IMC FERTILIZER, INC.

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CERTIFIED MAIL
RETURN RECEIPT REQUESTED

December 4, 1992

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

RE: PSD Construction Permit
Air Classifier at AFI Plant

Dear Mr. Fancy:

Enclosed please find the following materials for the review of the proposed project to install a product air classifier at the AFI Plant, New Wales Operations, IMC Fertilizer, Inc. at Mulberry, Florida.

1. Five copies of the permit application
2. Five copies of the PSD Analysis
3. Five sets of five Model Runs (AWL, AWM, AWN, AWO, AWP)
4. Two disks containing Model Run input and output files for all the runs.
5. Our check number 025396 in the amount of $2,000 for the application fee.

IMC Fertilizer, Inc. • New Wales Operations
P. O. Box 1035 • Hwy. 640 West • Mulberry, Florida 33860 • (813) 428 2531

Thank you for your attention in this matter. If you have any questions, please do not hesitate to contact me.

Sincerely,

J M Baretincic

J. M. Baretincic
Director
Environmental Services

JMB:lmr
Enclosures

CC: J. A. Brafford (w/o enc.)

(#3)

The Citizens & Southern National Bank
Atlanta, Dekalb County, Georgia

IMC FERTILIZER, INC.
NEW WALES OPERATIONS
P.O. BOX 1035 • MULBERRY, FLORIDA 33860

IMC FERTILIZER, INC.

64-1278 / 611

CHECK NO. 025396

PAY EXACTLY *******2,000.00***

MONTH	DAY	YEAR
12	07	92

OPERATING ACCOUNT

AMOUNT
*******2,000.00

PAY TO THE ORDER OF

DEPARTMENT OF ENVIRONMENTAL
REGULATION
2600 BLAIR STONE ROAD
TALLAHASSEE FL 32399

J.T. Brafford
AUTHORIZED SIGNATURE

⑈025396⑈ ⑆061112788⑆ 011 38 049⑈

RECEIVED
DEC 7 1992

NO. 025396 D24336

IMC FERTILIZER, INC.
NEW WALES OPERATIONS • P.O. BOX 1035 • MULBERRY, FLORIDA 33860

IMC FERTILIZER, INC.

INVOICE DATE			INVOICE NUMBER	REFERENCE NUMBER	PURCHASE ORDER NO	INVOICE AMOUNT	DISCOUNT	NET PAYABLE
MONTH	DAY	YEAR						
12	01	92	PERMIT	622-827	Division of Air Resources Management	2000.00		2000.00
						2000.00	.00	2000.00

Original check was sent to FEA on 12-8-92

Barbara
(mail Room)

$12,000 pd. - 12-7-92
Recpt. #180823

DER Form #	
Form Title	
Effective Date	
DER Application No.	(Filled in by DER)

Florida Department of Environmental Regulation

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

AC53-222859
PSD-FL-199

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: PARTICULATE [X] New[1] [ ] Existing[1]

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

COMPANY NAME: IMC FERTILIZER, INC. 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) AFI AIR CLASSIFIER WITH BAG COLLECTOR

SOURCE LOCATION: Street HIGHWAY 640 & COUNTY LINE ROAD City MULBERRY

UTM: East (17) 396.7 KM North 3079.4 KM

Latitude ____ ° ____ ' ____ "N Longitude ____ ° ____ ' ____ "W

APPLICANT NAME AND TITLE: JOHN A. BRAFFORD, VICE PRESIDENT & GENERAL MANAGER

APPLICANT ADDRESS: POST OFFICE BOX 1035 - MULBERRY, FLORIDA 33860

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of IMC FERTILIZER, INC.

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: [signature]

JOHN A. BRAFFORD
VICE PRESIDENT & GENERAL MANAGER
Name and Title (Please Type)

Date: 12/04/92 Telephone No. (813) 428-2531

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, tha

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

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: Charles David Turley

CHARLES DAVID TURLEY
Name (Please Type)

IMC FERTILIZER, INC.
Company Name (Please Type)

POST OFFICE BOX 1035 - MULBERRY, FLORIDA 33860
Mailing Address (Please Type)

Florida Registration No. 23344 Date: 12/04/92 Telephone No. (813) 428-2531

SECTION II: GENERAL PROJECT INFORMATION

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

The project covered by this application will install an air classifier for product sizing at the IMCF - New Wales Animal Feed Ingredients Plant. Particulate emissions will be controlled by a bag collector in order to comply with applicable emission limitations.

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

Start of Construction September 1993* Completion of Construction February 1994
*Based on permit approval by 6/30/93.

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

See accompanying analysis.

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

Permit: AO53-142020 Issued: 2/12/88 Expires: 2/9/93

E. Requested permitted equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 52 ;
if power plant, hrs/yr_____; if seasonal, describe:______

______

______

______

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? ______

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

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

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

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

4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? NO

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?______

   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.

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

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

Description	Contaminants		Utilization Rate - ~~lbs/hr~~	Relate to Flow Diagram
	Type	% Wt		
AFI Product	Fines	<1%	142 TPH	Surge Hopper

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

1. Total Process Input Rate (~~lbs/hr~~): 142 TPH

2. Product Weight (~~lbs/hr~~): 125 TPH (After Classifier)

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

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/yr	T/yr	
Particulate	9.94	43.5	17-2.630	9.94*		7447	Stack

*See Table 4.1

[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).

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)
Bag Collector,	Particulate	99+	100% <10μ	Design
Fuller-Kavaco,				
Model 640510				
(or Equivalent)				

E. Fuels N/A

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 ______________ Maximum ______________

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

Collected material returned to process.

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

Stack Height: 145 ft. Stack Diameter: 4.5 ft.

Gas Flow Rate: 58000 ACFM 53000 DSCFM Gas Exit Temperature: 105 °F.

Water Vapor Content: <2% % Velocity: 60 FPS

SECTION IV: INCINERATOR INFORMATION

N/A

Type of Waste	Type 0 (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Patholog-ical)	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Inciner-ated							
Uncon-trolled (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 Type	Fuel BTU/hr	Temperature (°F)
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 ANALYSIS

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)]

2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.

3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).

4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.)

5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).

6. An 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.

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).

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.

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation. $2,000.00

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

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

SEE ATTACHED ANALYSIS

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 ATTACHED ANALYSIS

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.

PSD ANALYSIS

FOR

CONSTRUCTION PERMIT APPLICATION

FOR

INSTALLATION OF AIR CLASSIFIER

IN

ANIMAL FEED INGREDIENTS PLANT

AT

NEW WALES OPERATIONS

IMC FERTILIZER, INC.

MULBERRY, FLORIDA

DECEMBER 4, 1992

PREPARED: C. D. TURLEY

IMC FERTILIZER, INC.

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1. PROJECT DESCRIPTION

This application covers the addition of an air classification system to the process equipment of the Animal Feed Ingredients (AFI) Plant. The purpose of the project is to improve the granular AFI products by removing the -65 Mesh material from the final product.

2. FACILITY DESCRIPTION

The New Wales Plant is a phosphate fertilizer manufacturing plant, SIC Code 2874, located on County Road 640 and County Line Road in Polk County, Florida. The UTM coordinates of the facility are Zone 17, 396.55 km East and 3078.90 km North. The location is shown in the UTM Grid Location Drawing. (Figure 2.1)

2.1 FACILITY

The New Wales facility is a phosphate fertilizer manufacturing complex located south of the city of Mulberry on County Road 640. The complex is surrounded by IMCF properties except for a common boundary with a Mobil clay settling area. The facility complex consists of 5 Sulfuric Acid Plants, 3 Phosphoric Acid Plants, 3 Diammonium Phosphate (DAP) Plants, 1 Monoammonium Phosphate (MAP) Plant, 1 Multifos Plant, 1 AFI Plant, and a Uranium Recovery Plant.

2.2 ANIMAL FEED INGREDIENTS PLANT

The Animal Feed Ingredients Plant at New Wales was originally constructed in 1977 with a permitted production rate of 120 TPH of AFI product. The plant produces feed grade supplements for certain livestock feeds. These supplements are produced by neutralization of defluorinated phosphoric acid with either limestone or ammonia, depending on the type of product.

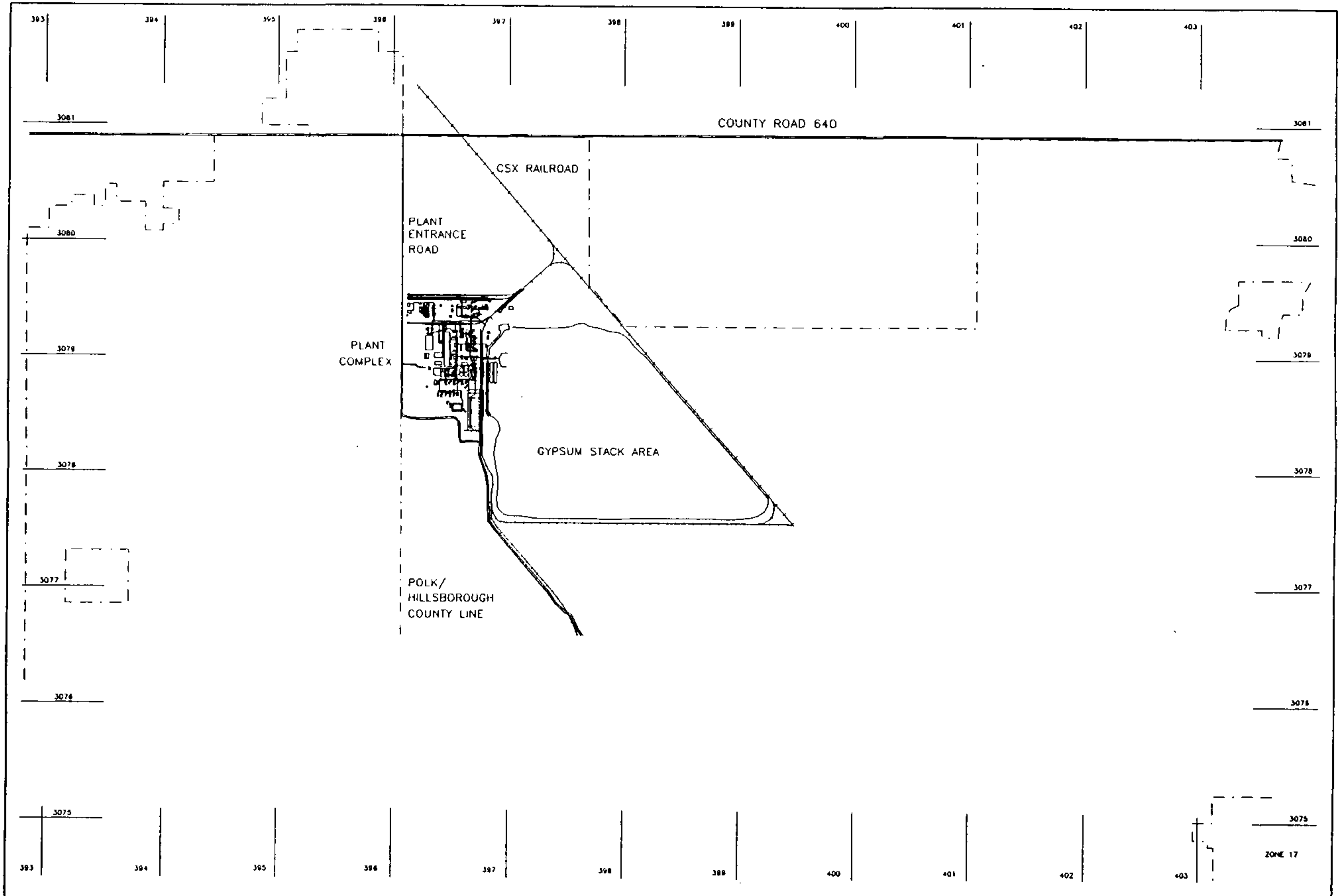


FIGURE 2.1 UTM COORDINATE DIAGRAM

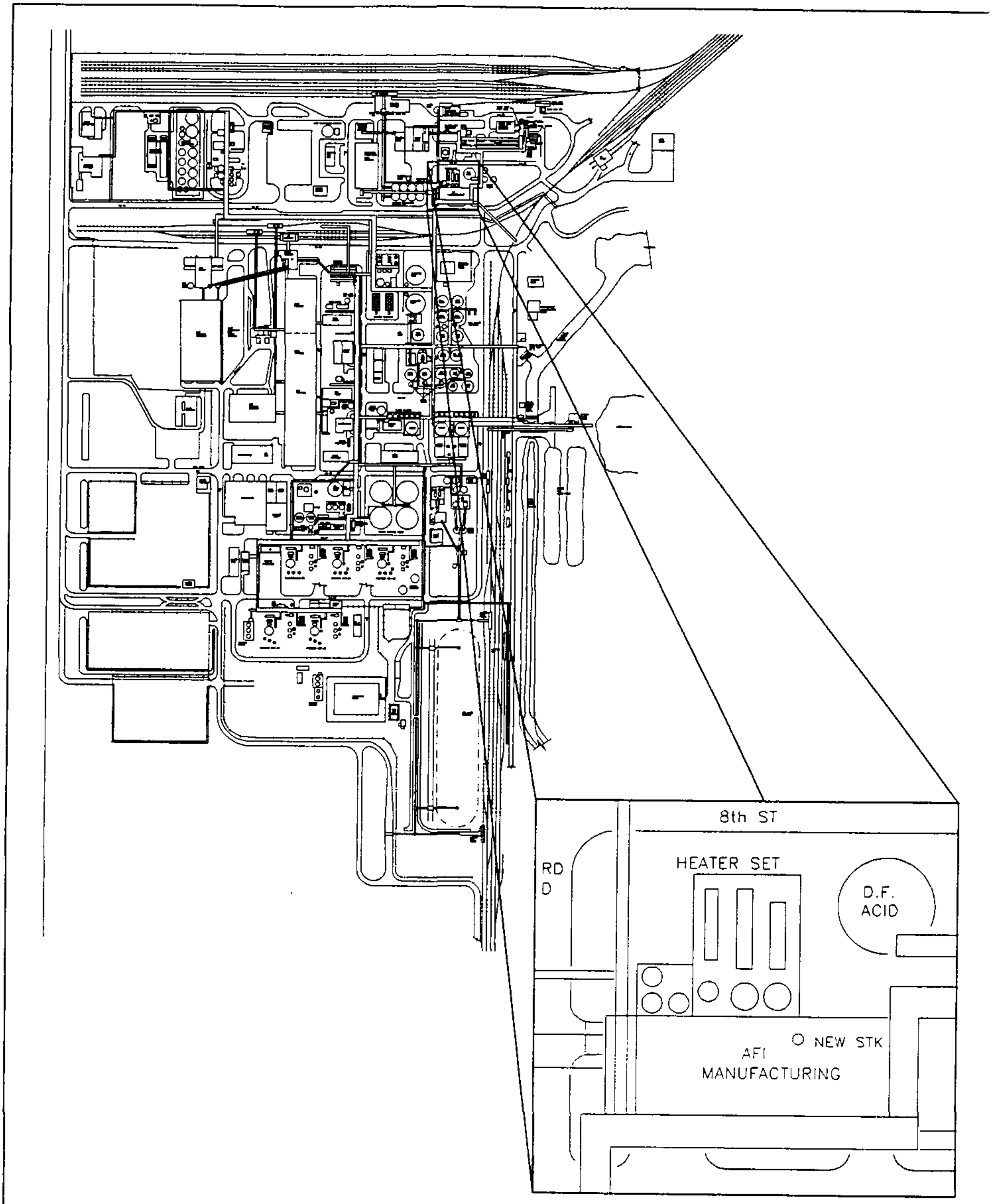


FIGURE 2.2 FACILITY LOCATION DIAGRAM

3. PROPOSED PROJECT

This permit application covers the installation of an air classifier, a product recovery cyclone, and a pulse-type bag collector for particulate emission control.

