaWave* scrubber plus circulation pumps and instrumentation	Two stage *DynaWave* scrubber, mist eliminators and vessel, circulation pump and instrumentation
Pressure drop	8" wc	24" wc	26" wc
Reagent consumption	633 lb/hr	1078 lb/hr	372 lb/hr
Circulation rate	4800 gpm	8000 gpm per Reverse Jet	4000 gpm per Reverse Jet

Caustic Reactions

$SO_2 + 2NaOH \rightarrow Na_2SO_3 + H_2O$
$SO_2 + 2NaOH + 0.5\ O_2 \rightarrow Na_2SO_4 + H_2O$

Limestone Reactions

$SO_2 + CaCO_3 \rightarrow CaSO_3 + CO_2$
$SO_2 + CaCO_3 + 0.5\ O_2 \rightarrow CaSO_4 + CO_2$

Ammonia Reactions

$SO_2 + NH_3 + H_2O \rightarrow (NH_4)_2SO_3$
$SO_2 + H_2O + (NH_4)_2SO_3 \rightleftharpoons 2NH_4HSO_3$
$NH_3 + NH_4HSO_3 \rightleftharpoons (NH_4)_2SO_3$

ATTACHMENT B

REVISED STATISTICAL ANALYSIS OF SO_2 DATA

FOR NOS. 4, 5, AND 6 SULFURIC ACID PLANTS

Continuous SO2 Emission Data -- Recalculated

#4 Sulfuric Acid Plant

	Original Data SO2 Emissions (lb/ton) from Table B-1	Recalculated SO2 Emissions (lb/ton)
Sum		431
Number	169	157
Max	3.67	3.67
Avg	2.55	2.74
Std Dev	0.88	0.55
95% CI	4.27	3.81

#5 Sulfuric Acid Plant

	Original Data SO2 Emissions (lb/ton) from Table B-2	Recalculated SO2 Emissions (lb/ton)
Sum		591
Number	203	191
Max	3.83	3.83
Avg	2.91	3.09
Std Dev	0.95	0.62
95% CI	4.77	4.31

#6 Sulfuric Acid Plant

	Original Data SO2 Emissions (lb/ton) from Table B-3	Recalculated SO2 Emissions (lb/ton)
Sum		600
Number	192	180
Max	3.78	3.78
Avg	3.13	3.33
Std Dev	0.84	0.24
95% CI	4.77	3.81

Text was included in the range that the spreadsheed calculated; therefore twelve values of zero were in used the original calculations.

Table B-1
SO2 emissions from #4 Sulfuric Acid Plant
Cargill Fertilizer, Inc. Bartow, FL

Date	#4 Plant SO2 emissions (ppm)	%O2 (%)	SO2 emissions (lb/ton)	Plant Down? *
11/19/94	344.58	4.4	3.22	
11/20/94	275.67	4.63	2.61	
11/21/94	352.04	4.4	3.29	
11/22/94	351.96	4.4	3.29	
11/23/94	345.42	4.4	3.23	
11/24/94	351.25	4.4	3.28	
11/25/94	357.42	4.4	3.34	
11/26/94	348.29	4.4	3.26	
11/27/94	351.79	4.4	3.29	
11/28/94	349.33	4.4	3.27	
11/29/94	344.29	4.45	3.23	
11/30/94	340.17	4.5	3.20	
12/01/94	343.46	4.4	3.21	
12/02/94	345.79	4.4	3.23	
12/03/94	342.04	4.4	3.20	
12/04/94	346.96	4.4	3.24	
12/05/94	349.46	4.4	3.27	
12/06/94	356.42	4.4	3.33	
12/07/94	359.63	4.4	3.36	
12/08/94	363.00	4.4	3.39	
12/09/94	359.46	4.4	3.36	
12/10/94	333.71	4.3	3.10	
12/11/94	344.54	4.3	3.20	
12/12/94	336.04	4.3	3.12	
12/13/94	333.46	4.3	3.10	
12/14/94	326.17	4.3	3.03	
12/15/94	-----	-----		Yes
12/16/94	-----	-----		Yes
12/17/94	381.92	4.3	3.55	
12/18/94	376.42	4.3	3.50	
12/19/94	375.88	4.3	3.49	
		Total	431	
		Number	157	
		Max	3.67	
		Avg	2.74	
		Std dev	0.55	
		95% CI	3.81	

Note: * Yes = Plant downtime occurred on this day.
95% CI = (1.96 x Std dev) + Avg

Table B-2
SO2 emissions from #5 Sulfuric Acid Plant
Cargill Fertilizer, Inc. Bartow, FL

Date	#5 Plant SO2 emissions (ppm)	%O2 (%)	SO2 emissions (lb/ton)	Plant Down? *
11/19/94	401.96	3.9	3.65	
11/20/94	392.54	3.9	3.56	
11/21/94	-----	-----		Yes
11/22/94	373.71	4	3.41	
11/23/94	361.50	4	3.30	
11/24/94	364.21	4.1	3.34	
11/25/94	362.17	4.1	3.33	
11/26/94	356.83	4.1	3.28	
11/27/94	354.29	4.1	3.25	
11/28/94	354.46	4.1	3.25	
11/29/94	357.88	4.1	3.29	
11/30/94	350.08	4.2	3.23	
12/01/94	342.96	4.1	3.15	
12/02/94	371.46	4	3.39	
12/03/94	373.42	4	3.41	
12/04/94	373.33	4	3.41	
12/05/94	371.83	4	3.39	
12/06/94	-----	-----		Yes
12/07/94	-----	-----		Yes
12/08/94	276.12	4.4	2.58	
12/09/94	249.21	4.4	2.33	
12/10/94	-----	-----		Yes
12/11/94	244.83	4.6	2.32	
12/12/94	238.50	4.5	2.24	
12/13/94	243.88	4.5	2.29	
12/14/94	247.21	4.5	2.32	
12/15/94	246.17	4.5	2.31	
12/16/94	245.00	4.5	2.30	
12/17/94	250.08	4.5	2.35	
12/18/94	249.04	4.5	2.34	
12/19/94	247.29	4.4	2.31	
		Total	591	
		Number	191	
		Max	3.83	
		Avg	3.09	
		Std dev	0.62	
		95% CI	4.31	

Note: * Yes = Plant downtime occurred on this day.
95% CI = (1.96 x Std dev) + Avg

Table B-3
SO2 emissions from #6 Sulfuric Acid Plant
Cargill Fertilizer, Inc. Bartow, FL

Date	#6 Plant SO2 emissions (ppm)	%O2 (%)	SO2 emissions (lb/ton)	Plant Down? *
11/19/94	383.04	4.3	3.56	
11/20/94	373.54	4.4	3.49	
11/21/94	367.08	4.4	3.43	
11/22/94	361.25	4.3	3.36	
11/23/94	348.29	4.4	3.26	
11/24/94	363.33	4.25	3.37	
11/25/94	345.71	4.3	3.21	
11/26/94	353.54	4.3	3.28	
11/27/94	359.38	4.2	3.32	
11/28/94	365.08	4.2	3.37	
11/29/94	358.50	4.2	3.31	
11/30/94	348.46	4.2	3.22	
12/01/94	358.79	4.4	3.35	
12/02/94	349.54	4.35	3.26	
12/03/94	357.04	4.25	3.31	
12/04/94	358.13	4.27	3.32	
12/05/94	365.25	4.25	3.38	
12/06/94	369.00	4.2	3.41	
12/07/94	384.38	4.2	3.55	
12/08/94	378.46	4.4	3.54	
12/09/94	378.08	4.3	3.51	
12/10/94	-----	-----		Yes
12/11/94	351.21	4.4	3.28	
12/12/94	357.08	4.2	3.30	
12/13/94	349.33	4.3	3.25	
12/14/94	-----	-----		Yes
12/15/94	361.54	4.1	3.32	
12/16/94	380.25	4.2	3.51	
12/17/94	379.38	4.2	3.50	
12/18/94	390.63	4.15	3.60	
12/19/94	386.50	4.2	3.57	
		Total	600	
		Number	180	
		Max	3.78	
		Avg	3.33	
		Std dev	0.24	
		95% CI	3.81	

