GARDINIER INC.

8813 Hwy 41 South o Riverview, Florida 33569 o Telephone 813 — 677-9111 o TWX 810 — 876-0648 o Telex 52666 o FAX-813-671-6146

March 19, 1990

Mr. Clair Fancy
Central Air Permitting
Department Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 323-00-2400

Subject: Construction Permit Application
Modifications To Permits
AO29-152717, AO29-152718, AO29-152266

Dear Sir:

Enclosed are four (4) copies of three (3) construction permit applications for the increase of production rates of the Gardinier No. 3 Ammonium Phosphate Granulator, No. 4 Ammonium Phosphate Granulator and the South Ammonium Phosphate Cooler. Also enclosed is the permit fee check in the amount of $3,500.

The subject units are interrelated and located in the same building. Gardinier also requests the subject units be re-permitted in a single operation permit.

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

Very truly yours,

E. O. Morris
Environmental Manager

:gf

cc: Jerry Campbell/$365.00/EPC
Bill Thomas/DER/TPA
P-8, 9, 10

1031

GARDINIER INC.

Post Office Box 3269 • Tampa, Florida 33601 • Telephone 813 - 677 - 9111 • TWX 810 - 876 - 0648 • Telex - 52666 • Cable - Gardinphos

I hereby certify that I am Secretary of Gardinier, Inc., a Delaware corporation; that as such Secretary I have custody of certain of the books and records of said corporation, including the minutes of meetings of the Board of Directors and Stockholders thereof; that the following is a true and correct copy of an excerpt of a resolution adopted by said Board of Directors on February 22, 1990, which resolution is still in full force and effect.

"WHEREAS, Pursuant to SECTION 3 of ARTICLE IV of the By-laws of the Company, the President is primarily responsible for the execution of corporate documents; and

"WHEREAS, In the judgment of the Board, it is deemed advisable to delegate some of the responsibility for executing and submitting various documents to certain other individuals of the Company;

"NOW THEREFORE, BE IT RESOLVED, That the Environmental Manager and the Mine Manager are hereby authorized, for and on behalf of the Company, to execute and submit all routine environmental reports, permit applications and follow-up responses, where signature of an officer is not otherwise mandated by law, statute or regulation..."

I further certify that as of this date, the following noted individuals currently hold the titles set opposite their names:

Edgar Oswald Morris	Environmental Manager
John R. Schmedeman	Mine Manager

WITNESS MY HAND AND THE SEAL of Gardinier, Inc., this 6th day of March, 19 90.

Secretary

NO. 577050691

GARDINIER, INC.

BOX 3269, TAMPA, FLORIDA 33601

VENDOR NUMBER	INVOICE NUMBER	INVOICE DATE	GROSS AMOUNT	DISCOUNT	NET AMOUNT
45085		3 13 90	36500		36500

#3 Ammonia Phosphate Gran. Const. Permit (P-10)
#4 Ammonia Phosphate Gran. Const. Permit (P-9)
South Ammonia Cooler (P-8)

TOTAL	36500		36500

IF CORRECT, DETACH AND RETAIN STATEMENT. IF NOT CORRECT, RETURN WITH STATEMENT.

GARDINIER, INC. TAMPA, FLORIDA

NO. 577050691

64-1278
611

DATE MO.	DAY	YR.	PAY EXACTLY	DOLLARS AND	CENTS	DOLLARS	CENTS
3	14	90	********365	00		$********365	00

TO THE ORDER OF
HILLSBOROUGH COUNTY ENVIRON-
MENTAL PROTECTION COMMISSION
1900 9TH AVENUE
TAMPA FL 33605

GARDINIER, INC.

AUTHORIZED SIGNATURE

THE CITIZENS AND SOUTHERN NATIONAL BANK
Atlanta, DeKalb County, Georgia

⑈577050691⑈ ⑆061112788⑆ 011 07 093⑈

GARDINIER, INC. TAMPA, FLORIDA

NO. 577050601

64-1278
611

DATE MO.	DAY	YR.
3/14/90		

PAY EXACTLY ******3,500 DOLLARS AND 00 CENTS

DOLLARS	CENTS
$******3,500	00

20

TO THE ORDER OF
STATE OF FLORIDA DEPARTMENT OF
ENVIRONMENTAL REGULATION
4520 OAK FAIR BOULEVARD
TAMPA FL 33610

GARDINIER, INC.