3.1 PROJECT DESCRIPTION

The installation of the air classifier will produce more closely sized material in the product than at present. The finer material will be returned to the process for regranulation. The product will be discharged to one of the three existing screens. This screen will be modified to remove oversize particles which will also be recycled to the process. The two remaining screens will be retained for use during overflow conditions or for when the classifier is out of service.

3.1.1 PROCESS DESCRIPTION

AFI products are produced by neutralization of defluorinated phosphoric acid with either limestone or ammonia, depending on the type of product. The air classifier will be placed in the existing product stream so that the final product can be more closely sized than is possible with the current system of sizing screens. The air classification will be accomplished using fluidization of the material in an air stream. This fluidizing air will then pass through a product recovery cyclone and the emission control bag collector. All collected material will be recycled to the process stream for regranulation.

3.1.2 AIR EMISSION SOURCES

The only emissions generated by the installation of this air classification system will be particulate matter. Because of the defluorinzation of the phosphoric acid used in the process, there will be no fluoride emissions.

The removal of the finer materials from the products will reduce particulate emissions in subsequent handling activities such as storage, loading, and unloading. The reduction is not quantifiable for any individual operation or activity. It, therefore, cannot be included in the consideration on contemporaneous emission changes.

3.1.3 AIR EMISSIONS

The particulate emissions from the classifier and cyclone will be controlled by a bag collector. The emissions will be less than 10 lb/hr. The emissions will enter the atmosphere through a 145 ft. stack following the fan.

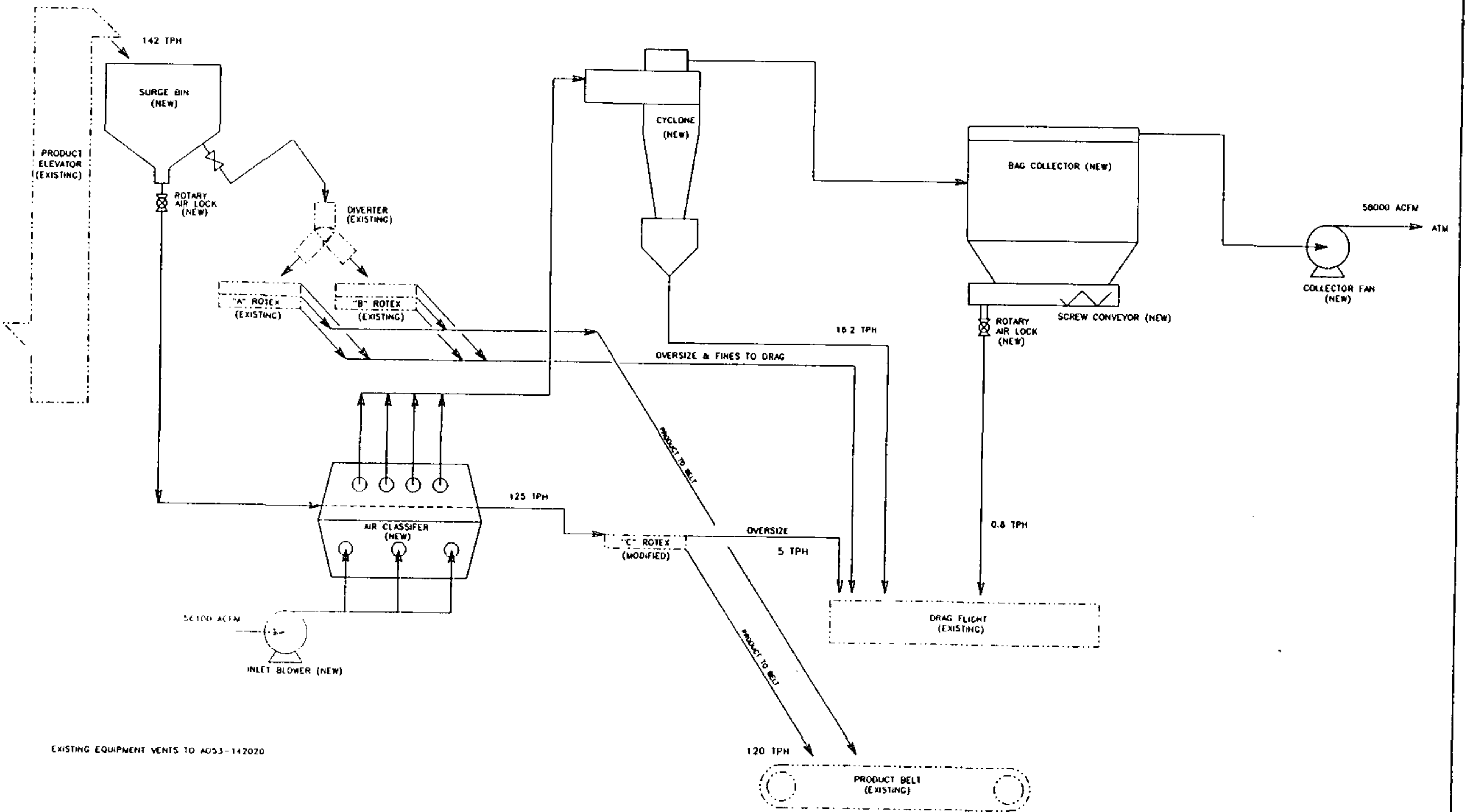


FIGURE 3.1 PROCESS FLOW DIAGRAM

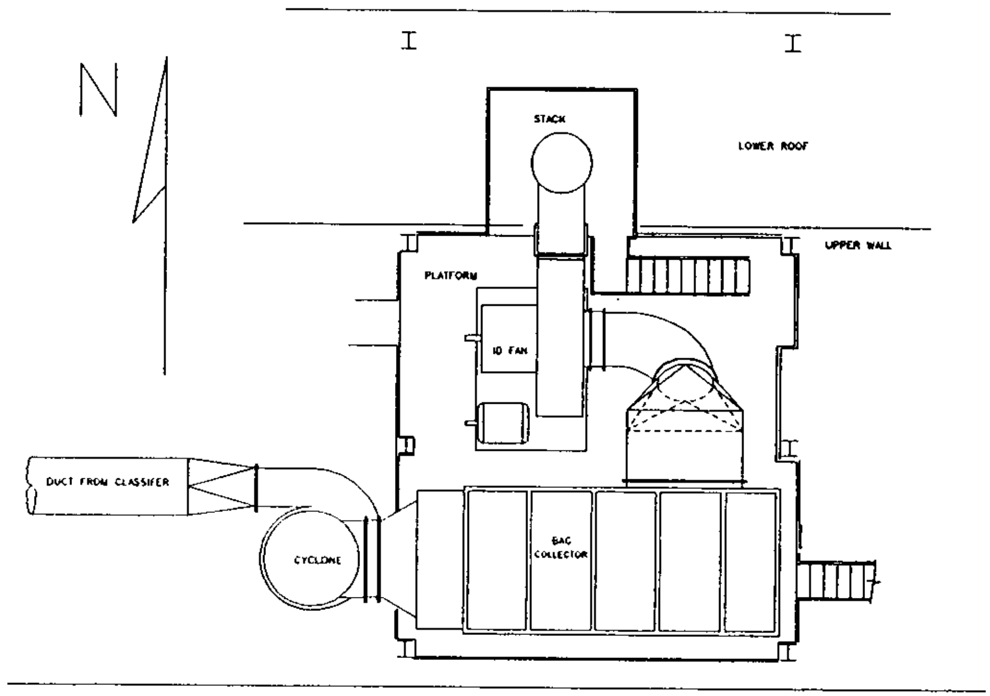
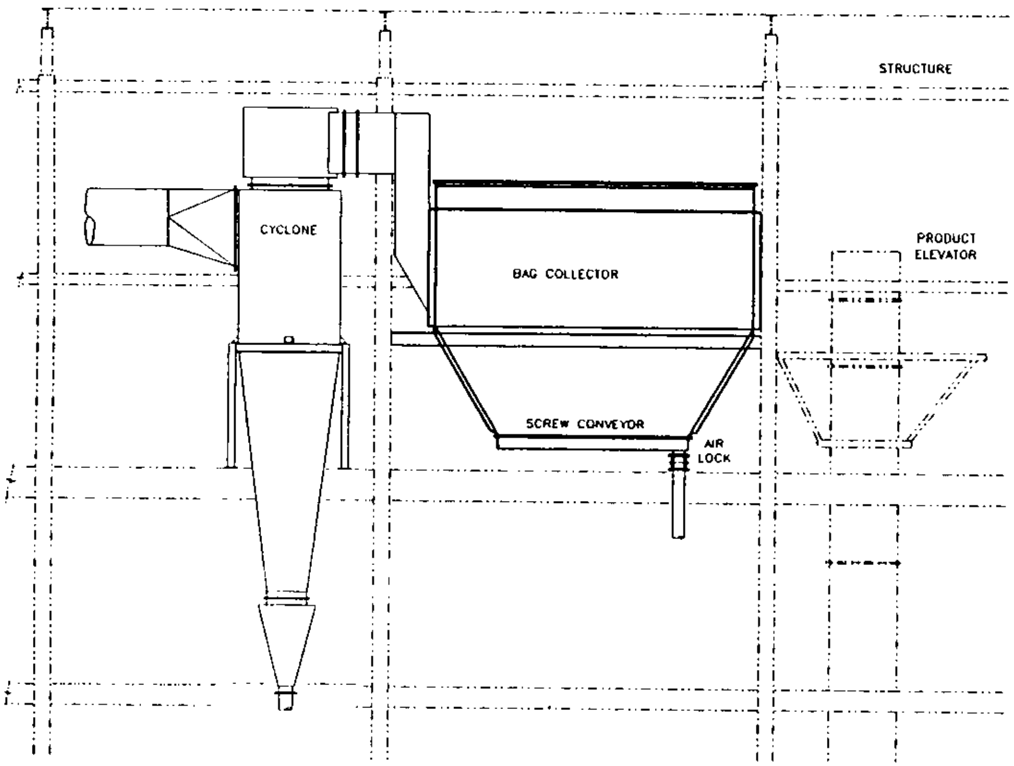
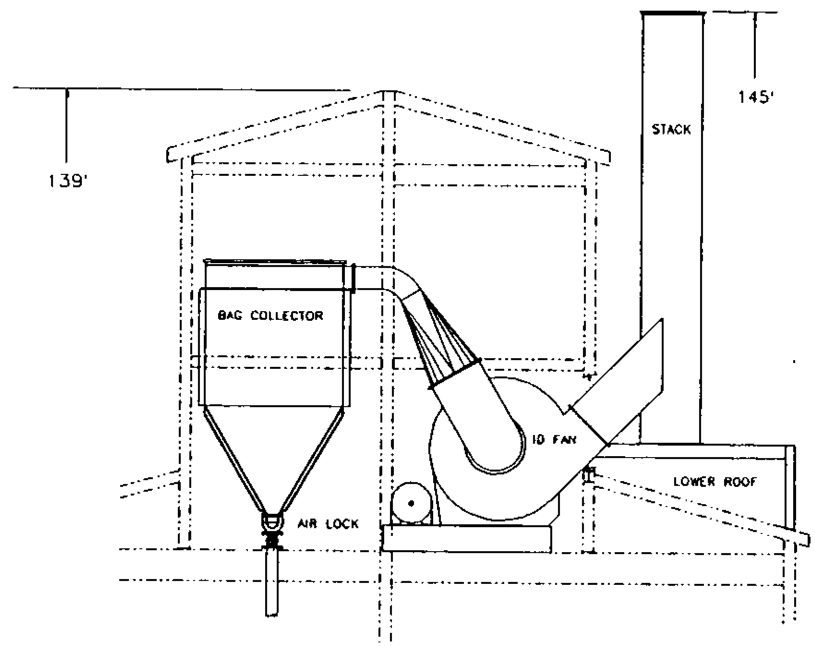


FIGURE 3.2 BAG COLLECTOR ARRANGEMENT VIEW



ELEVATION LOOKING NORTH



ELEVATION LOOKING WEST

FIGURE 3.3 BAG COLLECTOR ELEVATION VIEWS

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 pre-construction 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 40 CFR 52.21, 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 (F.A.C.). 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 500-1) 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 500-2).

Table 500-1 Major Facility Categories

(List of 28) [Reference: 17-2.500(2)(b)1.]