Note: * Yes = Plant downtime occurred on this day.
95% CI = (1.96 x Std dev) + Avg

ATTACHMENT C

AMBIENT IMPACTS OF MOLTEN SULFUR HANDLING SYSTEM

ATTACHMENT C
AMBIENT AIR QUALITY IMPACTS OF THE MOLTEN SULFUR HANDLING FACILITY

The maximum ambient air quality impacts for Cargill Bartow's molten sulfur handling facility (MSHF) were determined using the modeling approach outlined in Section 6.0 of the PSD Permit Application. All MSHF impacts are based on the proposed expanded MSHF, which is described in Section 2.2.2 of the PSD permit application. The proposed sources include molten sulfur Pits A and B, and 3,000 and 7,500 ton tanks. The MSHF will result in emissions of sulfur dioxide (SO_2), sulfur particles (PM), and total reduced sulfur (TRS) (as hydrogen sulfide, H_2S). The maximum SO_2 and PM impacts were compared to the EPA Significant Impact Levels. The maximum TRS impacts were compared to the Florida Air Reference Concentrations (FARC). The maximum emission rates presented in Table 2-3 of the application were used for all ambient air quality impacts.

Stack parameters for these sources are presented on Attachment EU4-1 of the Air Permit Application Long Form. As a building downwash analysis indicated that the MSHF sources, located as in Figure 2-2 of the application, are not affected by any of Cargill's buildings, the effects of building downwash were not considered.

The SO_2 modeling results for the screening analysis are presented in Table C-1. Based on the screening modeling results, both 24- and 3-hour refinements were performed. The SO_2 refined analysis results are compared with the EPA significant impact levels in Table C-2. The maximum predicted annual, 24-hour and 3-hour SO_2 impacts are 0.33, 4.26, and 20.45 $\mu g/m^3$, respectively. These impacts are less than the significant impact levels of 1, 5, and 25 $\mu g/m^3$, respectively.

The PM modeling results for the screening analysis are presented in Table C-3. Based on the screening modeling results, further refinements were not performed. The maximum predicted annual and 24-hour PM impacts are 0.13 and 1.64 $\mu g/m^3$, respectively. These impacts are well below the respective significant impact levels of 1 and 5 $\mu g/m^3$.

The TRS modeling results for the screening analysis are presented in Table C-4. Based on the screening modeling results, further refinements were not performed. The maximum predicted annual, 24-hour and 8-hour TRS impacts are 0.16, 2.04, and 4.57 $\mu g/m^3$, respectively. These impacts are less than the H_2S FARCs of 0.9, 33.6, and 140 $\mu g/m^3$, respectively.

Table C-1. Maximum Predicted SO_2 Concentrations for the Modified Molten Sulfur Facility - Screening Analysis

Averaging Time	Concentration ($\mu g/m^3$)	Receptor Location[a] Direction (degrees)	Receptor Location[a] Distance (m)	Period Ending (YYMMDDHH)
Annual	0.29	250.	2092.	82123124
	0.27	250.	2092.	83123124
	0.33	260.	1996.	84123124
	0.32	260.	1996.	85123124
	0.28	250.	2092.	86123124
24-Hour High	3.26	260.	2000.	82012924
	3.96	140.	1179.	83011524
	3.31	180.	1142.	84010324
	4.13	120.	1460.	85051824
	4.26	220.	1481.	86101724
24-Hour HSH	2.31	140.	1179.	82081224
	2.93	120.	1460.	83011124
	3.02	230.	1761.	84102524
	3.11	120.	1460.	85092724
	3.48	220.	1481.	86102024
3-Hour High	16.8	130.	1265.	82031803
	17.2	120.	1460.	83071803
	16.4	160.	1500.	84060224
	16.0	230.	1761.	85070806
	17.2	230.	1265.	86071524
3-Hour HSH	14.2	140.	1179.	82081224
	14.8	140.	1179.	83072224
	14.0	230.	1761.	84100306
	12.9	170.	1160.	85122021
	12.9	230.	1761.	86012124

Note: YY=Year, MM=Month, DD=Day, HH=Hour, HSH = Highest, Second-Highest.

[a] All receptor coordinates are reported with respect the DAP #4 stack location.

Table C-2. Maximum Predicted SO_2 Concentrations for the Modified Molten Sulfur Facility - Refined Analysis

Averaging Time	Concentration ($\mu g/m^3$)	Receptor Locations[a]		Period Ending (YYMMDDHH)	EPA Significant Impact Level ($\mu g/m^3$)
		Direction (degrees)	Distance (m)		
Annual	0.33	260	1,996	84123124	1
24-Hour[b]	4.13	120	1,460	85051824	5
	4.26	220	1,481	86101724	
3-Hour[b]	20.45	122	1,380	83082024	25
		126	1,314	86012024	

Note: YY= Year, MM = Month, DD= Day, HH= Hour

[a] Receptors locations are relative to the DAP No. 4 location.

[b] All short-term concentrations are highest, second-highest concentrations.

Table C-3. Maximum Predicted PM Concentrations for the Modified Molten Sulfur Facility - Screening Analysis

Averaging Time	Concentration ($\mu g/m^3$)	Receptor Location[a] Direction (degreees)	Receptor Location[a] Distance (m)	Period Ending (YYMMDDHH)	EPA Significant Impact Levels ($\mu g/m^3$)
Annual	0.111	250.	2092.	82123124	1
	0.105	250.	2092	83123124	
	0.127	260.	1996.	84123124	
	0.122	260.	1996.	85123124	
	0.108	250.	2092.	86123124	
24-Hour High	1.26	260.	2000.	82012924	5
	1.53	140.	1179.	83011524	
	1.27	180.	1142.	84010324	
	1.59	120.	1460.	85051824	
	1.64	220.	1481.	86101724	
24-Hour HSH	0.89	140.	1179.	82081224	—
	1.13	120.	1460.	83011124	
	1.17	230.	1761.	84102524	
	1.20	120.	1460.	85092724	
	1.34	220.	1481.	86102024	

Note: YY = Year, MM = Month, DD = Day, HH = Hour, HSH = Highest, Second-Highest.

[a] All receptor coordinates are reported with respect to the DAP #4 stack location.

Table C-4. Maximum Predicted TRS/H_2S Concentrations for the Modified Molten Sulfur Facility - Screening Analysis

Averaging Time	Concentration ($\mu g/m^3$)	Receptor Location[a]		Period Ending	Florida Air Reference Concentration ($\mu g/m^3$)
		Direction (degreees)	Distance (m)	(YYMMDDHH)	
Annual	0.138	250.	2092.	82123124	0.9
	0.130	250.	2092.	83123124	
	0.157	260.	1996.	84123124	
	0.151	260.	1996.	85123124	
	0.133	250.	2092.	86123124	
24-Hour High	1.56	260.	2000.	82012924	33.6
	1.90	140.	1179.	83011524	
	1.59	180.	1142.	84010324	
	1.98	120.	1460.	85051824	
	2.04	220.	1481.	86101724	
8-Hour High	4.36	260.	2000.	82012908	140
	4.35	230.	1761.	83102808	
	3.69	140.	2000.	84010424	
	4.57	120.	1460.	85032508	
	3.90	300.	2270.	86040408	

Note: YY = Year, MM = Month, DD = Day, HH = Hour, HSH = Highest, Second-Highest.