AUTHORIZED SIGNATURE

THE CITIZENS AND SOUTHERN NATIONAL BANK
Atlanta, DeKalb County, Georgia

[redacted]

2600 Blair Stone Road
Tallahassee, FL 323-00-2400

Subject: Construction Permit Application
Modifications To Permits
AO29-152717, AO29-152718, AO29-152266

Dear Sir:

Enclosed are four (4) copies of three (3) construction permit applications for the increase of production rates of the Gardinier No. 3 Ammonium Phosphate Granulator, No. 4 Ammonium Phosphate Granulator and the South Ammonium Phosphate Cooler. Also enclosed is the permit fee check in the amount of $3,500.

The subject units are interrelated and located in the same building. Gardinier also requests the subject units be re-permitted in a single operation permit.

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

Very truly yours,

[redacted]

$500 pd.
3-21-90
Recpt. #151109

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

RECEIVED

MAR 21 1990

DER BAQM

AC 29-177929

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: #3 Ammonium Phosphate Granulator [ ] New[1] [x] Existing[1]

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

COMPANY NAME: Gardinier, Inc. COUNTY: Hillsborough

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) #3 Process Scrubber

SOURCE LOCATION: Street 8813 Hwy 41 South City Riverview

UTM: East 17-362.6 North 3082.4

Latitude 27 ° 51 ' 28 "N Longitude 82 ° 23 ' 15 "W

APPLICANT NAME AND TITLE: Ozzie Morris, Environmental Manager

APPLICANT ADDRESS: 8813 Hwy 41 South, Riverview, FL 33569

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Gardinier, 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: E. O. Morris

Ozzie Morris, Environmental Manager
Name and Title (Please Type)

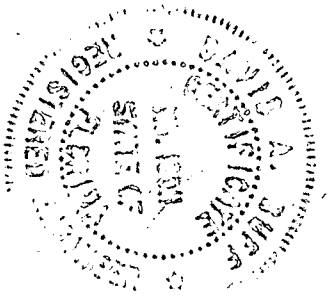
Date: 3/9/90 Telephone No. (813) 677-9111

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

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

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

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 David A. Buff

David A. Buff
Name (Please Type)

KBN Engineering and Applied Sciences, Inc.
Company Name (Please Type)

1034 N.W. 57th St., Gainesville, FL 32605
Mailing Address (Please Type)

Florida Registration No. 19011 Date: 3/6/90 Telephone No. (904) 331-9000

SECTION II: GENERAL PROJECT INFORMATION

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

See Attachment A

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

Start of Construction upon permit issuance Completion of Construction 18 mo. after permit issuance

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.)

Conversion to acid scrubbing: $160,000

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

Permit A029-152717 Issued 9/28/89 Expires 6/8/94

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) Not applicable

1. Is this source in a non-attainment area for a particular pollutant? _____

   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. _____

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

4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? _____

5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? _____

H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source? Yes

   a. If yes, for what pollutants? Particulates

   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		
Phosphoric acid	N/A	N/A	49,000	1
Ammonia	N/A	N/A	6,200	2

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

1. Total Process Input Rate (lbs/hr): 55,200

2. Product Weight (lbs/hr): 50,000

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/hr	T/yr	
Particulate	5.7	24.97	Based on current allowable*		5.7	24.97	3
Fluoride	1.0	4.38	17-2:600(3)(b) allocation F1		1.0	4.38	3
Ammonia	100	438	Current permit limit		100	438	3
Sulfur Dioxide	0.0011	0.0050	N/A	N/A	0.0011	0.0050	3
Nitrogen oxides	0.19	0.83	N/A	N/A	0.19	0.83	3

[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).

*From F.A.C. Rule 17-2.650(2)(c)5.b.(i) - 0.3 lb/ton

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		

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

1. Total Process Input Rate (lbs/hr): _____

2. Product Weight (lbs/hr): _____

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/hr	T/yr	
Carbon monoxide	0.038	0.17	N/A	N/A	0.038	0.17	3
VOCs	0.010	0.044	N/A	N/A	0.010	0.044	3

[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)
ARCO WM-350-RL and	Particulate	95%	Submicron	Design
Chemco venturi acid	Fluorides	95%	N/A	Design
scrubber (Existing)	Ammonia	95%	N/A	Design

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
Natural Gas	0.0017	0.0019	2.0

*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: 1050 Btu/scf 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 Not applicable Maximum _____

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

Scrubber water is recycled back into process.