1. Carbon black plants (furnace process)
2. Charcoal production plants
3. Chemical process plants
4. Coke oven batteries
5. Coal cleaning plants (with thermal dryers)
6. Fossil fuel boilers (or combinations thereof) totaling more than 250 million Btu/hr heat input
7. Fossil fuel fired steam electric plants of more than 250 million Btu/hr heat input
8. Fuel conversion plants
9. Glass fiber processing plants
10. Hydrofluoric acid plants
11. Iron and steel mill plants
12. Kraft pulp mills
13. Lime plants
14. Municipal incinerators capable of charging more than 250 tons of refuse per day
15. Nitric acid plants
16. Petroleum refineries
17. Petroleum storage and transfer units with total storage capacity exceeding 300,000 barrels
18. Phosphate rock processing plants
19. Portland cement plants
20. Primary aluminum ore reduction plants
21. Primary copper smelters
22. Primary lead smelters
23. Primary zinc smelters
24. Secondary metal production plants
25. Sintering plants
26. Sulfuric acid plants
27. Sulfur recovery plants
28. Taconite ore processing plants

Table 500-2 Regulated Air Pollutants - Significant Emission Rates

[Reference: 17-2.500(2)(e)2.]

Pollutant	Significant Tons per Year	Emission Rate Pounds Per Year
Carbon monoxide	100	----
Nitrogen oxides	40	----
Sulfur dioxide	40	----
Ozone	40 VOC*	----
Particulate matter	25	----
PM10	15	----
Total reduced sulfur (including H2S)	10	----
Reduced sulfur compounds (including H2S)	10	----
Sulfuric acid mist	7	----
Fluorides	3	----
Vinyl chloride	1	----
Lead	----	1200
Mercury	----	200
Asbestos	----	14
Beryllium	----	0.8

Note: VOC refers to Volatile Organic Compounds.

3.2.1 AMBIENT AIR QUALITY STANDARDS

The EPA and the state of Florida have developed/adopted ambient air quality standards, AAQS (see Table 300). 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 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 prevent any significant deterioration of existing air quality levels.

Table 300 Ambient Air Quality Standards

Sulfur Dioxide
- 1300 micrograms per cubic meter (0.5 ppm), max 3 hr concentration.*
- 260 micrograms per cubic meter (0.1 ppm), max 24 hr concentration.*
- 60 micrograms per cubic meter (0.02 ppm), Annual Arithmetic mean.

PM_{10}
- 150 micrograms per cubic meter, max 24 hr concentration.*
- 50 micrograms per cubic meter, Annual Arithmetic mean.

Carbon Monoxide
- 35 parts per million (40 micrograms per cubic meter), max 1 hr concentration.*
- 9 parts per million (10 micrograms per cubic meter), max 8 hr concentration.*

Ozone
- 0.12 parts per million (235 micrograms per cubic meter), max 1 hr concentration.*

Nitrogen Dioxide
- 100 micrograms per cubic meter (0.05 ppm), Annual Arithmetic mean.

Lead
- 1.5 micrograms per cubic meter, Max Quarterly Arithmetic mean.

* Concentration not to be exceeded more than once per year.

3.2.2 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.

> 17-2.100(28) "Best Available Control Technology" or "BACT" - An emission limitation, including a visible emissions 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 each 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 for applicable pollutants and to allow future growth without significantly degrading air quality. The BACT review also assures that the most current control systems available are incorporated in the design of a proposed facility. 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.

In December 1987, EPA suggested, in policy form, that the implementation of the PSD program include 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. Recently, in July 1990, EPA was ordered to recind this policy. To date, no final policy has been issued to replace this approach other than the original "bottom-up" approach which was originally used. For this analysis, the "top-down" approach was used.

3.2.3 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, may be required for any pollutant for which ambient air quality standards have been established (other than nonmethane hydrocarbons). For any air pollutant for which no ambient air quality standards have been established, monitoring data may be required by the Department. 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 minimus levels (see Table 500-3) or if no ambient air quality standards have been established.

Table 500-3 De Minimus Ambient Impacts

[Reference: 17-2.500(3)(e)1.]

Pollutant	Average Concentration (Micrograms Per Cubic Meter)				
	Annual	Qtrly	24-Hr	8-Hr	1-Hr
Nitrogen dioxide	14	----	----	----	----
Vinyl chloride	----	----	15	----	----
Sulfur dioxide	----	----	13	----	----
Total suspended particulate	----	----	10	----	----
PM_{10}	----	----	10	----	----
Fluorides	----	----	0.25	----	----
Mercury	----	----	0.25	----	----
Lead	----	0.1	----	----	----
Beryllium	----	----	0.001	----	----
Carbon monoxide	----	----		575	----
Hydrogen sulfide	----	----		----	0.2
Ozone	No de minimus air quality level is provided for ozone. However, any net increase of 100 tons per year or more of volatile organic compounds subject to NSR would be required to perform an ambient impact analysis, including the gathering of ambient air quality data.				

3.2.4 AMBIENT IMPACT ANALYSIS

An 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 record of meteorological data is used for the evaluation of the highest, second-high short-term concentrations for comparison to AAQS or PSD increments. The term "highest, second-high" refers to the highest of the second-highest concentrations at all receptors. The second-high concentration is considered because short-term AAQS specify that the standard shall 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.

3.2.5 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.

3.2.6 GOOD ENGINEERING PRACTICE STACK HEIGHT

In accordance with Chapter 17-2.270, F.A.C., the degree of emission limitation required for control of any pollutant is not to be affected by a stack height that exceeds Good Engineering Practice (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:

$$H_g = H + 1.5\,L$$

where:

- H_g GEP stack height,
- H Height of the structure or nearby structure,
- and L Lesser dimension, height or projected width of nearby structure(s),

or 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 addition of the Air Classifier to the AFI Plant is classified as a modification to a major facility subject to both state and federal regulations as set forth in Chapter 17-2, F.A.C.. The facility is located in an area classified as attainment for each of the regulated air pollutants and the New Wales complex is beyond 100 km from the nearest Class I area. The proposed source addition to the existing AFI plant results in significant increases in particulate emissions as defined by Rule 17-2.500(2)(e)2, F.A.C.(see Table 500-2) The project will, therefore, be subject to PSD pre-construction review requirements in accordance with F.A.C. Rule 17-2.500 for particulate matter. 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.

4. BEST AVAILABLE CONTROL TECHNOLOGY

Best Available Control Technology (BACT) is required to control air pollutants emitted from newly constructed major sources or from a modification to a major emitting facility if the modification results in significant increase in the emission rate of regulated pollutants (see Table 500-2 for Significant Emission Levels).

The AFI plant air classifier will emit particulate matter. The emission rate increase will be a maximum of 43.5 TPY. The particulate emission increase from the proposed project will represent a significant increase based on 17-2.500(2)(e)2., F.A.C. A BACT analysis is required for particulate matter.

4.1 EMISSION STANDARDS

Federal New Source Performance Standards (NSPS) have been promulgated for Phosphate Fertilizer plants. These standards became effective on October 22, 1974, and are codified in 40 CFR 60, Subparts T, U, V, W, and X. These standards regulate only fluoride emissions and therefore do not apply to this proposed project.

A review of BACT/LAER determinations published in the EPA Clearinghouse indicates that no new particulate control alternatives were added for source code 7.6 through July 1991.

This unit will be added to a facility which is RACT exempt due to modelling and emissions limitation reductions for the particulate air quality maintenance area in Hillsborough County. This unit will be exempt from RACT due to BACT review.

There will no contemporaneous emission changes which can be quantified associated with this project. The two screens that will serve as overflow capacity are vented into the plant emission control system. The inlet loading will be reduced to that system's control device because of the use of the air classification system. The unit will be an additional source of emissions.

The overall operations of the AFI Plant will not change with the addition of the new air classification system. The product storage, handling and loading system rates of operation will not be affected. There will be a reduction in the fugitive dust associated with these activities, but the amount is not quantifiable.

4.2 CONTROL TECHNOLOGY

At fertilizer product type plants, either bag collectors or wet scrubbing equipment are conventionally applied for the removal of particulate effluent gas streams associated with finished granular products. The control of emissions from the proposed air classification system could be either a bag collector or a medium energy venturi wet scrubber operating at 18 inches of pressure drop. The inlet loading to these devices will contain only fine particles since it will first pass through a product recovery cyclone. The current electrical capacity in the AFI plant, at the proposed location of the new system, can support a 250 hp fan for the control device. It is estimated that an additional 150 hp would be required for a venturi scrubber to operate at 18 inches of pressure drop. Three systems were analyzed to determine the BACT for this installation. One was based on the bag collector, and the other two used venturi scrubbers. One of the scrubber systems was based on the power available, and the second considered the additional electrical capacity for the higher pressure drop of 18 inches.

The venturi scrubber using the power available is considered as the base case. The economic and energy analysis are summarized in Table 4.1. The impacts from the project are summarized in Table 4.2. These tables analyses were prepared in accordance with the materials presented in the "Prevention of Significant Deterioration, Workshop Manual, October 1980" developed by EPA.

TABLE 4.1
ECONOMIC AND ENERGY ANALYSIS

120 TPH PRODUCT RATE
3.42 GR/SCF CYCLONE DISCHARGE
225 PRODUCT PRICE $/TON
58000 CFM

	BAGHSE	VENTURI	LOW VENTURI	
LB/TON EMISSION RATES	0.08	0.28	0.71	
LB/HR	9.94	34.00	85.01	= EFF x 3.42/7000 x 58000 x 60
EFFICIENCIES	0.994	0.980	0.950	
OPERATING COSTS:				
UTILITIES $	21993	49484	27491	IGNORES CYCLONE AND DUCT LOSSES
MAINTENANCE $	24000	48000	36000	8 PERCENT OF CAPITAL
PROCESS MATERIALS $	9799	33512	83779	LOSS OF PRODUCT AS EMISSION
OTHER $	4500	9000	6750	TAXES AND INSURANCE 1.5%
TOTAL $	60292	139996	154020	
AVG FIVE YEAR COST $	70741	164260	180715	0.08 INFLATION
INCREMENTAL $	−93518	−16455		
CAPITAL COSTS:				
TOTAL $	300000	600000	450000	AIR POLLUTION CONTROL EQUIPMENT
INCREMENTAL $	−300000	150000		
ANNUALIZED $	103848	207696	155772	
INCREMENTAL $	−103848	51924		
OPERATING AND ANN CAP $	174589	371956	336487	
INCREMENTAL $	−197366	35469		
CONTROLLED EMISSIONS:				
TOTAL TPY	7403	7298	7075	BASED ON 8760 HOURS
INCREMENTAL TPY	105	223		
COST−EFFECTIVENESS $/T	24	51	48	
INCREMENTAL $/T	−1873	159		
PRESSURE DROP	8	18	10	IGNORES PUMPING AND AIR
DEVICE BHP	122	274	152	COMPRESSOR OPERATION POWER
DUCT LOSS	2	6	6	VENTURI LOCATION AT GRD LEVEL
DUCT BHP	30	91	91	
CYCLONE DROP	4.5	4.5	4.5	
CYCLONE BHP	68	68	68	
TOTAL	221	433	312	
HP−HR/1000	1932	3797	2731	BASED ON 8760 HOURS AS EMISSIONS
KW−HR/1000	2552	5016	3608	
KW−HR/TON	345	687	510	
INCREMENTAL KW−HR/TON	−343	177		

TABLE 4.2 COMPARISON OF ALTERNATIVE IMPACTS										
Particulate		Economic			Environmental			Energy		
	Red.	$/ton Incr.	$/ton total	Impact Issues	max GLC	Impact areas	Impact Issues	kwh/ton Incr.	kwh/ton total	Impact Issues
Bag Collector	0.99	−1873	24	none	20	250 m	inside *	−343	345	none
18" Drop Venturi	0.98	159	51	loss *	69	250 m	outside *	177	687	none
10" Drop Venturi	0.95		48	loss *	172	250 m	outside *		510	none
				* Product			* Property boundaries			

4.3 BACT CONCLUSION

The bag collector provides the Best Available Control Technology. Economically, the use of the bag collector allows the recovery of collected material for recycle back into the process. The materials collected in a wet system would also be returned via the wet portion of the process. More material is recovered when the bag collector is considered. Environmentally, the significant impact of the bag collector emissions are confined to within IMCF property boundaries. The two wet systems would impact beyond these boundaries. The wet scrubber systems would require a minor amount of additional consumption of the water resources allotted to the New Wales complex by its SWFWMD permit. The overall consumption of energy by the bag collector and the base scrubber is the same. Because the higher collection rate by the bag collector, it is more energy efficient to use. The use of the bag collector is proposed as BACT for this project.

5. 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 may be required when the impact of air pollutant emission increases and decreases associated with a proposed project exceeds the pollutant specific de minimus impact levels defined by Rule 17-2.500(3)(e)1, F.A.C. (See Table 500-3) or in cases where an applicant wishes to define existing ambient air quality by monitoring rather than by air quality modeling. Monitoring is required for air pollutants for which air quality standards have been established and may be required for pollutants for which no air quality standards exist (Rule 17-2.500(5)(f)1, F.A.C.).

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 or guideline. Particulate emissions are the only pollutant subject to the review.

The de minimus impact level (see Table 500-3) for Particulate matter, TSP and PM_{10}, associated with the proposed project is 10 micrograms per cubic meter, 24-hour average, for each. The air quality review for the proposed project, which evaluated the particulate emission increase associated with this modification, demonstrated that the ambient air impact of particulate emission increase will not be greater than the 24-hour de minimus impact level. No significant impact of the emission is predicted beyond IMCF property boundaries. Therefore, monitoring should not be required.

5.1 AIR QUALITY MODELLING

The modelling of particulate emission was conducted in accordance with EPA modelling guidelines with the Industrial Source Complex - Short Term (ISC-ST) air quality model, Version 90346. The meteorological data used with the model were for Tampa, Florida 1982-1986. The model was run using the Regulatory Default option settings and with maximum building wake effects on plume downwash taken into consideration. Model receptors were located by a polar coordinate grid centered at 396.707 km East and 3079.344 km North. Non-discreet receptors were located at ten degree intervals around the plant at ten radial distances ranging from 250 meters to 1564 meters. Additional discreet receptors were included to mark points along the property boundaries, to locate the New Wales ambient monitoring station, and to locate the Chassahowitzka National Wildlife Refuge for informational purposes. These are shown in Table 5.1. Because of the effect of plume downwash, maximum particulate impacts were predicted to be a 24 hour average of 20.2 microgram/m^3 at the 250 meters from the stack at the 250 degrees.

The source used in the modelling was the new AFI air classifier. No attempt was made to model particulate emissions from other quantifiable sources at New Wales or other Polk County sources. The source data used for modeling are summarized in Table 5.2 and Figure 5.1.