[a] All receptor coordinates are reported with respect to the DAP #4 stack location.

ATTACHMENT D

REVISED VISCREEN ANALYSIS

Visual Effects Screening Analysis for
Source: CARGILL BARTOW H2SO4 PLA
Class I Area: CHASSAHOWITZKA NWA

*** Level-1 Screening ***

Input Emissions for

Particulates	.00	TON/YR
NOx (as NO2)	213.50	TON/YR
Primary NO2	.00	TON/YR
Soot	.00	TON/YR
Primary SO4	213.50	TON/YR

**** Default Particle Characteristics Assumed

Transport Scenario Specifications:

Background Ozone:	.04 ppm
Background Visual Range:	65.00 km
Source-Observer Distance:	105.00 km
Min. Source-Class I Distance:	105.00 km
Max. Source-Class I Distance:	124.00 km
Plume-Source-Observer Angle:	11.25 degrees

Stability: 6
Wind Speed: 1.00 m/s

R E S U L T S

Asterisks (*) indicate plume impacts that exceed screening criteria

Maximum Visual Impacts INSIDE Class I Area
Screening Criteria ARE NOT Exceeded

					Delta E		Contrast	
Backgrnd	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume
SKY	10.	84.	105.0	84.	2.00	.291	.05	.004
SKY	140.	84.	105.0	84.	2.00	.169	.05	-.008
TERRAIN	10.	84.	105.0	84.	2.00	.375	.05	.004
TERRAIN	140.	84.	105.0	84.	2.00	.096	.05	.003

Maximum Visual Impacts OUTSIDE Class I Area
Screening Criteria ARE NOT Exceeded

					Delta E		Contrast	
Backgrnd	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume
SKY	10.	60.	96.0	109.	2.00	.309	.05	.004
SKY	140.	60.	96.0	109.	2.00	.184	.05	-.009
TERRAIN	10.	45.	89.3	124.	2.00	.490	.05	.005
TERRAIN	140.	45.	89.3	124.	2.00	.133	.05	.005

ATTACHMENT E

REGIONAL HAZE ANALYSIS

ATTACHMENT E
EFFECT OF CARGILL'S H_2SO_4 PLANT EXPANSION ON REGIONAL HAZE AT THE CHASSAHOWITZKA NWR

A regional haze analysis was conducted to determine if the proposed Cargill sulfuric acid plant expansion would cause a perceptible degradation in visibility at the Chassahowitzka National Wildlife Refuge (CNWR). The CNWR is located approximately 105 kilometers (km) northwest of the Cargill plant. Visibility is an Air Quality Related Value (AQRV) at the CNWR. The visibility of an area is generally characterized by either its visual range, V_r (i.e., the greatest distance that a dark object can be seen) or its extinction coefficient, b_{ext} (i.e., the attenuation of light over a distance due to particle scattering and/or gaseous absorption). The visual range and extinction coefficient are related to one another by the following equation[a]:

$$b_{ext} = 3.912 / V_r \quad (km^{-1}) \qquad (1)$$

The National Park Service (NPS) in coordination with the U.S. Fish and Wildlife Service (USFWS) uses the Deciview index[a], d_v, to describe an area's change in extinction coefficient. The deciview is defined as:

$$d_v = 10 \ln (b_{ext}/0.01) \qquad (2)$$

where ln represents the natural logarithm of the quantity in parentheses. A change in an area's deciview[b], Δd_v, of 1 corresponds to an approximate 10 percent changed in extinction, which is considered as a noticeable change in regional haze. The deciview change is defined by:

$$\Delta d_v = 10 \ln (1 + b_{exts}/b_{extb}) \qquad (3)$$

where b_{exts} and b_{extb} represent the extinction coefficients due to the source (i.e., the proposed expansion) and for the CNWR background visual range, respectively. Based on recent communications with the NPS, the background visual range for the CNWR is 65 km based on air monitoring data[c].

Calculation of Source Extinction

The source extinction due to the proposed plant expansion is calculated according to interim recommendations that are provided in the Interagency Workgroup on Air Quality Modeling (IWAQM) Phase I Report, Appendix B. The report states that the primary sources of regional visibility degradation are mostly fine particles with diameters ≤ 2.5 μm, ammonium bi-sulfate $[(NH_4)_2SO_4]$ and ammonium nitrate (NH_4NO_3). The procedures for determining the ambient concentration levels of these compounds due to the proposed project are:

1. Obtain the maximum hourly sulfur dioxide (SO_2), nitrogen oxides (NO_x), and sulfuric acid (H_2SO_4) mist impacts due to the proposed expansion from air quality dispersion models such as the Industrial Source Complex Short Term (ISCST2) or the MESOPUFF II model. For the present analysis, the maximum impacts were provided from the ISCST2 model, a steady state model that was used for the modeling analysis for the Prevention of Significant Deterioration (PSD) application. Based on verbal communications with Bud Rolofson of the NPS, the NPS had changed it's policy of using the hourly maximum impacts to using the highest 24-hour impacts for these pollutants. The maximum 24-hour

impacts are based on the highest predicted concentrations from the ISCST2 model for the 5-year period, 1982 to 1986. The maximum 24-hour impacts at the CNWR due to the proposed project only are 0.3582, 0.0326, and 0.0134 $\mu g/m^3$ for SO_2, NO_x, and H_2SO_4 mist, respectively.

2. Assume a 100 percent conversion of SO_2 to SO_4^{2-} and NO_x to NO_3. Multiplicative factors for this conversion are presented in IWAQM Inset 1, as 1.5 and 1.35, respectively, which are based on the ratios of the molecular weights of the compounds. Based on further discussions with the NPS, a 3 percent per hour conversion rate for SO_2 to SO_4^{2-} was used instead of assuming a 100 percent conversion for SO_2 to SO_4^{2-}. Table E-1 shows the hourly conversion of SO_2 to SO_4^{2-} for a maximum 24-hour SO_2 concentration of 0.3582 $\mu g/m^3$. For the worst-case 24-hour period, a 24-hour cumulative SO_4^{2-} concentration was calculated to be 0.1858 $\mu g/m^3$. Concentrations of H_2SO_4 mist were assumed to exist as primary fine particulates.

3. Calculate maximum concentrations of ammonium sulfate and ammonium nitrate from multiplicative factors 1.375 and 1.29, respectively, from IWAQM, Appendix B.

4. Obtain hourly values of relative humidity (RH). The maximum predicted 24-hour impacts from the ISCST2 model occurred on July 29, 1982. The Tampa National Weather Services' hourly surface observations for this day indicate an average RH of approximately 90 percent.

5. Calculate the extinction coefficients of ammonium sulfate, ammonium nitrate, and primary fine particulate. The extinction coefficients for each compound are defined by:

$$b_{exts} = 0.003 \text{ (comp) } f(RH)$$

where (comp) represents the ambient concentration of the compound in question, and f(RH) is the relative humidity factor. From Figure B-1 in Appendix B, a RH of 90 percent corresponds to a RH factor of 6.0. For H_2SO_4 mist (as fine particulate matter), an RH factor of unity was used per IWAQM recommendations. The total source extinction coefficient value is equal to the sum of the calculated extinction coefficients for each compound.

