State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

For Routing To Other Than The Addressee	
To:	Location:
To:	Location:
To:	Location:
From:	Date:

Interoffice Memorandum

Please call Patty Adams when signed 8-1344

TO: Dale Twachtmann

FROM: Steve Smallwood

DATE: August 24, 1990

SUBJ: Modification of Permits
Gardinier, Inc.

Attached for your approval and signature is a letter that will modify the visible emissions standard specified in the BACT determinations and the construction permits for the No. 7 and No. 8 sulfuric acid plants at Gardinier, Inc.'s phosphate fertilizer complex in Hillsborough County, Florida. The revised visible emissions standard of 10% opacity is consistent with county, department, and EPA regulations.

I recommend approval of this modification.

CF/WH/plm

Attachment

RECEIVED
AUG 24 1990
Office of the Secretary

Florida Department of Environmental Regulation

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

Bob Martinez, Governor | Dale Twachtmann, Secretary | John Shearer, Assistant Secretary

August 24, 1990

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. E. O. Morris, Environmental Manager
Gardinier, Inc.
Post Office Box 3269
Tampa, Florida 33601

Dear Mr. Morris:

Re: Modification of BACT Determinations and Construction Permits
Gardinier, Inc., Hillsborough County, Florida.
AC 29-089697, No. 7 Sulfuric Acid Plant
AC 29-089696, No. 8 Sulfuric Acid Plant
AC 29-130371, No. 8 Sulfuric Acid Plant
PSD-FL-026, Nos. 7 and 8 Sulfuric Acid Plants
PSD-FL-118, No. 8 Sulfuric Acid Plant

The Department is in receipt of KBN's August 7, 1990, letter requesting the visible emission standard in the referenced construction permits and BACT determinations for the No. 7 and No. 8 sulfuric acid plants be relaxed from 5% opacity to 10% opacity. As noted in KBN's letter, the 5% opacity standard was based on Chapter 1-3.300V1.C. of the Hillsborough County regulations. The 10% opacity standard requested is consistent with the revised Hillsborough County regulations, the Department's air regulations, and the new source performance standard for sulfuric acid plants (40 CFR 60, Subpart H). This request is acceptable and the referenced construction permits and BACT determinations are modified to allow visible emissions from Gardinier's No. 7 and No. 8 sulfuric acid plants of 10% opacity (6 minute average as determined by Reference Method 9 as described in 40 CFR 60, Appendix A, July 1, 1988).

A copy of this letter must be filed with the referenced construction permits and shall become a part of those permits.

Sincerely,

Dale Twachtmann
Secretary

DT/plm

Attachment: KBN letter dated August 7, 1990

Copies: Bill Thomas, SW District
Jerry Campbell, EPCHC
Jewell Harper, EPA
David Buff, KBN

KBN

RECEIVED
AUG 13 1990
DER-BAQM

August 7, 1990

Mr. Clair Fancy, P.E.
Bureau Chief
Bureau of Air Regulation
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Re: Gardinier, Inc. Hillsborough County
Sulfuric Acid Plants No. 7 and No. 8

Dear Mr. Fancy:

This correspondence is in regards to the No. 7 and No. 8 Sulfuric Acid plants located at Gardinier, Inc., Hillsborough County. It is requested that the visible emissions limitation set forth in the most recent construction permits for these two sources be revised. A discussion of the permitting history of each source and the visible emission (VE) limitations is presented below.

No. 7 Sulfuric Acid Plant

The No. 7 Sulfuric Acid plant received a federal and state PSD permit in 1985 (AC29-089697). This permit authorized the increase in production rate from 1,750 tons per day (TPD) to 2,200 TPD. The VE opacity limitation determined as BACT for the expansion was the Hillsborough County rule contained in Chapter 1-3.30 V1.c. This rule allowed 5% opacity, with the exception that up to 40% opacity was allowed for 30 minute periods during plant startups. It appears that the sole basis for the BACT determination was the Hillsborough County rule. Since the limit was a rule, Gardinier in essence could not challenge the BACT determination at that time. It is noted that the Hillsborough VE regulation was more stringent than Florida's regulation, which limited VE to 10%.