TABLE 5.1 Discreet Receptor Data

			Offsets		Dist	Direction
PLANT LOCATION	396.554 East	3078.908 North				
POLAR GRID CENTER	396.707	3079.344				
RECEPTOR LOCATIONS			East	North	Km	degrees
R1	396.554	3080.901	-153	1557	1.564	354.4
R2	397.200	3080.892	493	1548	1.625	17.7
R3	397.695	3080.285	988	941	1.364	46.4
R4	397.695	3079.630	988	286	1.029	73.9
R5	398.005	3079.265	1298	-79	1.300	93.5
R6	401.072	3079.265	4365	-79	4.366	91.0
R7	403.701	3080.894	6994	1550	7.164	77.5
R8	403.224	3079.265	6517	-79	6.517	90.7
R9	403.129	3075.236	6422	-4108	7.623	122.6
R10	402.958	3075.008	6251	-4336	7.608	124.7
R11	393.713	3077.313	-2994	-2031	3.618	235.8
R12	392.970	3079.923	-3737	579	3.782	278.8
R13	394.132	3080.132	-2575	788	2.693	287.0
R14	394.437	3080.494	-2270	1150	2.545	296.9
R15	395.275	3080.894	-1432	1550	2.110	317.3
R16	396.075	3080.894	-632	1550	1.674	337.8
R17	340.359	3165.079	-56348	85735	102.6	326.7

TABLE 5.2 Source Data for Model Runs

Stack Name AFI AIR CLASSIFER

Temperature	105	deg F	255.2	deg K
Stack Diameter	4.54	ft	1.38	m
ACFM	58000	acfm		
Stack Area	16.19.	sq ft		
Stack Velocity	59.7	fps	18.20	mps
Particulate Emission	9.94	lb/hr	1.253	gps
Stack Height	145	ft	44.2	m
Building Height	139	ft	42.4	m
Building Width (N-S)	33	ft	10.1	m
Building Length (E-W)	105	ft	32.0	m
Max Projected Width	110	ft	47.7	m
Plant Elevation	158	ft	33.5	m
UTM Coordinates			396.707	km East
			3079.344	km North

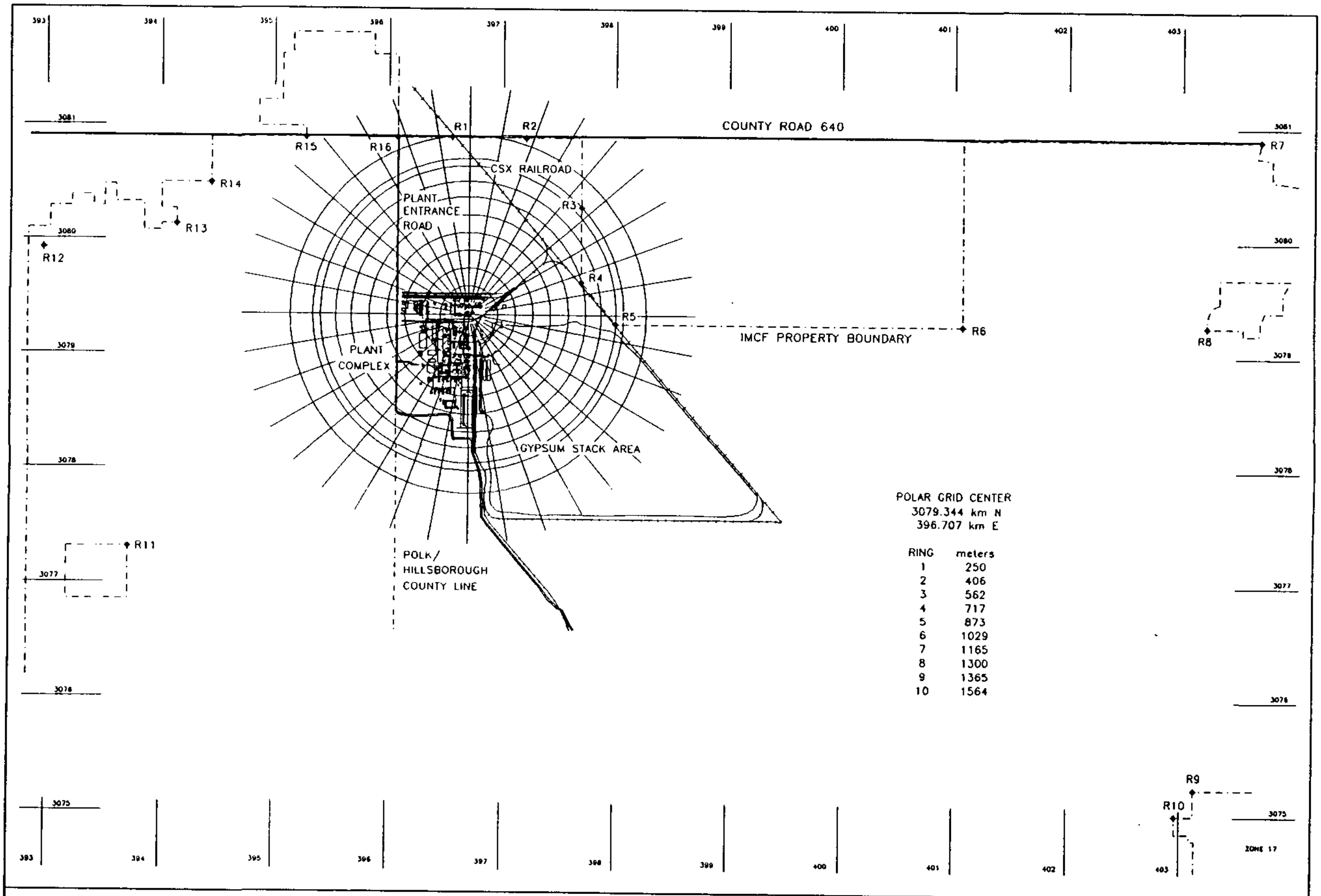


FIGURE 5.1 RECEPTOR LOCATIONS

5.2 AIR QUALITY MODELLING RESULTS

The results of the ambient air quality impact analysis for particulate are presented below. The emission rate for particulates used for air quality modelling purposes is the proposed BACT allowable emission rate of 9.94 lb/hr.

Area of Significant Impact. The emissions from the addition of the AFI stack will produce no significant impact to the Ambient Air quality beyond the property boundaries of IMCF as defined in 17-2.100(193)(b)1., F.A.C. The model was evaluated for three cases, consideration of the Huber-Snyder wake effects (Case 1) and consideration of Schulman-Scire wake effects method for building and direction relationships (Case 2) and for maximum projected width in all directions (Case 3). The Huber-Synder method placed the 5 mirco-gram/cubic meter second highest concentrations within the 873 meter ring. When the building directional relationships with the stack were used in the Schulman-Scire method, the second highest, 24 hour, 5 microgram/cubic meter was located at the 1300 meter ring in the 220 degree direction. The closest point of the property boundary to the stack is located at ring 1029 meters and at 74 degrees. To evaluate that possibility, the Schulman-Scire method was used with the Maximum Projected Width in all directions. The Area of Significant Impact did not extend beyond the IMCF property boundary. The building dimensions and stack are shown in Figure 5.3. The results of these three cases are shown in Figure 5.4 which shows the maximum, worse case, predicted area of significant impact as Case 3.

The building dimensions that were used were that portion of the building designated as Bldg A shown in Figure 5.2. The two portions of the building, A and B, were evaluated and A had the maximum impact on modeled concentrations.

Two additional modelling runs were done to evaluate the impact of the BACT alternatives discussed in Section 4. The model was operated in the Schulman-Scire worst case with the MPW projected in all directions. The Areas of Significant Impact for each of the control technologies are shown in Figure 5.5,

Impacts at Property Line. The maximum annual increase of 0.35 ug/m^3 at the propriety line occurs at R4. The maximum 24-hour increase of 4.2 ug/m^3 will be at the property line point R4.

	MAXIMUM - PROPERTY LINE			
	24-HR		ANNUAL	
YEAR	ug/m^3	RECEPTOR	ug/m^3	RECEPTOR
82	2.7	R4	0.22	R4
83	3.1	R4	0.25	R4
84	3.2	R4	0.24	R4
85	4.2	R4	0.30	R4
86	3.8	R4	0.35	R4

Impacts at Monitoring Station. The location of the station was Receptor 12. It was modeled for the purpose of identifying possible increase in impact. At the levels projected, the impact will be below the accuracy of the measurement.

	MAXIMUM - MONITORING STATION RECEPTOR 12			
YEAR	24-HR		ANNUAL	
82	1.73	ug/m^3	0.13	ug/m^3
83	0.85	ug/m^3	0.11	ug/m^3
84	1.13	ug/m^3	0.13	ug/m^3
85	1.13	ug/m^3	0.11	ug/m^3
86	1.25	ug/m^3	0.13	ug/m^3

Impact on Chassahowitzka National Wildlife Refuge. Receptor 17, located at the point closest to the modeled source, was predicted using the model for informational purposes since the distance to the preserve is 103 km. This distance exceeds the applicability of the ISCST model. The maximum 24 hr impact is 0.03 ug/m^3 which is negligible considering the inapplicability of the model.

	MAXIMUM - RECEPTOR 17			
YEAR	24-HR		ANNUAL	
82	0.02	ug/m^3	0.00	ug/m^3
83	0.02	ug/m^3	0.00	ug/m^3
84	0.01	ug/m^3	0.00	ug/m^3
85	0.03	ug/m^3	0.00	ug/m^3
86	0.02	ug/m^3	0.00	ug/m^3

Discussion of Modeling Results. Figure 5.4 locates the Area of Significant Impact as defined by the 5 ug/m^3 concentration for the second highest 24 hour impact predicted from the model. The model was evaluated for the worst case by using the maximum projected width for the building in all directions. This was done to establish that in the five-year period of meteorological data used, it would be impossible for the plumes in the southerly direction to have a significant impact off IMCF property. The results show that this is the case and therefore does not require modelling of emissions of additional sources since this source cannot contribute to an ambient standard violation beyond the IMCF property boundaries.