A summary of the calculations are provided in Table E-2. The total source extinction coefficient due to the proposed project was determined to be 0.0057. From equation (3), above, the total deciview change due to the proposed project is 0.899.

Based on this analysis, the proposed project will result in less that a 10 percent decrease in visibility to the clearest days observed at the CNWR. Therefore, no adverse impacts upon regional haze is predicted due to the proposed Cargill project.

References:

a. National Park Service, Memorandum from J. Vimont to IWAQM, December 12, 1992 (see appendix 1).
b. National Park Service, Regional haze analysis calculation worksheet, facsimile from B. Rolofson, NPS to S. Marks, KBN, July 10, 1995 (see appendix 2).
c. U.S. Fish and Wildlife Service, Air Quality Branch, Technical Review of Cargill Fertilizer. PSD Application June 26, 1995.

Table E–1. Hourly Conversion Rate of SO2 to SO4 for Proposed Cargill Expansion at the Chassahowitzka NWR

Hour	SO_2 Remaining (µg/m3)	SO_4 Produced (µg/m3)
1	0.3582	0.0107
2	0.3475	0.0104
3	0.3370	0.0101
4	0.3269	0.0098
5	0.3171	0.0095
6	0.3076	0.0092
7	0.2984	0.0090
8	0.2894	0.0087
9	0.2807	0.0084
10	0.2723	0.0082
11	0.2641	0.0079
12	0.2562	0.0077
13	0.2485	0.0075
14	0.2411	0.0072
15	0.2338	0.0070
16	0.2268	0.0068
17	0.2200	0.0066
18	0.2134	0.0064
19	0.2070	0.0062
20	0.2008	0.0060
21	0.1948	0.0058
22	0.1889	0.0057
23	0.1833	0.0055
24	0.1778	0.0053
Total		0.1858

Note: Assumes hourly conversion rate of 3 percent.

Table E–2. Calculation of Change in Deciview Due to the Proposed Cargill Project

Pollutant	Value	Reference
Maximum Emission Rates (lb/hr)		
SO_2	160.00	
NO_x	14.54	
H_2SO_4 (as PM)	6.00	
Highest 24–Hour Chassahowitzka NWR Impacts ($\mu g/m^3$)		
SO_2	0.3582	(a)
NO_x	0.0326	(b)
H_2SO_4 (as PM)	0.0134	(b)
SO_4	0.1858	(c)
NO_3	0.0439	(d)
$(NH_4)_2SO_4$	0.2555	(e)
NH_4NO_3	0.0567	(f)
Average RH (percent)	90	(g)
RH factor, f (RH)	6.0	(h)
Extinction Coefficients (km^{-1})		
Background: (b_{extb})	0.0602	(i)
$(NH_4)_2SO_4$	0.0046	(j)
NH_4NO_3	0.0010	(j)
H_2SO_4 (as PM)	0.0000	(k)
Total (bexts)	0.0057	
Deciview Change		
total delta dv =	0.8987	(l)

References:

a. Highest predicted concentration from ISCST2 model using a 5–year meteorological data record from 1982–86
b. Concentration calculated from ratio of emissions to SO_2 emissions times the maximum SO2 concentration
c. SO_4 concentrations based on 3 percent per hour conversion rate from SO2
d. $NO_3 = NO_x$ * 1.35 from IWAQM Inset No. 1
e. = SO_4 times 1.375 from IWAQM Appendix B
f. = NO_3 times 1.29 from IWAQM Appendix B
g. Based on average RH for highest impact day.
h. From IWAQM Figure B–1.
i. = 3.912 / 65 where 65 is background visual range.
j. = .003 * compound * f(RH) from IWAQM Appendix B
k. = .003 * compound. f(RH) set = 1 for fine PM
l. Delta DV = 10 * ln (1 + bexts/bextb)

APPENDIX 1

Regional Haze Analyses

Use Alumar highest individual 24-hour concentration value in CAFO

Use 62 km for background visual range

b_{ext_b} = background extinction = $\frac{3.912}{62\ km} = 0.063097$

Convert SO_2 value to $SO_4^=$	SO_2	$SO_4^=$	Hours
assume 3%/hour conversion rate	1.58	0.0474	1
	1.5326	0.0459	2
	1.4866	0.0445	3
	⋮	⋮	⋮
	0.7841	0.0235	24
	Total	$SO_4^=$	= 0.818

Calculate Source extinction = b_{ext_s}

IWAQM page B-2 $SO_4^=$ x 1.375 = $(NH_4)_2(SO_4^=)$

Use Relative Humidity 95% (assume) as R.H. from Met. Data used in modeling SO_2.

IWAQM page B-3 #3a & #3b

Determine R.H. Factor - IWAQM page B-4

$$b_{ext_s} = 0.003\left[(NH_4)_2(SO_4^=)\right]\left[R.H.\ factor\right]$$

Change in deciview = $\Delta dv = 10\ ln\left(1 + \frac{b_{ext_s}}{b_{ext_b}}\right)$

If Δdv is greater than 1 it is a noticeable change in Regional Haze i.e. approx. a 10% change in extinction

APPENDIX 2

December 15, 1992

MEMORANDUM

To: IWAQM

From: John Vimont

Subject: Estimates of noticeable regional visibility impacts

A Just Noticeable Change (JNC) will generally occur when there is approximately a 5% change in the extinction (NAPAP SOS). Extinction is related to visual range through:

$$V_r = \frac{3.912}{b_{ext}}$$

Where V_r is the visual range and b_{ext} is the extinction coefficient. Thus, if the background visual range or extinction coefficient is known, then the concentration of ammonium sulfate $[(NH_4)_2SO_4]$ which will lead to a JNC in extinction can be calculated through:

$$b_{ext} = 0.003[(NH_4)_2SO_4]f(RH)$$

Where $f(RH)$ is the relative humidity adjustment factor.

If, as in the screening procedure we have described, we assume that all of the SO_2 is converted to $SO_4^=$, which in turn reacts with NH_3 to form $(NH_4)_2SO_4$ we can plot the SO_2 concentration which will produce a JNC in extinction. This is shown in Figure 1. The $f(RH)$ used in Figure 1 to relate the visual range to the concentration was 2, corresponding to a relative humidity of approximately 68%. This corresponds to an almost dry aerosol with 100% conversion of SO_2 to $SO_4^=$. The chart would look the same if we assumed that only 33% of the SO_2 was converted and that the relative humidity was 90% ($f(RH)=6$).

It should be noted that in our report, it is indicated that we assume that all of the SO_2 is converted and that a relative humidity of 95% should be assumed. This would reduce the JNC concentrations, plotted in Figure 1 by a factor of 5.75.

I talked with Marc Pitchford, and he suggested an alternate measure to the 5% extinction value. This is the "deciview" (d_v).

$$d_v \equiv 10 \ln\left(\frac{b_{ext}}{0.01}\right)$$

where b_{ext} is expressed in km^{-1}

A change in the neighborhood of one to two d_v will yield a noticeable change in a scene. A Δd_v of 1 will correspond to approximately a 10% change in extinction. A plot of SO_2 concentration, which will produce a Δd_v of 1, versus V_z is shown in Figure 2. This is assuming full conversion of SO_2 to $(NH_4)_2SO_4$ and a relative humidity of 68%.