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

Stack Height: 90 ft. Stack Diameter: 3.33 ft.

Gas Flow Rate: 35,000 ACFM 26,800 DSCFM Gas Exit Temperature: 140 °F.

Water Vapor Content: 13 % Velocity: 67.0 FPS

SECTION IV: INCINERATOR INFORMATION

Not applicable

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

Description of Waste _____

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

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

Manufacturer _____

Date Constructed _____ Model No. _____

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

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

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

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

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

[ ] Other (specify) _____

Brief description of operating characteristics of control devices: _____

_____

_____

_____

_____

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

_____

_____

_____

_____

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

SECTION V: SUPPLEMENTAL REQUIREMENTS

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.

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

Not applicable

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

Not applicable

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

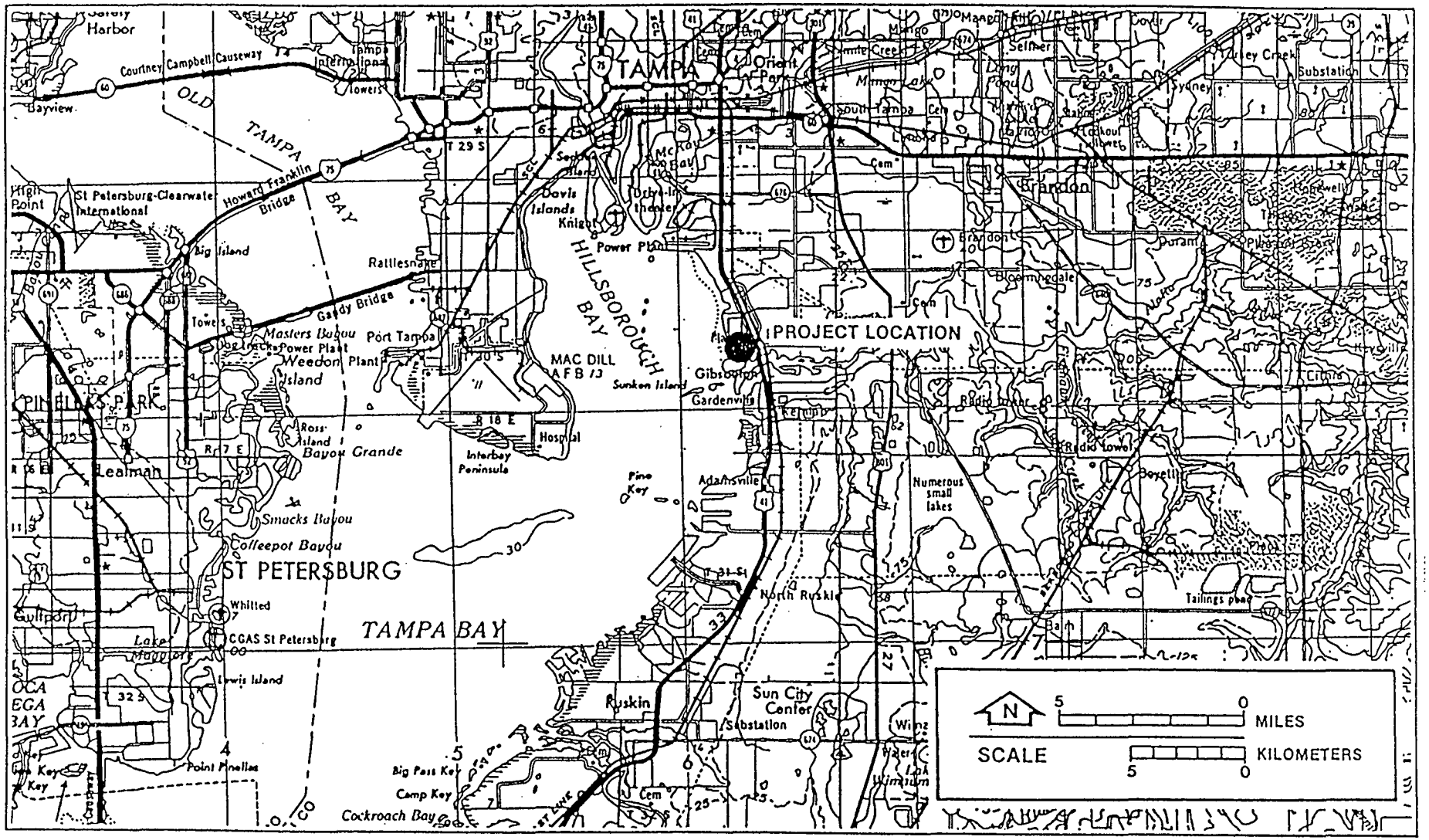
E. Emission Data Used in Modeling

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.