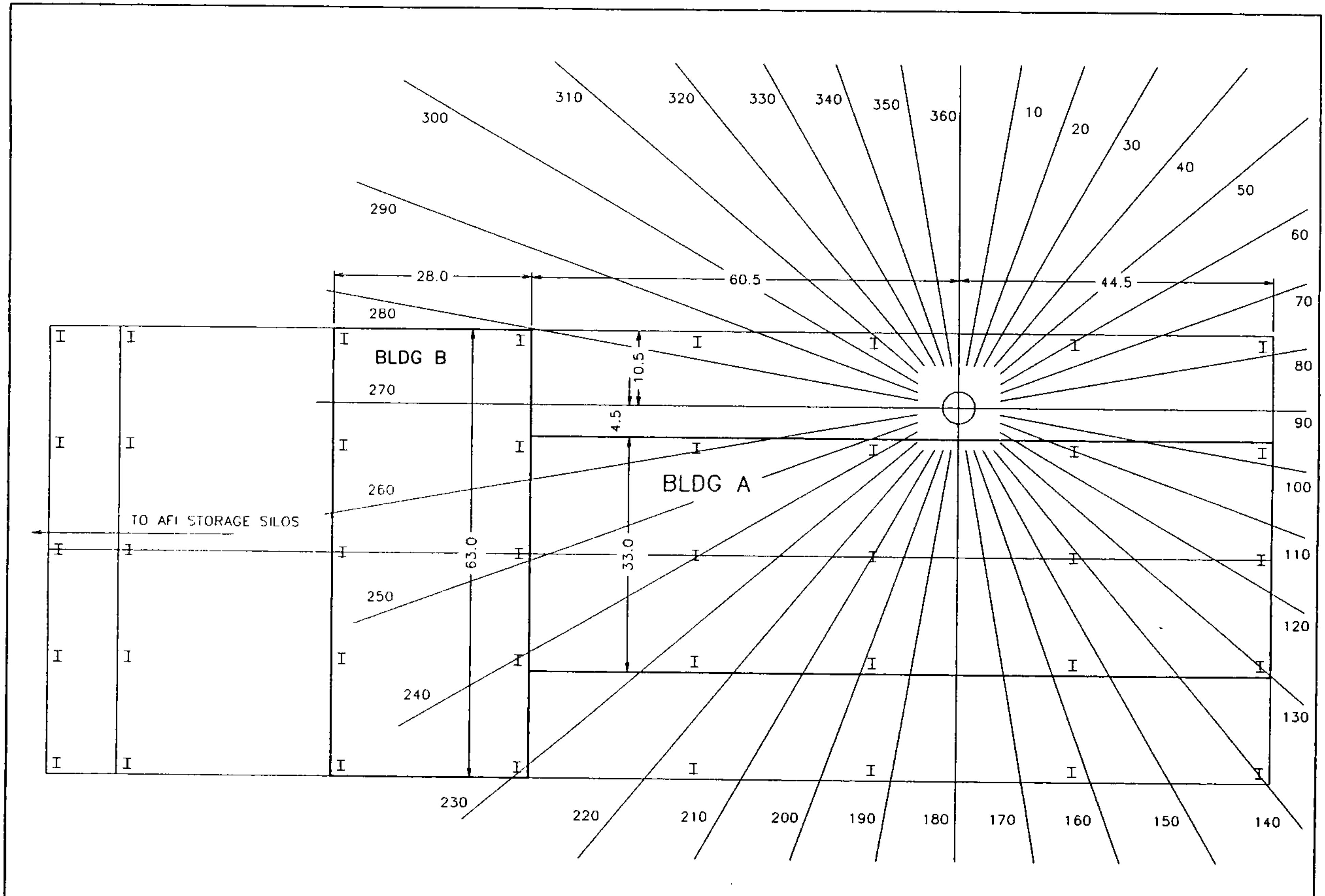


FIGURE 5.2 AFI BUILDING AND STACK RELATIONSHIP

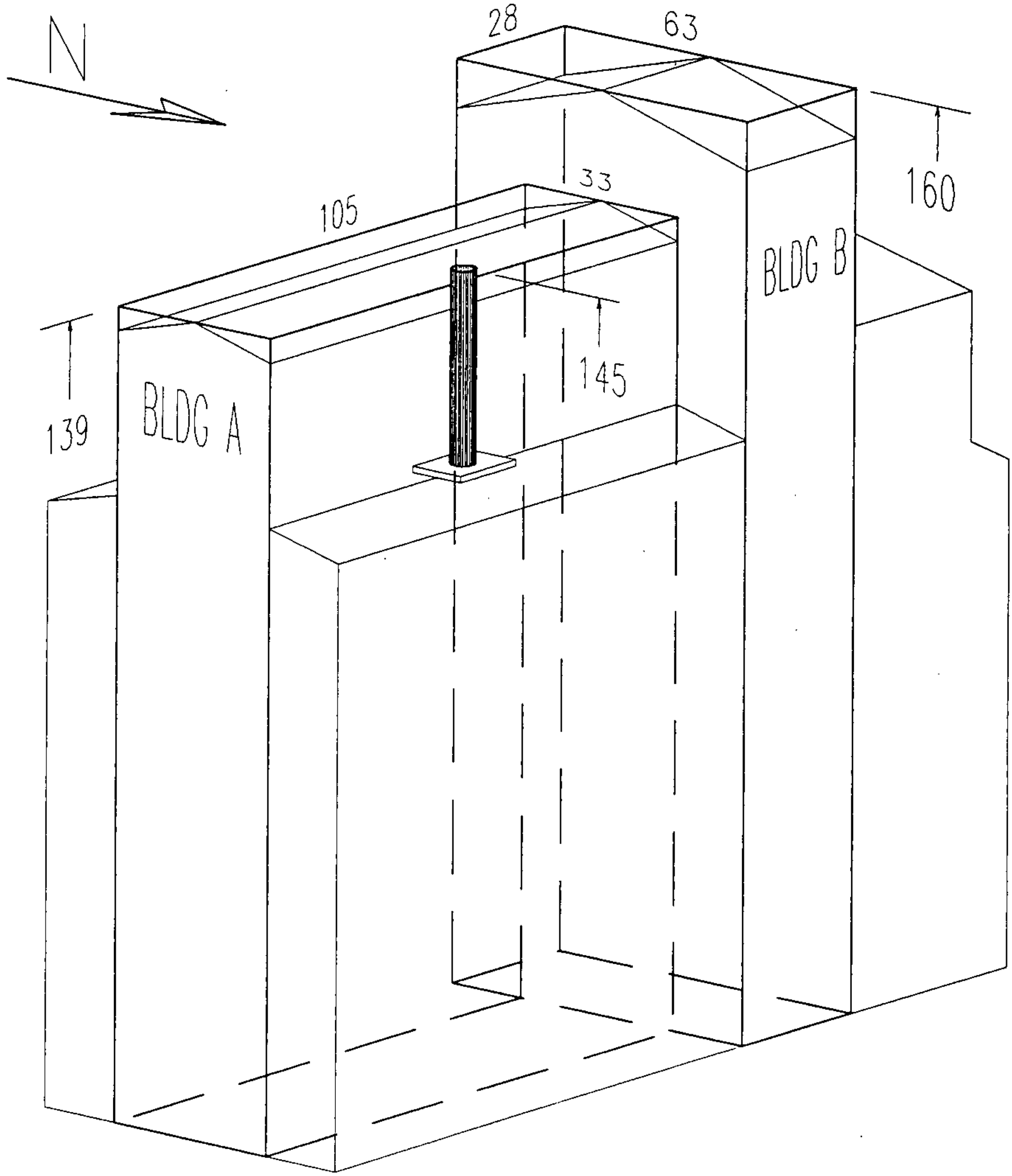


FIGURE 5.3 3-D VIEW OF BUILDING AND STACK

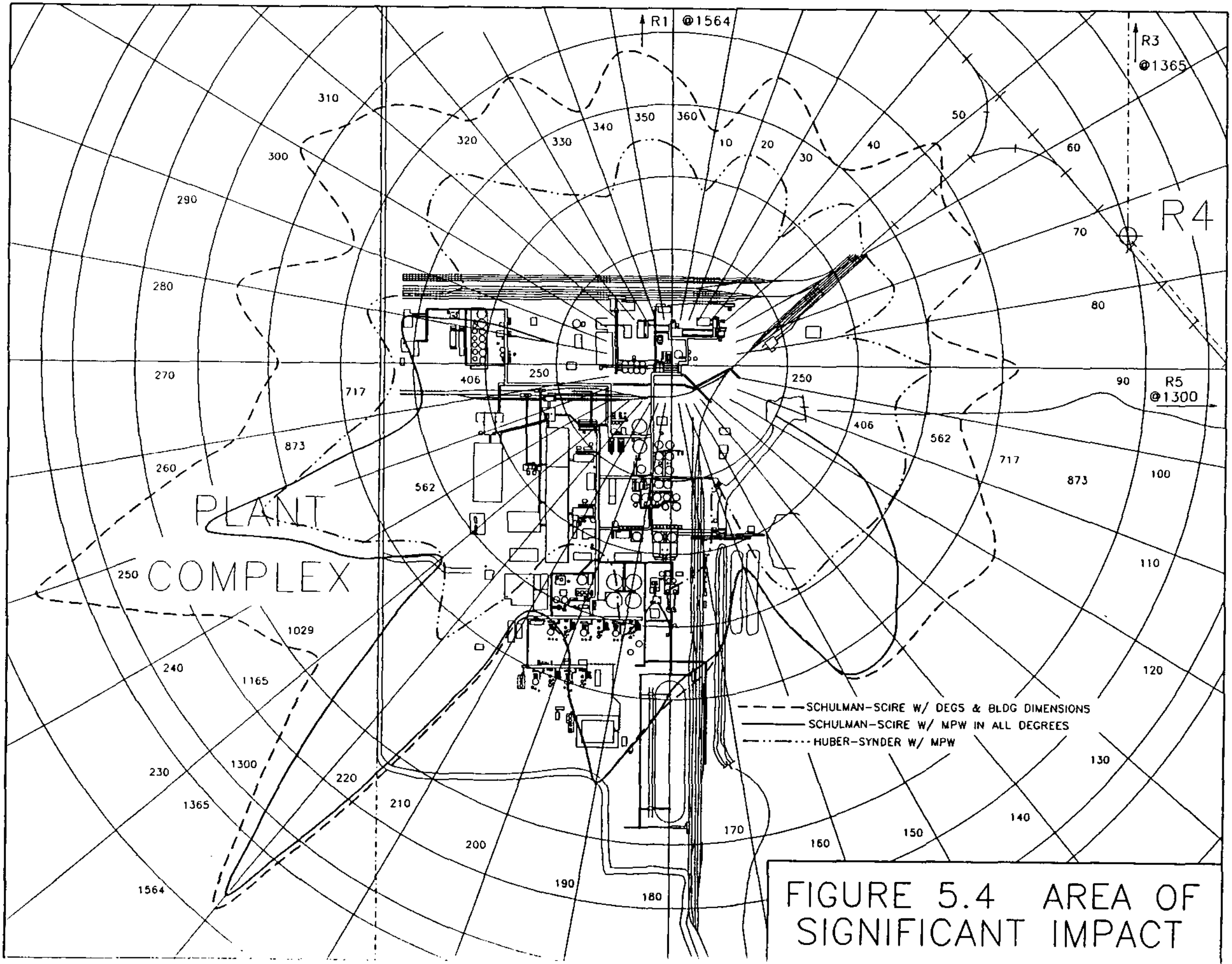


FIGURE 5.4 AREA OF SIGNIFICANT IMPACT

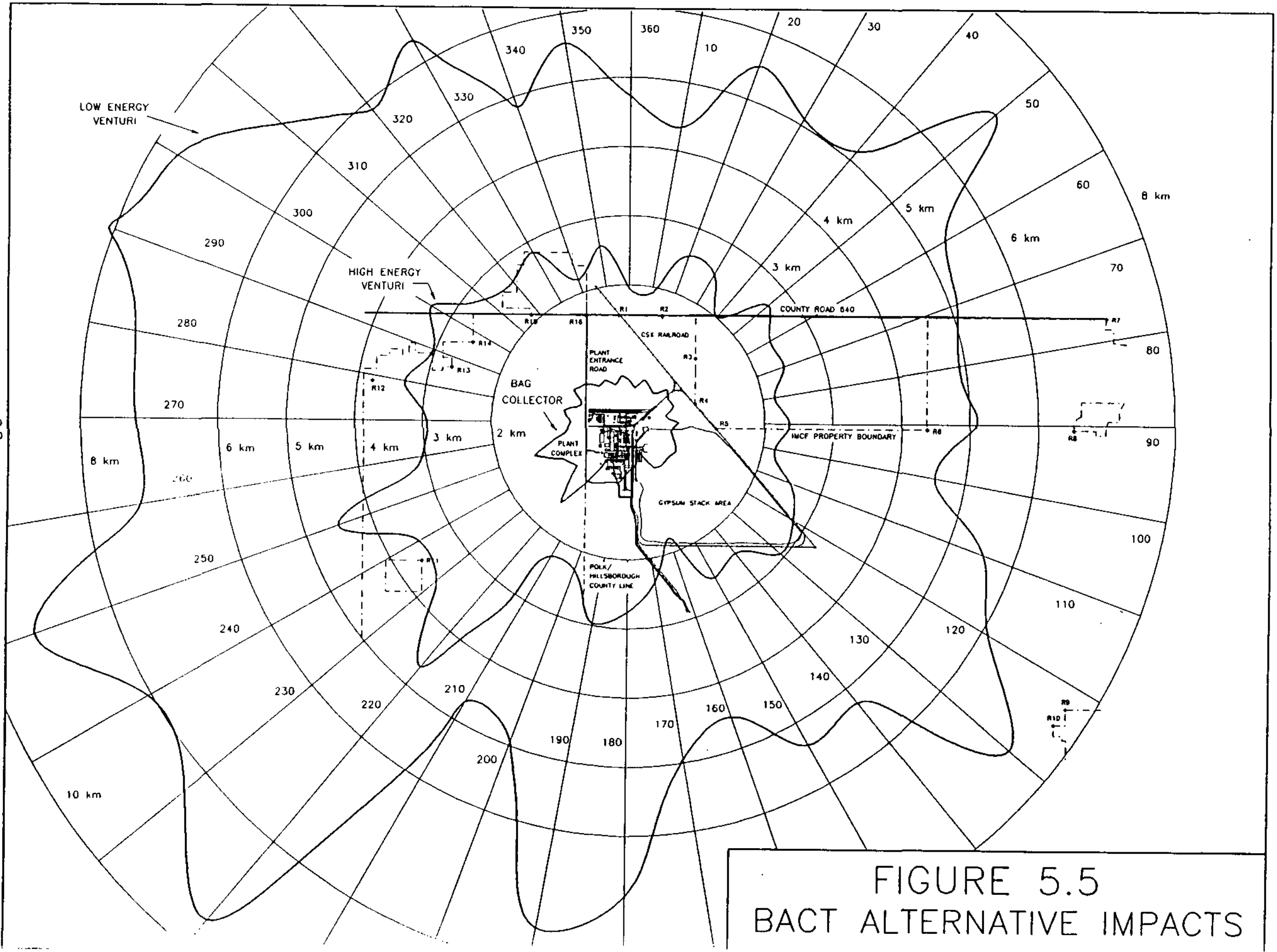


FIGURE 5.5
BACT ALTERNATIVE IMPACTS

6. GOOD ENGINEERING PRACTICE STACK HEIGHT

The criteria for good engineering practice stack height in Rule 17-2.270, F.A.C., 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 the achievement of ambient air quality goals solely through the use of excessive stack heights and air dispersion.

The AFI plant stack is less than 213 feet in height above-grade. The new stack will be 145 feet in height. This satisfies the good engineering practice (GEP) stack height criteria.

It should be noted that building effects were considered in the modelling using the building dimensions shown in Figure 5.3. The impact of each building was considered in each flow vector direction by calculating the value of 5L based on the apparent building dimensions in that direction. The results of these calculations are shown in Table 6.1. The storage silos were not considered because they are located due west of the AFI plant building. They are west of the portion designated Bldg. "B" and would have less effect than that portion of the building. The dimensions shown were used in the model runs. The model was run for consideration of both wake effect calculation methods as discussed in Section 5.

Table 6.1 GEP Stack Height Analysis

Analysis of Building/Structure in Complex Adjacent to AFI Stack (Dimensions in ft)

Structure	Ht	L E/W	W N/S	PW	L	5L	Dist	<5l
Rock Silos	103	50	91	76	76	381	1703	0
E/W Phos Acid	106	30	210	90	90	448	1119	0
3Rd Phos Acid	134	36	164	87	87	434	1148	0
DAP 2 E/W	123	154	79	124	123	615	1247	0
DAP/GTSP Storage	73	960	152	431	73	363	856	0
DAP Storage	100	410	200	323	100	500	1329	0
MAP Tower	130	15	23	21	21	105	1250	0
GTSP Plant	122	40	25	36	36	178	837	0
DAP 1 Plant	122	40	25	36	36	178	1145	0
MAP Storage	82	139	233	203	82	410	1391	0
2 Truck L/O	135	30	60	48	48	239	1237	0
2 Rail L/O	110	30	30	34	34	169	928	0
AFI Bldg B	160	63	28	47	47	237	61	1
AFI Bldg A	139	33	105	66	66	332	5	1
Multifos Screen	109	21	39	32	32	159	279	0
Mixed Feed Bldg	118	45	34	44	44	221	394	0
Silica Bin	101	29	29	29	29	147	397	0
AFI Silos	126	82	164	131	126	628	187	1

Structure and Directional Relationships for AFI Stack (Dimensions in ft)

deg	structure	ht	n/s	e/w	dist	pw	L	5L	<5L
10						0	0	0	0
20						0	0	0	0
30						0	0	0	0
40						0	0	0	0
50						0	0	0	0
60						0	0	0	0
70						0	0	0	0
80						0	0	0	0
90						0	0	0	0
100	AFI Bldg A	139	33	105	25.91	51	51	254	1
110	AFI Bldg A	139	33	105	13.15	67	67	335	1
120	AFI Bldg A	139	33	105	9	81	81	405	1
130	AFI Bldg A	139	33	105	7.000	93	93	464	1
140	AFI Bldg A	139	33	105	5.874	102	102	508	1
150	AFI Bldg A	139	33	105	5.196	107	107	537	1
160	AFI Bldg A	139	33	105	4.788	110	110	550	1
170	AFI Bldg A	139	33	105	4.569	109	109	546	1
180	AFI Bldg A	139	33	105	4.5	105	105	525	1
190	AFI Bldg A	139	33	105	4.569	109	109	546	1
200	AFI Bldg A	139	33	105	4.788	110	110	550	1
210	AFI Bldg A	139	33	105	5.196	107	107	537	1
220	AFI Bldg A	139	33	105	5.874	102	102	508	1
230	AFI Bldg B	160	63	28	78.97	66	66	331	1
240	AFI Bldg B	160	63	28	69.85	69	69	343	1
250	AFI Bldg B	160	63	28	64.38	69	69	344	1
260	AFI Bldg B	160	63	28	61.43	67	67	335	1
270	AFI Bldg B	160	63	28	60.5	63	63	315	1
280	AFI Bldg B	160	63	28	61.43	67	67	335	1
290						0	0	0	0
300						0	0	0	0
310						0	0	0	0
320						0	0	0	0
330						0	0	0	0
340						0	0	0	0
350						0	0	0	0
360						0	0	0	0

7. IMPACTS ON SOILS, VEGETATION AND VISIBILITY

The impact of particulate emissions on soils, vegetation and visibility are addressed below.