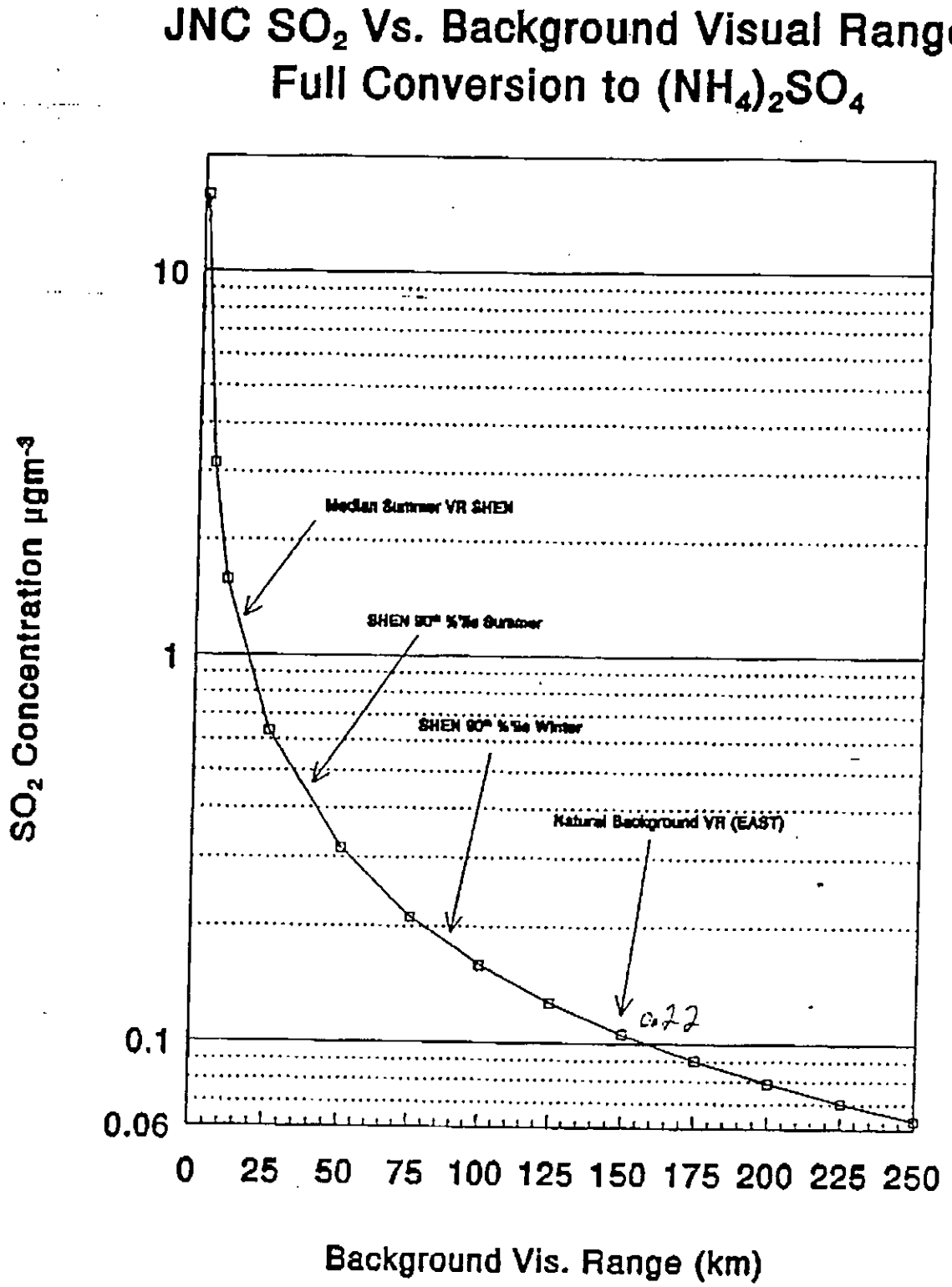

Figure 1 - SO_2 concentrations (as a surrogate for $(NH_4)_2SO_4$) which will produce a Just Noticeable Change in extinction for different background visual ranges. RH of 68%.

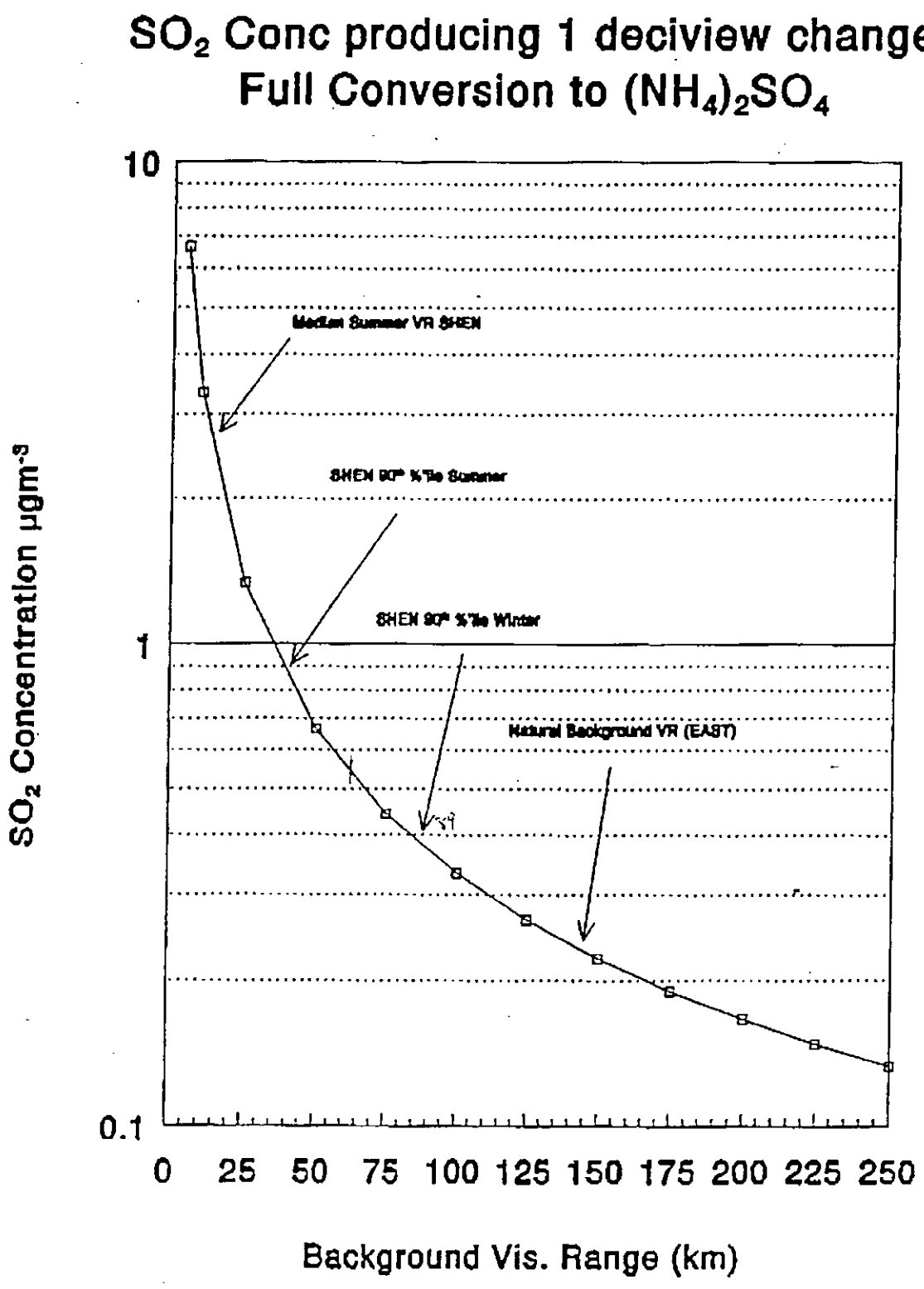

Figure 2 - SO_2 concentrations (as a surrogate for $(NH_4)_2SO_4$) which will produce a Δd_v of 1 for different background visual ranges. RH of 68%.