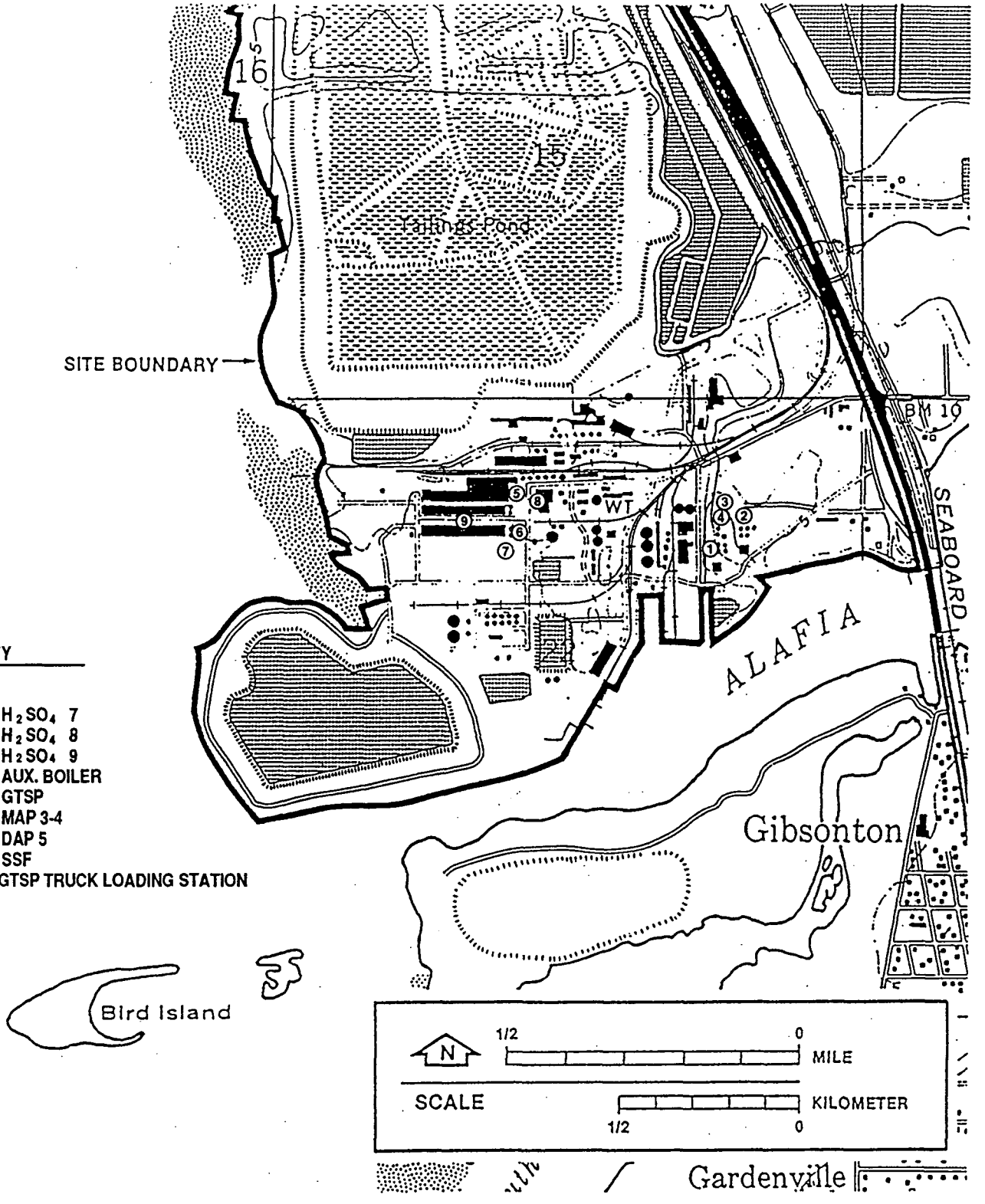
H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.



GENERAL LOCATION MAP OF GARDINIER, INC.

SOURCE: USGS, 1972.