7.1 IMPACTS ON SOILS AND VEGETATION

The U.S. Environmental Protection Agency (EPA) has promulgated ambient air quality standards for particulate matter, sulfur dioxide, nitrogen oxides, carbon monoxide, ozone, and lead. These standards include primary air quality standards developed for the protection of human health and secondary air quality standards developed for the protection of welfare-related issues.

The land in the vicinity of IMCF-New Wales 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

Most 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 New Wales 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 thicknesses. 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 IMCF-New Wales's air pollutant levels when they lie downwind of the facility. The areas other than those downwind of the facility will be exposed to existing concentrations of air pollutants from other emitting facilities in the immediate area.

The air quality modelling that has been conducted as a requirement of this PSD application, demonstrates that the levels of particulate expected at New Wales, as a result of the this proposed project, will be below the level of Significant Impact outside the property boundaries. As a result, it is reasonable to conclude that there will be no change in the ambient effects of particulates on the soils or the vegetation of the area.

7.2 GROWTH-RELATED IMPACTS

The proposed modification will not change the AFI plant's production rates. It only changes how the process stream is treated. There will be no change in production-related activities either. 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 particulate emissions which are not expected to have adverse impacts on visibility for the Chassahowitzka NWR. This is confirmed in Table 7.1 which contains the summary results from the Viscreen model. The complete results are contained in Appendix B.

Table 7.1 Visibility Impact Summary

Visual Effects Screening Analysis for
Source: AFI
Class I Area: CHASSAHOWITZKA NWR

*** Level-1 Screening ***

Input Emissions for

Particulates	9.94	LB /HR
NOx (as NO2)	.00	LB /HR
Primary NO2	.00	LB /HR
Soot	.00	LB /HR
Primary SO4	.00	LB /HR

**** Default Particle Characteristics Assumed

Transport Scenario Specifications:

Background Ozone:	.04 ppm
Background Visual Range:	25.00 km
Source-Observer Distance:	103.00 km
Min. Source-Class I Distance:	103.00 km
Max. Source-Class I Distance:	117.00 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.	103.0	84.	2.00	.008	.05	.000
SKY	140.	84.	103.0	84.	2.00	.001	.05	.000
TERRAIN	10.	84.	103.0	84.	2.00	.001	.05	.000
TERRAIN	140.	84.	103.0	84.	2.00	.000	.05	.000

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.	70.	97.9	99.	2.00	.008	.05	.000
SKY	140.	70.	97.9	99.	2.00	.001	.05	.000
TERRAIN	10.	60.	94.2	109.	2.00	.001	.05	.000
TERRAIN	140.	60.	94.2	109.	2.00	.000	.05	.000

8. CONCLUSION

It can be concluded from the information in this report that the proposed addition of the air classifier with the associated bag collector to the AFI plant 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, F.A.C.

APPENDIX A MODEL RUN SUMMARIES

Table A.1 Years 1982-1986 2nd High Concentration, Run AWL

Table A.2 Years 1982-1986 2nd High Concentration, Run AWM

Table A.3 Years 1982-1986 2nd High Concentration, Run AWN

Table A.4 Years 1982-1986 2nd High Concentration, Run AWO

Table A.5 Years 1982-1986 2nd High Concentration, Run AWP

Complete results submitted under separate cover.

Table A.1 Years 1982-1986 2nd High 24 hr Concentration, Run AWL

Wake Affect Used:
Schulman-Scire
MPW in all Directions

Parameters

Temperature	105	deg F
Stack Diameter	4.54	ft
ACFM	58000	acfm
Stack Area	16.19	sq ft
Stack Velocity	59.7	fps
Emission	9.94	lb/hr
Stack Height	145	ft
Building Height	139	ft
Width (N-S)	33	ft
Length (E-W)	105	ft
Max Proj Width	110	ft
Plant Elevation	0	ft

Concentrations in micrograms/cubic meter

Deg/ M:	250	406	562	717	873	1029	1165	1300	1365	1564
360	6.173	6.971	5.440	4.419	3.675	2.933	2.434	2.097	1.983	1.710
350	9.327	7.679	5.816	4.754	4.038	3.479	3.079	2.789	2.681	2.369
340	7.483	6.501	5.112	4.190	3.531	3.030	2.684	2.424	2.314	2.026
330	8.506	7.537	5.931	4.961	4.269	3.741	3.371	3.066	2.936	2.594
320	9.083	7.543	5.670	4.818	4.071	3.528	3.157	2.856	2.729	2.388
310	10.183	9.569	7.204	5.792	4.844	4.085	3.584	3.190	3.027	2.614
300	11.542	9.834	7.367	6.046	5.226	4.590	4.140	3.765	3.605	3.183
290	9.823	8.333	6.304	5.098	4.278	3.689	3.297	2.986	2.857	2.526
280	10.397	9.776	7.938	6.418	5.400	4.632	4.110	3.685	3.510	3.089
270	11.422	9.960	7.443	5.902	4.860	4.174	3.734	3.384	3.239	2.865
260	11.725	10.231	7.991	6.475	5.433	4.657	4.127	3.699	3.520	3.056
250	15.634	14.009	11.026	9.160	7.839	6.838	6.136	5.556	5.310	4.661
240	12.531	11.558	8.911	7.242	6.203	5.313	4.675	4.177	3.979	3.468
230	13.278	11.209	8.474	6.771	5.621	4.808	4.271	3.847	3.672	3.224
220	13.941	12.258	10.374	8.834	7.823	6.963	6.324	5.773	5.533	4.887
210	8.665	7.046	5.382	4.452	3.807	3.270	2.908	2.608	2.482	2.149
200	7.390	6.568	5.404	4.670	3.880	3.299	2.908	2.596	2.466	2.134
190	11.980	10.276	7.774	6.195	5.175	4.431	3.926	3.520	3.350	2.910
180	8.635	7.652	6.049	5.026	4.271	3.691	3.284	2.947	2.805	2.431
170	8.245	7.003	5.332	4.345	3.694	3.214	2.877	2.597	2.478	2.166
160	6.438	5.447	4.178	3.406	2.914	2.517	2.231	1.993	1.892	1.644
150	11.510	8.988	6.639	5.294	4.401	3.755	3.320	2.970	2.824	2.447
140	9.867	8.710	6.698	5.410	4.489	3.805	3.340	2.965	2.808	2.405
130	10.761	8.697	6.745	5.374	4.418	3.729	3.350	3.046	2.919	2.589
120	11.362	9.182	6.895	5.540	4.621	3.959	3.517	3.165	3.018	2.642
110	8.182	7.472	6.041	4.941	4.122	3.529	3.130	2.788	2.656	2.316
100	9.036	7.192	5.511	4.474	3.759	3.231	2.845	2.533	2.404	2.071
90	9.735	8.424	6.535	5.200	4.253	3.567	3.132	2.808	2.673	2.280
80	6.932	6.378	5.018	3.824	3.055	2.742	2.507	2.280	2.192	1.954
70	9.542	8.340	6.227	4.962	4.115	3.503	3.093	2.754	2.613	2.256
60	9.090	7.706	5.874	4.790	4.033	3.473	3.072	2.747	2.612	2.260
50	9.704	8.248	6.366	5.174	4.324	3.694	3.267	2.922	2.778	2.408
40	7.114	6.481	4.983	3.884	3.134	2.619	2.366	2.152	2.064	1.834
30	7.733	6.785	5.277	4.349	3.675	3.223	2.938	2.689	2.580	2.283
20	7.608	6.539	5.601	4.663	4.005	3.494	3.108	2.815	2.690	2.362
10	7.652	6.038	4.542	3.682	3.084	2.663	2.374	2.138	2.038	1.779
Maximums (All 15.63)	15.634	14.009	11.026	9.160	7.839	6.963	6.324	5.773	5.533	4.887

Table A.2 Years 1982-1986 2nd High 24 hr Concentration, Run AWM

Wake Affect Used:
Schulman-Scire
w/ Building Dimensions & Degs

Parameters

Temperature	105	deg F
Stack Diameter	4.54	ft
ACFM	58000	acfm
Stack Area	16.19	sq ft
Stack Velocity	59.7	fps
Emission	9.94	lb/hr
Stack Height	145	ft
Building Height	139	ft
Width (N-S)	33	ft
Length (E-W)	105	ft
Max Proj Width	110	ft
Plant Elevation	0	ft

Concentrations in micrograms/cubic meter

Deg/ M:	250	406	562	717	873	1029	1165	1300	1365	1564
360	0.671	2.364	2.514	2.128	1.711	1.646	1.615	1.558	1.525	1.304
350	0.669	1.490	1.488	1.486	1.412	1.373	1.221	1.161	1.143	1.120
340	0.800	1.749	1.898	1.809	1.494	1.218	1.128	1.098	1.079	1.012
330	0.781	1.732	1.760	1.611	1.664	1.617	1.487	1.342	1.280	1.115
320	0.777	1.652	1.849	1.748	1.578	1.659	1.638	1.586	1.554	1.445
310	0.961	1.807	2.135	1.981	1.906	1.896	1.797	1.685	1.631	1.471
300	1.160	2.525	2.205	2.011	2.008	2.019	2.091	1.977	1.921	1.756
290	1.797	2.821	2.368	1.927	1.702	1.504	1.476	1.431	1.405	1.304
280	4.957	5.673	5.111	4.320	3.780	3.298	2.933	2.637	2.501	2.214
270	5.198	5.541	4.998	4.197	3.621	3.080	2.738	2.480	2.367	2.099
260	5.798	5.768	4.969	4.126	3.772	3.487	3.236	2.996	2.886	2.574
250	7.261	6.637	5.859	5.694	5.362	5.077	4.785	4.504	4.339	3.957
240	6.983	6.965	5.969	5.422	4.801	4.348	3.832	3.414	3.288	2.943
230	6.741	6.359	5.490	4.616	4.009	3.581	3.249	2.958	2.835	2.530
220	10.556	11.191	9.169	8.172	7.310	6.608	6.070	5.589	5.375	4.786
210	8.253	6.887	5.286	4.357	3.781	3.241	2.891	2.600	2.475	2.148
200	7.331	6.550	5.383	4.668	3.878	3.298	2.907	2.595	2.466	2.134
190	11.884	10.139	7.747	6.179	5.166	4.426	3.923	3.518	3.348	2.909
180	8.298	7.222	5.814	4.904	4.206	3.656	3.265	2.938	2.799	2.432
170	8.117	6.935	5.296	4.326	3.677	3.203	2.868	2.590	2.472	2.162
160	6.437	5.425	4.168	3.402	2.914	2.516	2.231	1.993	1.892	1.644
150	10.981	8.796	6.539	5.238	4.370	3.738	3.310	2.965	2.821	2.447
140	8.134	7.546	6.211	5.212	4.400	3.759	3.315	2.952	2.800	2.406
130	7.465	6.260	5.452	4.584	3.848	3.389	3.008	2.696	2.564	2.288
120	6.670	5.501	4.570	3.992	3.511	3.157	2.890	2.661	2.564	2.281
110	3.049	3.441	3.156	2.704	2.399	2.164	1.977	1.809	1.735	1.524
100	1.628	2.965	2.941	2.798	2.603	2.253	2.124	2.003	1.945	1.759
90	1.297	2.618	2.756	2.345	2.092	2.022	1.958	1.769	1.682	1.455
80	1.111	2.333	2.251	2.014	1.701	1.489	1.384	1.283	1.215	1.049
70	1.395	2.343	2.480	2.031	1.725	1.593	1.505	1.515	1.509	1.466
60	1.163	2.084	2.186	1.897	1.578	1.527	1.291	1.113	1.061	0.967
50	1.074	2.133	2.318	1.960	1.815	1.770	1.519	1.308	1.220	1.034
40	1.057	1.681	1.673	1.599	1.392	1.238	1.176	1.150	1.139	1.086
30	0.835	1.803	1.736	1.621	1.465	1.473	1.521	1.523	1.502	1.338
20	0.788	1.893	1.848	1.509	1.489	1.571	1.532	1.468	1.432	1.316
10	0.733	1.489	1.440	1.482	1.396	1.480	1.367	1.257	1.222	1.132
Maximums (All: 11.88)	11.884	11.191	9.169	8.172	7.310	6.608	6.070	5.589	5.375	4.786

Table A.3 Years 1982-1986 2nd High 24 hr Concentration, Run AWN

Wake Affect Used:
Huber-Snyder
MPW in all Directions

Parameters

Temperature	105	deg F
Stack Diameter	4.54	ft
ACFM	58000	acfm
Stack Area	16.19	sq ft
Stack Velocity	59.7	fps
Emission	9.94	lb/hr
Stack Height	145	ft
Building Height	139	ft
Width (N-S)	33	ft
Length (E-W)	105	ft
Max Proj Width	110	ft
Plant Elevation	0	ft