KBN
A GOLDER ASSOCIATES COMPANY

July 18, 1996

RECEIVED
JUL 19 1996
BUREAU OF
AIR REGULATION

Mr. Cleveland Holladay
Bureau of Air Quality Management
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, FL 32399-2400

RE: Cargill Riverview AFI Plant Expansion
PSD - ISCST3 Modeling Files

Dear Cleve:

Please find enclosed one hard copy and 1 disk copy (on 2 disks) for the above referenced PSD Application. Disk output and summary files are compressed using the utility PKZIP. A sheet describing the contents of each ZIP file is attached and is also included as a READ.ME file on each disk. Should you have any questions about the modeling files, please call me at (904) 336-5600. Thank you.

Sincerely,

Steven R. Marks/RJP

Steven R. Marks
Senior Meteorologist

SRM/arz

cc: David Buff, KBN
File (2)

ASCII

9651074Y/F1/WP/6

6241 Northwest 23rd Street
Suite 500
Gainesville, Florida 32653-1500
352-336-5600 FAX 352-336-2603

5405 West Cypress Street
Suite 215
Tampa, Florida 33607
813-287-1717 FAX 813-287-1716

1601 Clint Moore Road
Suite 105
Boca Raton, Florida 33487
407-994-9910 FAX 407-994-9393

7785 Baymeadows Way
Suite 105
Jacksonville, Florida 32256
904-739-3600 FAX 904-739-7777

1616 'P' Street NW
Suite 350
Washington, DC 20036
202-462-1100 FAX 202-462-2270

United States Department of the Interior

FISH AND WILDLIFE SERVICE
1875 Century Boulevard
Atlanta, Georgia 30345

IN REPLY REFER TO

JUL 03 1995

Mr. Clair H. Fancy
Chief, Bureau of Air Regulation
Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road, MS 48
Tallahassee, Florida 32399

Dear Mr. Fancy:

We have reviewed the Prevention of Significant Deterioration Application for the proposed increase in production at the Cargill Fertilizer, Inc., Nos. 4, 5, and 6 sulfuric acid (H_2SO_4) production plants in Bartow, Florida. Enclosed are the technical review comments from our Air Quality Branch.

Thank you for giving us the opportunity to comment on this permit application. We appreciate your cooperation in notifying us of proposed projects with the potential to impact the air quality and related resources of our Class I air quality areas. If you have questions, please contact Ms. Ellen Porter of our Air Quality Branch in Denver at telephone number 303/969-2617.

Sincerely yours,

Noreen K. Clough

Noreen K. Clough
Regional Director

Enclosure

Technical Review of Prevention of Significant Deterioration
Permit Application for Cargill Fertilizer, Inc.'s
Proposed Production Rate Increase for
Sulfuric Acid Plants Nos. 4, 5, and 6,
Polk County, Florida
by
Air Quality Branch, Fish and Wildlife Service - Denver

Cargill Fertilizer, Inc., is proposing to increase production at its Nos. 4, 5, and 6 sulfuric acid (H_2SO_4) plants in Bartow, Florida. The Cargill facility is located 105 km south of Chassahowitzka Wilderness Area (WA), a Class I air quality area administered by the U.S. Fish and Wildlife Service. The proposed modification will result in significant increases in emissions of sulfur dioxide (SO_2), H_2SO_4 mist, and nitrogen oxides (NO_x).

Air Quality Modeling Analysis

The applicant used the EPA ISCST2 model to assess the impacts to Chassahowitzka WA from emissions of SO_2 and NO_x. The modeling was performed for five years (1982-1986). We request clarification of the source emission inventory applied in this analysis. Specifically, please clarify whether the North Carolina "20-D" methodology was used or if the analysis included the SO_2 sources found in previous Chassahowitzka WA Class I increment analyses.

The analysis predicted that emissions from the proposed project would not contribute significantly to Class I nitrogen dioxide increment consumption; emissions would significantly contribute to Class I SO_2 increment consumption at Chassahowitzka WA for all averaging periods. Therefore, a cumulative SO_2 increment analysis was performed. This analysis predicted 33 exceedances of the 24-hour Class I SO_2 increment. However, SO_2 emissions from the proposed project would not significantly contribute to the exceedances.

As we have noted in previous comments to you (e.g., Piney Point Phosphates, 5/30/95; Farmland Hydro, 3/29/95; Seminole Electric Hardee Unit 3, 6/22/94; IMC-Agrico, 2/24/94), we are concerned about predicted violations of the short-term Class I SO_2 increments at Chassahowitzka WA. We agree with you that a more refined modeling analysis is needed to assess the status of increment consumption at the wilderness area and determine, if necessary, the causes of increment violations.

The applicant did not model the impacts of H_2SO_4 emissions to Chassahowitzka WA. By ratioing H_2SO_4 emissions to SO_2 emissions, our office calculated that the maximum 24-hour H_2SO_4 impact to Chassahowitzka WA would be 0.022 micrograms per cubic meter. Please require future applicants to address impacts of H_2SO_4 emissions to Class I areas.

Best Available Control Technology (BACT)

The BACT analysis is complete.

Air Quality Related Values (AQRV) Analysis

The AQRV analysis for biological resources is complete. However, the AQRV analysis for visibility is not complete.

The coherent plume impact analysis using the EPA VISCREEN model was not performed correctly. The measured background visual range for Chassahowitzka WA is 65 km, not the 25 km used by the

applicant. Additionally, H_2SO_4 emissions should be included as primary sulfate in the VISCREEN analysis. Please have the applicant perform the VISCREEN analysis using a background visual range of 65 km and including H_2SO_4 emissions.

The applicant did not perform a regional haze analysis. The methodology for regional haze calculations is found in Appendix B of the EPA document Interagency Workgroup on Air Quality Modeling (IWAQM) Phase 1 Report: Interim Recommendation for Modeling Long Range Transport and Impacts on Regional Visibility (EPA-454/R-93-015, April 1993). The applicant should contact our office for updates on these procedures. The measured background visual range of 65 km should be used. In addition, the analysis should use the 24-hour concentrations of SO_2 and H_2SO_4 stack emissions at Chassahowitzka WA.

If you have any questions, please call Ellen Porter of our office at (303) 969-2617.

faxed to you on 7-5-95

United States Department of the Interior

FISH AND WILDLIFE SERVICE
1875 Century Boulevard
Atlanta, Georgia 30345

JUL 0 3 1995

IN REPLY REFER TO:

RECEIVED
JUL 13 1995
Bureau of
Air Regulation

Mr. Clair H. Fancy
Chief, Bureau of Air Regulation
Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road, MS 48
Tallahassee, Florida 32399

Dear Mr. Fancy:

We have reviewed the Prevention of Significant Deterioration Application for the proposed increase in production at the Cargill Fertilizer, Inc., Nos. 4, 5, and 6 sulfuric acid (H_2SO_4) production plants in Bartow, Florida. Enclosed are the technical review comments from our Air Quality Branch.

Thank you for giving us the opportunity to comment on this permit application. We appreciate your cooperation in notifying us of proposed projects with the potential to impact the air quality and related resources of our Class I air quality areas. If you have questions, please contact Ms. Ellen Porter of our Air Quality Branch in Denver at telephone number 303/969-2617.