KBN



SITE LOCATION MAP OF GARDINIER, INC.

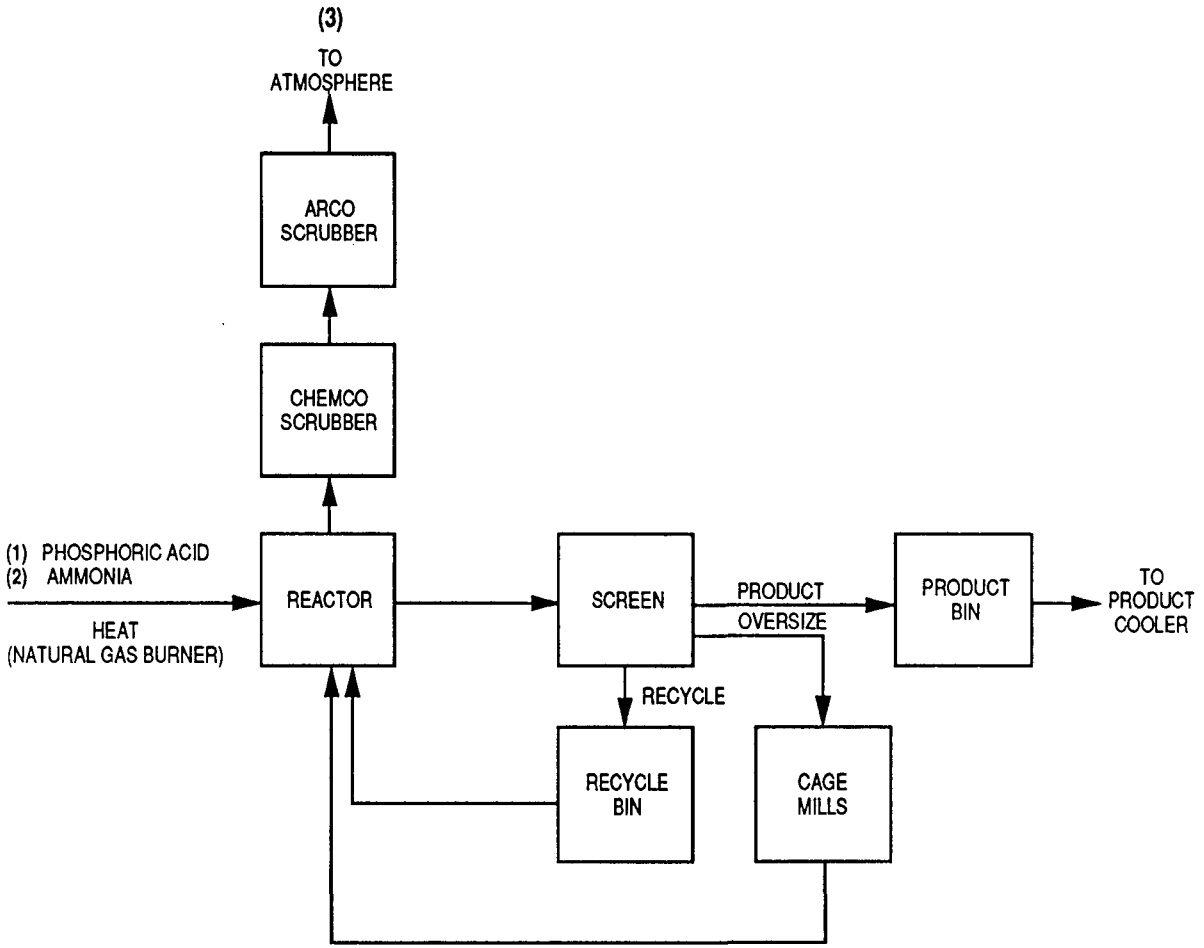
SOURCE: USGS, 1981.

KBN

GARDINIER.1
KBN/10 2/90ph

NO. 3 AMMONIUM PHOSPHATE PLANT

SIMPLIFIED FLOW DIAGRAM



KBN

ATTACHMENT A
NO. 3 AMMONIUM PHOSPHATE PLANT

I. PROJECT DESCRIPTION

Gardinier, Inc., currently operates two ammonium phosphate plants (Nos. 3 and 4) at its existing phosphate fertilizer plant in Riverview, Florida, just south of Tampa. The No. 3 plant is currently permitted for 19 tons per hour of ammonium phosphate. Over the past year and a half, Gardinier has made control improvements in several areas of the plant that have given the plant the capability to run at higher production rates, without increasing actual emissions. The expected production capability of the No. 3 Ammonium Phosphate plant is now 25 tons per hour of ammonium phosphate.