Concentrations in micrograms/cubic meter

	Deg/ M:	250	406	562	717	873	1029	1165	1300	1365	1564
	360	5.863	5.514	4.300	3.428	2.832	2.356	1.987	1.697	1.594	1.362
	350	7.448	5.847	4.182	3.391	2.858	2.474	2.231	2.035	1.952	1.737
	340	6.423	4.826	3.573	2.865	2.389	2.047	1.819	1.637	1.561	1.366
	330	6.102	5.122	3.877	3.169	2.706	2.359	2.129	1.943	1.864	1.659
	320	7.135	5.818	4.402	3.542	2.951	2.522	2.231	1.998	1.901	1.654
	310	8.596	7.148	5.517	4.330	3.564	2.970	2.585	2.284	2.162	1.854
	300	8.903	6.923	5.357	4.308	3.604	3.123	2.801	2.541	2.432	2.150
	290	7.506	5.657	4.348	3.550	3.003	2.594	2.320	2.082	1.983	1.731
	280	8.947	7.681	5.763	4.663	3.884	3.286	2.894	2.584	2.456	2.132
	270	9.177	7.258	5.296	4.229	3.535	2.989	2.611	2.305	2.178	1.905
	260	8.925	7.577	5.712	4.628	3.855	3.289	2.914	2.614	2.489	2.168
	250	12.734	10.426	7.707	6.272	5.301	4.580	4.105	3.721	3.560	3.143
	240	10.676	8.689	6.525	5.243	4.437	3.847	3.445	3.089	2.928	2.517
	230	9.902	7.341	5.602	4.495	3.732	3.182	2.819	2.532	2.414	2.112
	220	11.509	8.616	6.522	5.291	4.459	3.846	3.438	3.108	2.970	2.610
	210	6.994	5.410	3.835	3.370	2.831	2.435	2.165	1.947	1.856	1.620
	200	6.196	5.245	3.702	2.933	2.465	2.108	1.876	1.689	1.611	1.411
	190	8.041	7.143	5.186	4.078	3.432	2.961	2.648	2.395	2.289	2.014
	180	6.695	5.631	4.307	3.516	2.975	2.579	2.309	2.089	1.997	1.755
	170	6.367	5.176	3.914	3.190	2.683	2.308	2.055	1.850	1.764	1.543
	160	5.102	4.120	3.105	2.505	2.099	1.804	1.605	1.444	1.377	1.202
	150	8.861	6.733	4.845	3.826	3.182	2.720	2.415	2.171	2.069	1.806
	140	8.035	6.354	4.740	3.799	3.214	2.784	2.486	2.219	2.109	1.823
	130	7.994	6.298	4.875	3.895	3.200	2.695	2.359	2.094	1.985	1.708
	120	8.768	6.827	4.959	3.941	3.275	2.795	2.478	2.227	2.122	1.855
	110	6.767	6.236	4.829	3.857	3.170	2.660	2.330	2.071	1.964	1.694
	100	7.738	5.850	4.367	3.455	2.846	2.417	2.134	1.907	1.814	1.573
	90	8.505	6.521	5.073	4.020	3.304	2.789	2.445	2.171	2.052	1.730
	80	6.088	4.744	3.766	2.914	2.411	2.025	1.813	1.642	1.571	1.384
	70	7.902	6.231	4.427	3.509	2.999	2.612	2.344	2.123	2.030	1.786
	60	7.405	5.795	4.243	3.384	2.816	2.405	2.136	1.922	1.833	1.605
	50	8.116	6.336	4.589	3.649	3.000	2.530	2.220	1.975	1.874	1.619
	40	5.656	4.723	3.595	2.822	2.285	1.944	1.738	1.571	1.501	1.318
	30	6.841	5.555	4.159	3.382	2.804	2.409	2.143	1.928	1.838	1.604
	20	6.385	5.667	4.306	3.509	2.959	2.548	2.278	2.058	1.960	1.710
All	10	6.289	4.754	3.442	2.750	2.304	1.977	1.760	1.586	1.514	1.326
Maximums 12.73		12.734	10.426	7.707	6.272	5.301	4.580	4.105	3.721	3.560	3.143

Table A.4 Years 1982-1986 2nd High 24 hr Concentration, Run AWO

Concentrations in micrograms/cubic meter

			Deg/ M:	1000	1500	2000	3000	4000	5000	6000	8000	10000	12000
Wake Affect Used:													
Schulman-Scire			360	10.459	6.058	4.863	3.308	2.411	1.850	1.476	1.018	0.759	0.596
MPW in all Directions			350	12.229	8.437	6.321	4.099	2.949	2.259	1.805	1.254	0.980	0.814
			340	10.647	7.220	5.389	3.475	2.493	1.908	1.524	1.063	0.798	0.658
Parameters			330	13.094	9.219	7.007	4.617	3.367	2.610	2.107	1.490	1.137	0.910
Temperature	105	deg F	320	12.373	8.536	6.417	4.237	3.088	2.398	1.940	1.389	1.057	0.844
Stack Diameter	4.54	ft	310	14.393	9.352	6.829	4.378	3.222	2.590	2.201	1.588	1.230	1.013
ACFM	58000	acfm	300	16.063	11.315	8.467	5.479	4.010	3.159	2.595	1.865	1.433	1.151
Stack Area	16.19	sq ft	290	12.945	8.970	6.914	5.033	3.927	3.221	2.718	2.018	1.590	1.312
Stack Velocity	59.7	fps	280	16.274	10.987	8.319	5.465	3.979	3.080	2.481	1.744	1.350	1.096
Emission	34.00	lb/hr	270	14.641	10.173	7.707	4.816	3.471	2.849	2.412	1.719	1.303	1.042
Stack Height	145	ft	260	16.364	10.919	8.016	5.076	3.607	2.858	2.377	1.762	1.402	1.170
Building Height	139	ft	250	23.958	16.598	12.418	7.972	5.683	4.319	3.427	2.354	1.759	1.444
Width (N-S)	33	ft	240	18.700	12.375	9.165	5.874	4.155	3.248	2.732	2.011	1.545	1.264
Length (E-W)	105	ft	230	16.895	11.474	8.716	5.908	4.456	3.445	2.745	2.083	1.669	1.398
Max Proj Width	110	ft	220	24.319	17.376	13.083	8.371	5.952	4.527	3.606	2.473	1.837	1.434
Plant Elevation	0	ft	210	11.477	7.686	5.565	3.399	2.365	1.848	1.505	1.082	0.854	0.680
			200	11.607	7.631	5.586	3.554	2.552	1.962	1.577	1.112	0.851	0.680
			190	15.572	10.394	7.636	4.903	3.706	2.967	2.464	1.824	1.438	1.186
			180	12.954	8.692	6.455	4.544	3.463	2.761	2.273	1.646	1.275	1.025
			170	11.268	7.724	5.726	3.632	2.583	1.967	1.569	1.146	0.903	0.742
			160	8.839	5.871	4.334	2.875	2.213	1.809	1.527	1.156	0.922	0.763
			150	13.205	8.748	6.390	4.014	2.876	2.124	1.786	1.367	1.104	0.921
			140	13.401	8.630	6.129	3.688	2.784	2.105	1.709	1.228	0.980	0.818
			130	13.110	9.188	7.096	4.852	3.646	2.898	2.388	1.802	1.419	1.162
			120	13.910	9.412	7.038	4.501	3.240	2.505	2.026	1.507	1.190	0.964
			110	12.403	8.262	6.149	3.976	2.877	2.224	1.808	1.352	1.069	0.875
			100	11.347	7.417	5.359	3.323	2.320	1.738	1.365	0.973	0.744	0.590
			90	12.583	8.229	5.796	3.651	2.633	2.041	1.654	1.167	0.927	0.773
			80	9.562	6.926	5.329	3.513	2.535	1.943	1.551	1.074	0.804	0.646
			70	12.324	8.072	5.901	3.779	2.684	2.040	1.655	1.242	0.989	0.816
			60	12.210	8.083	5.879	3.656	2.778	2.145	1.704	1.170	0.871	0.683
			50	12.988	8.606	6.435	4.290	3.203	2.648	2.255	1.734	1.400	1.173
			40	9.194	6.505	5.021	3.406	2.556	2.047	1.739	1.334	1.076	0.902
			30	11.243	8.113	6.115	3.886	2.730	2.046	1.605	1.182	0.946	0.793
			20	12.243	8.411	6.309	4.074	2.913	2.226	1.775	1.233	0.930	0.737
		All	10	9.346	6.347	4.702	2.987	2.167	1.682	1.361	0.965	0.737	0.580
Maximums		24.32		24.319	17.376	13.083	8.371	5.952	4.527	3.606	2.473	1.837	1.444

Table A.5 Years 1982-1986 2nd High 24 hr Concentration, Run AWP

Wake Affect Used:
Schulman-Scire
MPW in all Directions

Parameters

Parameter	Value	Unit
Temperature	105	deg F
Stack Diameter	4.54	ft
ACFM	58000	acfm
Stack Area	16.19	sq ft
Stack Velocity	59.7	fps
Emission	85.01	lb/hr
Stack Height	145	ft
Building Height	139	ft
Width (N-S)	33	ft
Length (E-W)	105	ft
Max Proj Width	110	ft
Plant Elevation	0	ft

Concentrations in micrograms/cubic meter

Deg/ M:	1000	1500	2000	3000	4000	5000	6000	8000	10000	12000
360	26.151	15.146	12.159	8.271	6.027	4.626	3.690	2.546	1.899	1.489
350	30.576	21.096	15.804	10.248	7.374	5.648	4.514	3.136	2.450	2.036
340	26.620	18.053	13.473	8.689	6.234	4.770	3.810	2.657	1.996	1.644
330	32.739	23.051	17.521	11.543	8.419	6.526	5.269	3.725	2.842	2.275
320	30.935	21.342	16.044	10.593	7.721	5.996	4.852	3.472	2.643	2.110
310	35.986	23.384	17.074	10.947	8.055	6.477	5.504	3.971	3.075	2.533
300	40.162	28.292	21.171	13.699	10.026	7.899	6.489	4.663	3.583	2.878
290	32.366	22.429	17.287	12.584	9.818	8.053	6.797	5.046	3.976	3.281
280	40.690	27.470	20.801	13.665	9.948	7.700	6.204	4.361	3.374	2.740
270	36.607	25.436	19.269	12.040	8.678	7.124	6.031	4.298	3.259	2.604
260	40.915	27.300	20.043	12.693	9.019	7.145	5.943	4.406	3.506	2.926
250	59.903	41.501	31.049	19.933	14.210	10.798	8.569	5.885	4.397	3.610
240	46.755	30.941	22.915	14.686	10.389	8.122	6.830	5.029	3.863	3.161
230	42.241	28.688	21.793	14.771	11.143	8.615	6.863	5.208	4.173	3.494
220	60.806	43.446	32.711	20.929	14.881	11.320	9.017	6.182	4.594	3.585
210	28.697	19.218	13.915	8.498	5.913	4.621	3.763	2.706	2.136	1.699
200	29.022	19.081	13.968	8.886	6.382	4.906	3.944	2.779	2.128	1.701
190	38.934	25.988	19.093	12.260	9.267	7.419	6.162	4.561	3.595	2.965
180	32.389	21.733	16.138	11.360	8.659	6.904	5.684	4.115	3.188	2.564
170	28.173	19.312	14.316	9.082	6.457	4.919	3.924	2.864	2.258	1.856
160	22.101	14.679	10.837	7.188	5.532	4.524	3.819	2.891	2.305	1.908
150	33.016	21.873	15.978	10.036	7.191	5.310	4.464	3.418	2.762	2.303
140	33.505	21.577	15.324	9.220	6.960	5.263	4.273	3.071	2.451	2.045
130	32.780	22.973	17.742	12.133	9.117	7.246	5.970	4.505	3.547	2.905
120	34.779	23.533	17.598	11.255	8.100	6.264	5.066	3.769	2.977	2.410
110	31.012	20.657	15.374	9.942	7.194	5.562	4.520	3.381	2.673	2.189
100	28.370	18.545	13.398	8.308	5.799	4.346	3.414	2.433	1.859	1.475
90	31.461	20.575	14.493	9.130	6.582	5.103	4.135	2.917	2.317	1.933
80	23.908	17.316	13.324	8.782	6.337	4.858	3.879	2.685	2.011	1.615
70	30.813	20.182	14.755	9.450	6.711	5.100	4.138	3.105	2.472	2.040
60	30.529	20.211	14.700	9.141	6.945	5.362	4.260	2.926	2.178	1.708
50	32.474	21.519	16.089	10.726	8.007	6.620	5.639	4.334	3.501	2.934
40	22.987	16.264	12.555	8.515	6.390	5.117	4.348	3.335	2.691	2.254
30	28.111	20.284	15.289	9.716	6.826	5.117	4.012	2.955	2.366	1.982
20	30.611	21.029	15.773	10.187	7.284	5.565	4.439	3.082	2.325	1.844
10	23.368	15.870	11.757	7.469	5.417	4.207	3.403	2.413	1.843	1.450
Maximums (All: 60.81)	60.806	43.446	32.711	20.929	14.881	11.320	9.017	6.182	4.594	3.610

APPENDIX B VISIBILITY ANALYSIS RESULTS

Table B.1 Viscreen Visual Impact Analysis Input Data

VISCREEN VISUAL IMPACT ANALYSIS RESULTS

SOURCE: AFI

RECEPTOR: CHASSAHOWITZKA NWR

INPUT EMISSION RATES FOR:

PARTICULATES	9.940	MASS UNIT	4
NOX (AS NO2)	0.000	TIME UNIT	3
PRIMARY NO2	0.000		
SOOT	0.000	MASS: 1=GM;2=KG;3=MT;4=LB;5=TON	
PRIMARY SO4	0.000	TIME: 1=SEC;2=MIN;3=HR;4=DAY;5=YR	

SOURCE OBSERVER DISTANCE (KM):	103.000
MIN. SOURCE-CLASS I DISTANCE (KM):	103.000
MAX. SOURCE-CLASS I DISTANCE (KM):	117.000
BACKGROUND VISUAL RANGE (KM):	25.000

PARTICLE CHARACTERISTICS:

	DENSITY (GM/CM3)	SIZE CLASS	CLASS 1= 0.1 um
			2= 0.2
			3= 0.3
BACKGR'D FINE	1.500	3	4= 0.5
BACKGR'D COARSE	2.500	8	5= 1.0
PLUME PARTICLES	2.500	6	6= 2.0
SOOT	2.000	1	7= 5.0
PRIMARY SO4	1.500	4	8= 6.0
			9=10.0