Sincerely yours,

Noreen K. Clough

Noreen K. Clough
Regional Director

Enclosure

cc: S. Arif
C. Halladay
B. Thomas, Sw Dist.
J. Novak, Polk Co.
Q. Harper, EPA
D. Buff, KBN

Technical Review of Prevention of Significant Deterioration
Permit Application for Cargill Fertilizer, Inc.'s
Proposed Production Rate Increase for
Sulfuric Acid Plants Nos. 4, 5, and 6,
Polk County, Florida
by
Air Quality Branch, Fish and Wildlife Service - Denver

Cargill Fertilizer, Inc., is proposing to increase production at its Nos. 4, 5, and 6 sulfuric acid (H_2SO_4) plants in Bartow, Florida. The Cargill facility is located 105 km south of Chassahowitzka Wilderness Area (WA), a Class I air quality area administered by the U.S. Fish and Wildlife Service. The proposed modification will result in significant increases in emissions of sulfur dioxide (SO_2), H_2SO_4 mist, and nitrogen oxides (NO_x).

Air Quality Modeling Analysis

The applicant used the EPA ISCST2 model to assess the impacts to Chassahowitzka WA from emissions of SO_2 and NO_x. The modeling was performed for five years (1982-1986). We request clarification of the source emission inventory applied in this analysis. Specifically, please clarify whether the North Carolina "20-D" methodology was used or if the analysis included the SO_2 sources found in previous Chassahowitzka WA Class I increment analyses.

The analysis predicted that emissions from the proposed project would not contribute significantly to Class I nitrogen dioxide increment consumption; emissions would significantly contribute to Class I SO_2 increment consumption at Chassahowitzka WA for all averaging periods. Therefore, a cumulative SO_2 increment analysis was performed. This analysis predicted 33 exceedances of the 24-hour Class I SO_2 increment. However, SO emissions from the proposed project would not significantly contribute to the exceedances.

As we have noted in previous comments to you (e.g., Piney Point Phosphates, 5/30/95; Farmland Hydro, 3/29/95; Seminole Electric Hardee Unit 3, 6/22/94; IMC-Agrico, 2/24/94), we are concerned about predicted violations of the short-term Class I SO_2 increments at Chassahowitzka WA. We agree with you that a more refined modeling analysis is needed to assess the status of increment consumption at the wilderness area and determine, if necessary, the causes of increment violations.

The applicant did not model the impacts of H_2SO_4 emissions to Chassahowitzka WA. By ratioing H_2SO_4 emissions to SO_2 emissions, our office calculated that the maximum 24-hour H SQ impact to Chassahowitzka WA would be 0.022 micrograms per cubic meter. Please require future applicants to address impacts of H_2SO_4 emissions to Class I areas.

Best Available Control Technology (BACT)

The BACT analysis is complete.

Air Quality Related Values (AQRV) Analysis

The AQRV analysis for biological resources is complete. However, the AQRV analysis for visibility is not complete.

The coherent plume impact analysis using the EPA VISCREEN model was not performed correctly. The measured background visual range for Chassahowitzka WA is 65 km, not the 25 km used by the

applicant. Additionally, H_2SO_4 emissions should be included as primary sulfate in the VISCREEN analysis. Please have the applicant perform the VISCREEN analysis using a background visual range of 65 km and including H_2SO_4 emissions.

The applicant did not perform a regional haze analysis. The methodology for regional haze calculations is found in Appendix B of the EPA document Interagency Workgroup on Air Quality Modeling (IWAQM) Phase 1 Report: Interim Recommendation for Modeling Long Range Transport and Impacts on Regional Visibility (EPA-454/R-93-015, April 1993). The applicant should contact our office for updates on these procedures. The measured background visual range of 65 km should be used. In addition, the analysis should use the 24-hour concentrations of SO_2 and H_2SO_4 stack emissions at Chassahowitzka WA.

If you have any questions, please call Ellen Porter of our office at (303) 969-2617.

Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

June 29, 1995

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. David A. Buff, P.E.
KBN Engineering and Applied Sciences, Inc.
6241 Northwest 23rd Street, Suite 500
Gainesville, Florida 32653-1500

Re: Cargill Fertilizer, Inc.
Expansion of Sulfuric Acid Plants No. 4, 5, and 6
Permit File No. AC 53-271436, PSD-FL-229

Dear Mr. Buff:

The Department received the application for production increases for sulfuric acid plants Nos. 4, 5, and 6 (2,280 to 2,600 tons per day), and associated throughput rate increases for the molten sulfur storage at Cargill's existing facility in Bartow, Polk County, Florida. The modeling data was received on June 2, 1995. Following are additional modeling questions:

1. In table 2-1, why are the new proposed limits based on a 3-hour average?

2. What are the dimensions of the new 7500 ton storage tank? Please evaluate the ambient impacts from molten sulfur handling system.

3. For the Class I Area impact analyses, see the attached letter from the National Park Service. Please respond to their comments.

Please submit the information requested above to the Department's Bureau of Air Regulation.

We will resume processing this application after we receive the requested information. If you have any questions regarding this matter, please call Cleve Holladay or Katherine Zhang at 904-488-1344.

Sincerely,

A. A. Linero 6/29

A. A. Linero, P.E.
Administrator
New Source Review Section

AAL/kz/t

cc: B. Thomas, SWD
D. Jellerson, Cargill
J. Harper, EPA
J. Bunyak, NPS

DRAFT

Technical Review of Prevention of Significant Deterioration Permit Application for Cargill Fertilizer, Inc.'s Proposed Production Rate Increase for Sulfuric Acid Plants Nos. 4, 5, and 6, Polk County, Florida

by

Air Quality Branch, Fish and Wildlife Service - Denver

Cargill Fertilizer, Inc., is proposing to increase production at its Nos. 4, 5, and 6 sulfuric acid (H_2SO_4) plants in Bartow, Florida. The Cargill facility is located 105 km south of Chassahowitzka Wilderness Area (WA), a Class I air quality area administered by the U.S. Fish and Wildlife Service. The proposed modification will result in significant increases in emissions of sulfur dioxide (SO_2), H_2SO_4 mist, and nitrogen oxides (NO_x).

Air Quality Modeling Analysis

The applicant used the EPA ISCST2 model to assess the impacts to Chassahowitzka WA from emissions of SO_2 and NO_x. The modeling was performed for five years (1982-1986). We request clarification of the source emission inventory applied in this analysis. Specifically, please clarify whether the North Carolina "20-D" methodology was used or if the analysis included the SO_2 sources found in previous Chassahowitzka WA Class I increment analyses.

The analysis predicted that emissions from the proposed project would not contribute significantly to Class I nitrogen dioxide increment consumption; emissions would significantly contribute to Class I SO_2 increment consumption at Chassahowitzka WA for all averaging periods. Therefore, a cumulative SO_2 increment analysis was performed. This analysis predicted 33 exceedances of the 24-hour Class I SO_2 increment. However, SO_2 emissions from the proposed project would not significantly contribute to the exceedances.

As we have noted in previous comments to you (e.g., Piney Point Phosphates, 5/30/95; Farmland Hydro, 3/29/95; Seminole Electric Hardee Unit 3, 6/22/94; IMC-Agrico, 2/24/94), we are concerned about predicted violations of the short-term Class I SO_2 increments at Chassahowitzka WA. We agree with you that a more refined modeling analysis is needed to assess the status of increment consumption at the wilderness area and determine, if necessary, the causes of increment violations.