The changes occurred in four areas of the process and are listed below along with the cost associated with the changes:

1.	Recycle control automation	$ 40,000
2.	Ammonia vaporizer stabilization	15,000
3.	Evacuation system retrofit	240,000
4.	Conversion to acid scrubbing on primary scrubber	315,000
	TOTAL	$610,000

The estimated total value of plants No. 3 and No. 4 is approximately $5,000,000. The total value of the changes amounted to about 12 percent of the value of the plants.

Each of the changes that were made had a small impact on the operation, but when added together, the impact on the capabilities of each plant was significant. The changes are described in greater detail below.

1. Recycle Control Automation--The installation of relatively simple controllers and diverter gates in the product stream to automatically control the amount of recycle in the plant has smoothed the operation of the material handling system to a point where it is now operating below its capacity and is steady. Ammonia and phosphoric acid flows are also more steady.

2. Ammonia Vaporizer Stabilization--The ammonia vaporizer is not part of the ammonium phosphate plant. The vaporizer vaporizes liquid ammonia before the ammonia enters the ammonium phosphate reactor vessel. Ammonia is a raw material used in the ammonium phosphate manufacturing process. Changes have been made to the ammonia vaporizer to decrease the heating surface area and to narrow the range of variability in controlling the temperature of the ammonia as it is introduced to the reactor. These modifications have reduced the temperature of the off gases to the scrubber by about 20°F, making them easier to scrub. It has also resulted in a less dusty bed in the reactor, which in turn results in less particulate loading to the evacuation system. The lower temperature has also resulted in slightly less slippage of ammonia from the reaction bed into the scrubbing system.
3. Evacuation System Retrofit--The evacuation system in the No. 3 Ammonium Phosphate plant provides negative pressure to several dust generating points within the plant (i.e., reactor, bucket elevators, mills, screens, etc.). The evacuation system had deteriorated over time, and was in need of major maintenance and repairs. This project was undertaken to completely update and resize the evacuation system ductwork for the plant. The effect of this project was to eliminate the entrance of large amounts of tramp air that entered the evacuation system through oversized ductwork, abandoned trunk lines, and poorly fitting inspection doors. This in-leakage of air limited the effectiveness of the dust handling system by creating a higher than necessary load on the scrubbing system. Elimination of this excess air now enables the dust handling system to remove much more particulate before it reaches the scrubbing system, thus allowing higher production rates while maintaining the same emission rates.
4. Conversion To Acid Scrubbing on Primary Scrubber--The Chemco water scrubbers installed for the plants are used to control ammonia, particulate, and fluoride emissions. This particular project lent further stability and a measure of security to the scrubbing

portion of the plant operation. While this system was effective at controlling ammonia emissions under normal operations, small upsets in the operation of the plant could lead to higher than desired ammonia emissions if not caught immediately as they were happening. Attempts had been made previously to convert the system to acid scrubbing in the primary scrubber since acid has much greater capacity than water to absorb ammonia. Earlier problems with high opacity and lower than desired recirculation rates were finally overcome and the system is operating and is able to not only capture much more of the ammonia than before even at higher rates, but in the process has also become more effective in controlling higher than desired ammonia emissions associated with upsets in the operation. This conversion to acid scrubbing was requested by Hillsborough County EPC.

As a result of the four improvements working in concert, the No.3 Ammonium Phosphate plant is now capable of sustaining higher production rates while meeting the present permitted emission limits. The changes made as listed will allow the plant to meet the current emission limits at rates of up to 25 tons per hour.

The changes made to the No. 3 Ammonium Phosphate plant are considered to be routine repair, replacement, or maintenance of component parts of the plant. Also, the total cost of these changes do not exceed 50 percent of the total cost of a new plant, and therefore these changes should not be viewed as reconstruction. Most importantly, there will be no increase in either actual emissions or in permitted emission levels as a result of these changes. As a result, PSD new source review and New Source Performance Standards should not apply.

II. EMISSION ESTIMATES

A. Particulate Matter (PM)

The current permitted level of PM emissions for the No. 3 Ammonium Phosphate plant is 5.7 pound per hour (lb/hr) and 24.97 tons per year (TPY). This level is based on 0.3 pounds per ton (lb/ton) of ammonium phosphate produced. The new level of allowable emissions is requested to be 0.3 lb/ton or 5.7 lb/hr, whichever is less. Actual PM emissions from the plant are not expected to increase.