OZONE CONC. (PPM):	0.040	
WIND SPEED (M/S):	1.000	
STABILITY CLASS:	6	1=A;2=B;3=C;4=D;5=E;6=F
PLUME OFFSET ANGLE:	11.250	

Table B.2 Viscreen Visual Impact Analysis Delta E Results

DELTA E RESULTS

DELTA E RESULTS

LINE OF SIGHT	OUT/ IN	PHI	ALPHA	X	RP	RO	PSI	CONTRAST THRESHLD	DELTA E THRESHLD	DELTA E PL/SKY FORW'D	DELTA E THRESHLD	DELTA E PL/SKY BACK	DELTA E THRESHLD	DELTA E PL/TER FORW'D	DELTA E THRESHLD	DELTA E PL/TER BACK
32	0	0.1	168.6	1.0	102.0	102.5	0.03	0.18	10.73	0.00	3.25	0.00	10.73	0.00	3.25	0.00
1	0	5.0	163.8	32.1	71.8	85.4	0.24	0.05	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
2	0	10.0	158.8	49.3	55.4	73.4	0.35	0.05	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
3	0	15.0	153.8	60.3	45.4	64.7	0.45	0.05	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
4	0	20.0	148.8	67.9	38.7	58.3	0.54	0.05	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
5	0	25.0	143.8	73.6	34.0	53.5	0.63	0.05	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
6	0	30.0	138.8	78.1	30.5	49.7	0.71	0.05	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
7	0	35.0	133.8	81.8	27.8	46.7	0.79	0.05	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
8	0	40.0	128.8	84.9	25.8	44.4	0.86	0.05	2.00	0.01	2.00	0.00	2.00	0.00	2.00	0.00
9	0	45.0	123.8	87.6	24.2	42.7	0.92	0.05	2.00	0.01	2.00	0.00	2.00	0.00	2.00	0.00
10	0	50.0	118.8	90.0	22.9	41.3	0.97	0.05	2.00	0.01	2.00	0.00	2.00	0.00	2.00	0.00
11	0	55.0	113.8	92.2	22.0	40.4	1.02	0.05	2.00	0.01	2.00	0.00	2.00	0.00	2.00	0.00
12	0	60.0	108.8	94.2	21.2	39.8	1.06	0.05	2.00	0.01	2.00	0.00	2.00	0.00	2.00	0.00
13	0	65.0	103.8	96.1	20.7	39.5	1.09	0.05	2.00	0.01	2.00	0.00	2.00	0.00	2.00	0.00
14	0	70.0	98.8	97.9	20.3	39.5	1.12	0.05	2.00	0.01	2.00	0.00	2.00	0.00	2.00	0.00
15	0	75.0	93.8	99.7	20.1	39.8	1.13	0.05	2.00	0.01	2.00	0.00	2.00	0.00	2.00	0.00
16	0	80.0	88.8	101.5	20.1	40.4	1.14	0.05	2.00	0.01	2.00	0.00	2.00	0.00	2.00	0.00
33	1	84.4	84.4	103.0	20.2	41.2	1.13	0.05	2.00	0.01	2.00	0.00	2.00	0.00	2.00	0.00
17	1	85.0	83.8	103.2	20.2	41.3	1.13	0.05	2.00	0.01	2.00	0.00	2.00	0.00	2.00	0.00
18	1	90.0	78.8	105.0	20.5	42.7	1.12	0.05	2.00	0.01	2.00	0.00	2.00	0.00	2.00	0.00
19	1	95.0	73.8	106.9	20.9	44.4	1.10	0.05	2.00	0.01	2.00	0.00	2.00	0.00	2.00	0.00
20	1	100.0	68.8	108.8	21.6	46.7	1.07	0.05	2.00	0.01	2.00	0.00	2.00	0.00	2.00	0.00
21	1	105.0	63.8	110.9	22.4	49.7	1.04	0.05	2.00	0.01	2.00	0.00	2.00	0.00	2.00	0.00
22	1	110.0	58.8	113.2	23.5	53.5	0.99	0.05	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
23	1	115.0	53.8	115.8	24.9	58.3	0.94	0.05	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
34	1	117.2	51.5	117.0	25.7	61.0	0.91	0.05	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
24	0	120.0	48.8	118.6	26.7	64.7	0.88	0.05	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
25	0	125.0	43.8	122.0	29.1	73.4	0.81	0.05	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
26	0	130.0	38.8	126.1	32.1	85.4	0.74	0.05	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
27	0	135.0	33.8	131.1	36.2	103.0	0.66	0.05	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
28	0	140.0	28.8	137.6	41.8	131.1	0.58	0.05	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
29	0	145.0	23.8	146.7	49.9	182.1	0.49	0.05	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
30	0	150.0	18.8	160.2	62.5	302.0	0.39	0.05	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
31	0	155.0	13.8	183.1	84.5	903.6	0.30	0.05	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00

Table B.3 Viscreen Visual Impact Analysis Contrast Results

CONTRAST RESULTS — CONTRAST RESULTS

LINE OF SIGHT	OUT/ IN	PHI	CONTRAST THRESHLD	GREEN CONTRAST PL/SKY FORW'D	GREEN DELTA C SKY/TER FORW'D	GREEN CONTRAST PL/SKY BACK	GREEN DELTA C SKY/TER BACK	BLUE CONTRAST PL/SKY FORW'D	BLUE DELTA C SKY/TER FORW'D	BLUE CONTRAST PL/SKY BACK	BLUE DELTA C SKY/TER BACK	RED CONTRAST PL/SKY FORW'D	RED DELTA C SKY/TER FORW'D	RED CONTRAST PL/SKY BACK	RED DELTA C SKY/TER BACK	BLUE-RED RATIO PL/SKY FORW'D	BLUE-RED RATIO PL/SKY BACK
32	0	0.1	0.180	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	1.000
1	0	5.0	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	1.000
2	0	10.0	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	1.000
3	0	15.0	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	1.000
4	0	20.0	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	1.000
5	0	25.0	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	1.000
6	0	30.0	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	1.000
7	0	35.0	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	1.000
8	0	40.0	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	1.000
9	0	45.0	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	1.000
10	0	50.0	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	1.000
11	0	55.0	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	1.000
12	0	60.0	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	1.000
13	0	65.0	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	1.000
14	0	70.0	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	1.000
15	0	75.0	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	1.000
16	0	80.0	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	1.000
33	1	84.4	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	1.000
17	1	85.0	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	1.000
18	1	90.0	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	1.000
19	1	95.0	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	1.000
20	1	100.0	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	1.000
21	1	105.0	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	1.000
22	1	110.0	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	1.000
23	1	115.0	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	1.000
34	1	117.2	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	1.000
24	0	120.0	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	1.000
25	0	125.0	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	1.000
26	0	130.0	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	1.000
27	0	135.0	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	1.000
28	0	140.0	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	1.000
29	0	145.0	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	1.000
30	0	150.0	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	1.000
31	0	155.0	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	1.000

FIGURE B.1

PLUME PERCEPTIBILITY VS. AZIMUTH

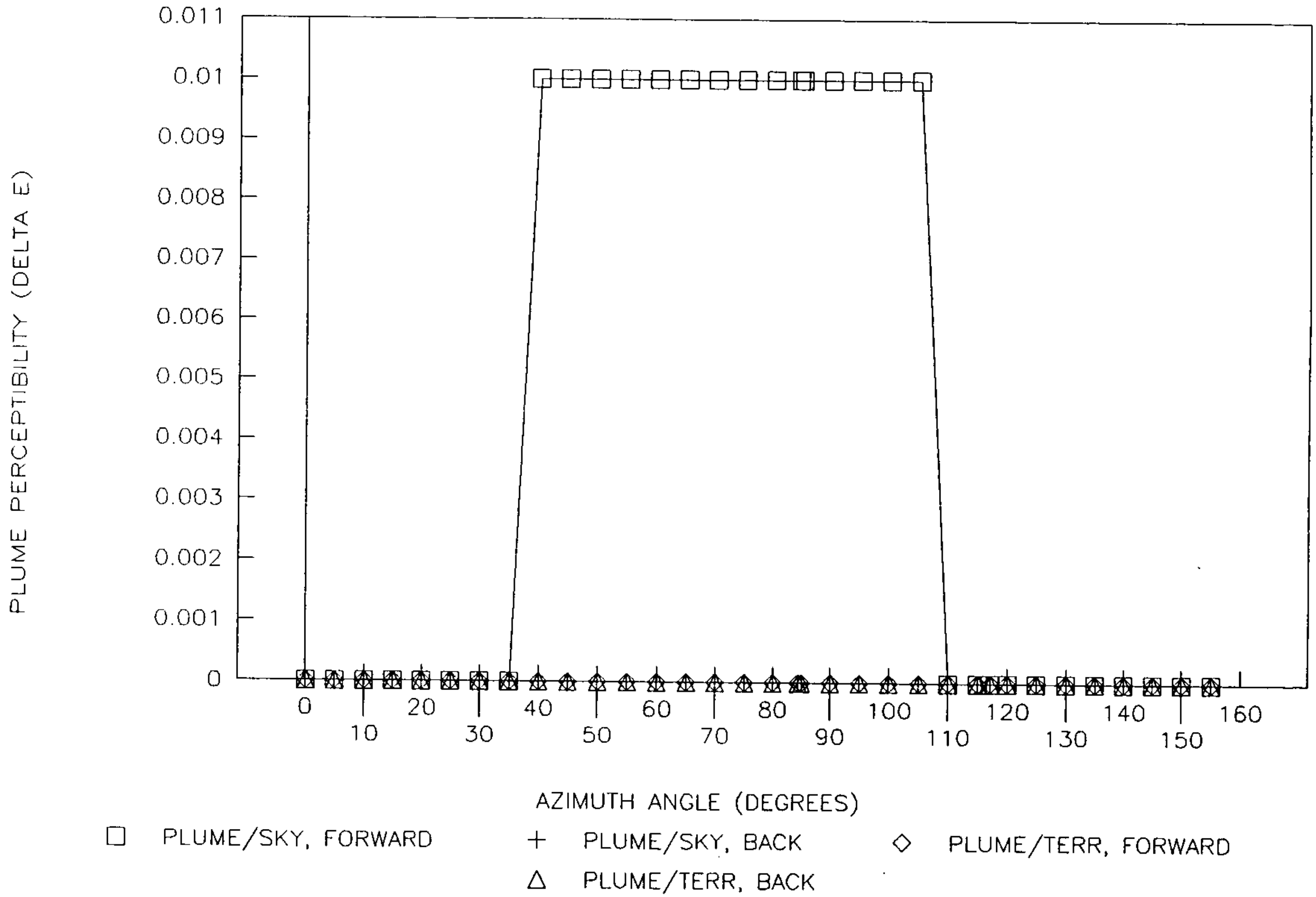


FIGURE B.2

GREEN CONTRAST VS. AZIMUTH

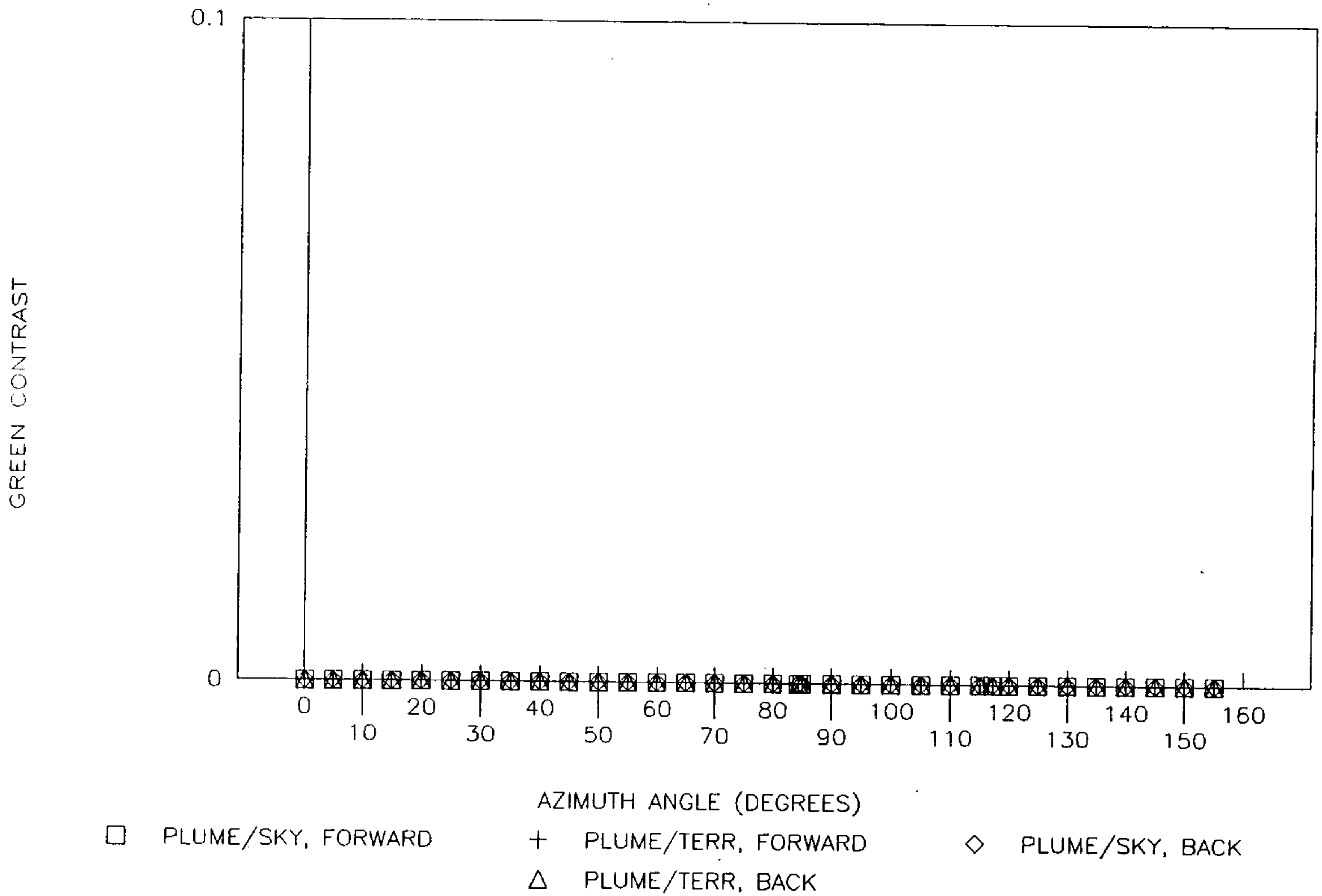


FIGURE B.3

BLUE-RED RATIO VS. AZIMUTH