The applicant did not model the impacts of H_2SO_4 emissions to Chassahowitzka WA. By ratioing H_2SO_4 emissions to SO_2 emissions, our office calculated that the maximum 24-hour H_2SO_4 impact to Chassahowitzka WA would be 0.022 micrograms per cubic meter. Please require future applicants to address impacts of H_2SO_4 emissions to Class I areas.

Best Available Control Technology (BACT)

The BACT analysis is complete.

Air Quality Related Values (AQRV) Analysis

The AQRV analysis for biological resources is complete. However, the AQRV analysis for visibility is not complete.

The coherent plume impact analysis using the EPA VISCREEN model was not performed correctly. The measured background visual range for Chassahowitzka WA is 65 km, not the 25 km used by the applicant. Additionally, H_2SO_4 emissions should be included as primary sulfate in the VISCREEN analysis. Please have the applicant perform the VISCREEN analysis using a background visual range of 65 km and including H_2SO_4 emissions.

The applicant did not perform a regional haze analysis. The methodology for regional haze calculations is found in Appendix B of the EPA document Interagency Workgroup on Air Quality Modeling (IWAQM) Phase 1 Report: Interim Recommendation for Modeling Long Range Transport and Impacts on Regional Visibility (EPA-454/R-93-015, April 1993). The applicant should contact our office for updates on these procedures. The measured background visual range of 65 km should be used. In addition, the analysis should use the 24-hour concentrations of SO_2 and H_2SO_4 stack emissions at Chassahowitzka WA.

If you have any questions, please call Ellen Porter of our office at (303) 969-2617.

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:
David A. Buff, PE
KBN Engineering + Applied Sc
6241 NW 23rd St, Suite 500
Gainesville, Fl
32653-1500

4a. Article Number
Z 392 979 011

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

7. Date of Delivery
7-3

5. Signature (Addressee)
J M Sims

6. Signature (Agent)

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

PS Form 3811, December 1991 *U.S. GPO: 1993—352-714 DOMESTIC RETURN RECEIPT

Thank you for using Return Receipt Service.

Z 392 979 011

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

UNITED STATES POSTAL SERVICE

PS Form 3800, March 1993

Sent to: David Buff	
Street and No. KBN	
P.O., State and ZIP Code (Carsell Ert.)	
Postage Gainesville, Fl	$
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 6-29-95	

HC53-271436
PSD-FI-229

Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

June 19, 1995

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. David A. Buff, P.E.
KBN Engineering and Applied Sciences, Inc.
6241 Northwest 23rd Street, Suite 500
Gainesville, Florida 32653-1500

Re: Cargill Fertilizer, Inc.
Nos. 4, 5, and 6 Sulfuric Acid Plants Expansion
Permit File No. AC 53-271436, PSD-FL-229

Dear Mr. Buff:

The Department has received the application for an increase in the Nos. 4, 5, and 6 sulfuric acid plants production rates (2,280 to 2,600 tons per day), and associated throughput rate increases for the molten sulfur storage at your existing facility in Bartow, Polk County, Florida. Based on our initial review of the proposed project, we have determined that additional information is needed in order to continue processing this application package. Please submit the information requested below to the Department's Bureau of Air Regulation.

1. Table 2-3 of the application indicates that the total emissions from 7,500 ton storage tank will be less than emissions from the 3,000 ton storage tank for molten sulfur handling. Please explain the discrepancy.

2. PSD-FL-209 was issued to Cargill Fertilizer for Nos. 8 and 9 sulfuric acid plants production increases in March 1995. Excess sulfuric acid was explained to be for Cargill's Bartow facility. If Nos. 4, 5, and 6 rate increases are for the Bartow facility, please elaborate as to what the outcome will be for the Nos. 8 and 9 sulfuric acid plants rate increases.

3. Please provide the names, addresses and telephone numbers for the persons contacted at Monsanto Enviro-Chem for budgetary quotations and engineering estimates in developing capital and annualized cost estimates for this project.

4. Appendix B of the application contains statistical analysis of the continuous SO_2 emission from the Nos. 4, 5, and 6 sulfuric acid plants. Please redo the analyses, as the Department cannot confirm the numbers obtained by the applicant. Also, based on the analyses, the 95% confidence interval for all three plants violates the new source performance standard (NSPS) of 4 lbs/ton. What assurances can the applicant provide to the Department that with increased production rates the NSPS can be complied with most of the time.

5. Modeling data was received on June 2, 1995. Therefore, after it is reviewed the Department may have additional questions.

We will resume processing this application after we receive the requested information. If you have any questions regarding this matter, please call Syed Arif at 904-488-1344.

Sincerely,

A. A. Linero, P.E.
Administrator
New Source Review Section

AAL/sa/t

cc: B. Thomas, SWD
D. Jellerson, Cargill
J. Harper, EPA
J. Bunyak, NPS

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:
David A. Buff, P.E.
KBN Engineering A.S.
6241 NW 23rd St, 500
Gainesville, Fl
32653-1500

4a. Article Number
Z 392 979 046

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

7. Date of Delivery
6-22-95

5. Signature (Addressee)

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

6. Signature (Agent)
M. Reinert

PS Form 3811, December 1991 *U.S. GPO: 1993—352-714 **DOMESTIC RETURN RECEIPT**

Thank you for using Return Receipt Service.

Z 392 979 046

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

UNITED STATES POSTAL SERVICE

PS Form 3800, March 1993

Sent to
David Buff
Street and No.
KBN Eng. & A.S.
P.O., State and ZIP Code
Gainesville, 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 6-19-95

AC 53-271436
PSD-Fl-229

Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

May 25, 1995

Ms. Jewell A. Harper, Chief
Air Enforcement Branch
U.S. EPA, Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30308

RE: Cargill Fertilizer, Inc.
Sulfuric Acid Plant Production Increase
Polk County, PSD-FL-229

Dear Ms. Harper:

Enclosed for your review and comment is the above referenced PSD application. Please forward your comments to the Department's Bureau of Air Regulation as soon as possible. The Bureau's FAX number is (904)922-6979.

If you have any questions, please contact Al Linero or Cleve Holladay at (904)488-1344 or write to me at the above address.

Sincerely,

Patty Adams for

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

CHF/pa

Enclosures

Department of
Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

May 25, 1995

Ms. Linda Novak
Polk County Air Quality Program
P. O. Box 39
Bartow, FL 33830

RE: Cargill Fertilizer, Inc.
Sulfuric Acid Plant Production Increase
Polk County, PSD-FL-229

Dear Ms. Novak:

Enclosed for your review and comment is the above referenced PSD application. Please forward your comments to the Department's Bureau of Air Regulation as soon as possible. The Bureau's FAX number is (904)922-6979.

If you have any questions, please contact Al Linero or Cleve Holladay at (904)488-1344 or write to me at the above address.

Sincerely,

Patty Adams

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

CHF/pa

Enclosures

Department of
Environmental Protection

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Lawton Chiles
Governor

Virginia B. Wetherell
Secretary

May 25, 1995

Mr. John Bunyak, Chief
Policy, Planning and Permit Review Branch
National Park Service-Air Quality Division
P. O. Box 25287
Denver, Colorado 80225

RE: Cargill Fertilizer, Inc.
Sulfuric Acid Plant Production Increase
Polk County, PSD-FL-229

Dear Mr. Bunyak:

Enclosed for your review and comment is the above referenced PSD application. Please forward your comments to the Department's Bureau of Air Regulation as soon as possible. The Bureau's FAX number is (904)922-6979.

If you have any questions, please contact Al Linero or Cleve Holladay at (904)488-1344 or write to me at the above address.

Sincerely,

Patty Adams for

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

CHF/pa

Enclosures