B. Fluorides

The current allowable for the plant is 1.0 lb/hr (4.38 TPY) based upon the fluoride allocation for the plant. This level of allowable emission will remain the same, and actual emissions are not expected to increase.

C. Ammonia

The current allowable for the plant is 100 lb/hr (438 TPY). This level of allowable emission and the current level of actual emissions will remain the same.

D. Other Pollutants

Products of combustion are generated from a small natural-gas-fired burner which supplies heat to the process. The burner has a maximum heat input of 2×10^6 British thermal units per hour (Btu/hr), resulting in a maximum natural gas consumption of 1,900 standard cubic feet per hour (scfh). Emissions of sulfur dioxide (SO_2), nitrogen oxides (NO_x), carbon monoxide (CO), and volatile organic compounds (VOCs) are based on AP-42 emission factors:

SO_2: 1,900 scfh x 0.6 lb/10^6 scf = 0.0011 lb/hr

0.0011 lb/hr x 8,760 hr/yr / 2,000 lb/ton = 0.0050 TPY

NO_x: 1,900 scfh x 100 lb/10^6 scf = 0.19 lb/hr

0.19 lb/hr x 8,760 hr/yr / 2,000 lb/ton = 0.83 TPY

CO: 1,900 scfh x 20 lb/10^6 scf = 0.038 lb/hr

0.038 lb/hr x 8,760 hr/yr / 2,000 lb/ton = 0.17 TPY

VOC: 1,900 scfh x 5.3 lb/10^6 scf = 0.010 lb/hr

0.010 lb/hr x 8,760 hr/yr / 2,000 lb/ton = 0.044 TPY

III. CONSTRUCTION/OPERATING PERMITS

Due to the similar nature of the No. 3 and No. 4 Ammonium Phosphate plants and the sharing of a common product cooler, it is requested that a single construction permit and a single operating permit be issued for the No. 3 and No. 4 Ammonium Phosphate plants and cooler. These sources are currently permitted under separate operating permits. This action will reduce the paperwork burden of both FDER and Gardinier, and result in simplification and more efficient handling of permit requirements.

TABLE 1.4-1. UNCONTROLLED EMISSION FACTORS FOR NATURAL GAS COMBUSTION[a]

Furnace size & type (10^6 Btu/hr heat input)	Particulate[b]		Sulfur dioxide[c]		Nitrogen oxides[d]		Carbon monoxide[e]		Volatile organics			
									Nonmethane		Methane	
	$kg/10^6 m^3$	$lb/10^6 ft^3$	$kg/10^6 m^3$	$lb/10^6 ft^3$	$kg/10^6 m^3$	$lb/10^6 ft^3$	$kg/10^6 m^3$	$lb/10^6 ft^3$	$kg/10^6 m^3$	$lb/10^6 ft^3$	$kg/10^6 m^3$	$lb/10^6 ft^3$
Utility boilers (> 100)	16 - 80	1 - 5	9.6	0.6	8800[h]	550[h]	640	40	23	1.4	4.8	0.3
Industrial boilers (10 - 100)	16 - 80	1 - 5	9.6	0.6	2240	140	560	35	44	2.8	48	3
Domestic and commercial boilers (< 10)	16 - 80	1 - 5	9.6	0.6	1600	100	320	20	84	5.3	43	2.7

[a]Expressed as weight/volume fuel fired.
[b]References 15-18.
[c]Reference 4. Based on avg. sulfur content of natural gas, 4600 $g/10^6$ Nm^3 (2000 $gr/10^6$ scf).
[d]References 4-5, 7-8, 11, 14, 18-19, 21.
[e]Expressed as NO_2. Tests indicate about 95 weight % NO_x is NO_2.
[f]References 4, 7-8, 16, 18, 22-25.
[g]References 16, 18. May increase 10 - 100 times with improper operation or maintenance.
[h]For tangentially fired units, use 4400 $kg/10^6$ m^3 (275 $lb/10^6$ ft^3). At reduced loads, multiply factor by load reduction coefficient in Figure 1.4-1. For potential NO_x reductions by combustion modification, see text. Note that NO_x reduction from these modifications will also occur at reduced load conditions.