In August 1985, Gardinier received the initial operating permit for the sulfuric acid expansion (AO29-104895). The VE limit in the permit was 5% opacity for any 6-minute consecutive period. This limit was somewhat different than limit stated in the construction permit.

Subsequent to this permit issuance, Hillsborough County rewrote portions of their air quality regulations, and in 1986 revised their VE regulation to conform to the state regulation. The new rule was codified in Chapter 1-3.63(a), and allowed 10% opacity except for a thirty minute period during plant startup, during which time 40% opacity is allowed. This rule is currently in effect in Hillsborough County.

As a result of the change in the Hillsborough County VE rule, in mid-1986 the Hillsborough County Environmental Protection Commission initiated efforts to revise the operating permit to be consistent with the Hillsborough County rule. DER subsequently revised the permit in a letter dated August 22, 1986, which amended Specific Condition 3.c. of the permit to 10% opacity, except that up to 40% is allowed for a thirty minute period during plant startup.

KBN ENGINEERING AND APPLIED SCIENCES, INC.
1034 Northwest 57th Street Gainesville, Florida 32605 904/331-9000 FAX: 904/332-4189

Gardinier was recently issued an operating permit renewal for No. 7 Sulfuric Acid plant. The new permit (AO29-178406), in Specific Condition 5, limits VE to 10% opacity. Specific Condition 8 of the permit contains provisions for excess emissions during times of startup, shutdown or malfunction. In addition, Specific Condition 23 requires that Gardinier apply to FDER's Bureau of Air Regulation in Tallahassee to request an amendment to Specific Condition 4 of the construction permit (AC29-89697) to be consistent with Specific Condition 5 of the operating permit. This condition reflects both Hillsborough County's and FDER Tampa's recognition that the construction permit needs to be amended, and that they believe the proper opacity limit is 10%.

Gardinier is requesting that the original BACT determination for VE of 5% opacity contained in the construction permit AC29-089697 be amended to reflect the 10% opacity limit that has been written into the operating permits for the source since 1986. This is also the current state and Hillsborough County limits for VE. It appears that the sole basis for the original BACT determination was the old Hillsborough County rule, so it is appropriate to revise the BACT based on the revised rule. Hillsborough County and FDER Tampa are in agreement with this request.

No. 8 Sulfuric Acid Plant

The No. 8 Sulfuric Acid plant received a federal and state PSD permit in 1985 (AC29-089696) and again in 1987 (AC29-089696). These permits authorized the increase in production rate from 1,784 TPD to 2,200 TPD and 2,500 TPD, respectively. The VE opacity limitation determined as BACT for the 1985 expansion was the 5% opacity limitation contained in Hillsborough County Rule Chapter 1-3.30 V1.c. This BACT was determined jointly with the No. 7 Sulfuric Acid plant expansion in 1985. Again, it appears that the sole basis for the BACT determination was the Hillsborough County rule.

The BACT for the second plant expansion in 1987 was also 5% VE. FDER again referred to the Hillsborough County rule Chapter 1-3 03 V1 C as the sole justification for the limit. Apparently, the state was following the previous BACT determination for the source, and did not recognize that the Hillsborough County rule had been revised in 1986 to 10% opacity. However, the limit was corrected in the operating permit subsequently issued (AO29-162411) in October 1989. The VE limitation in Specific Condition 2 of this permit quotes the revised Hillsborough County rule of 10% opacity and references the rule citation.

Gardinier is therefore, requesting that the original BACT determination for VE of 5% opacity contained in the construction permit AC29-089696 for No. 8 Sulfuric Acid plant be amended to reflect the 10% opacity limit that has been written into the operating permit for the source. This is also the current state and Hillsborough County limits for VE. It appears that the sole basis for the original BACT determination was the old Hillsborough County rule, so it is appropriate to revise the BACT based on the revised rule.

If this request is approved, the VE limitation for all three sulfuric acid plants at Gardinier would be the same (10%), and would be consistent with the Hillsborough County and FDER VE limits for sulfuric acid plants.

KBN

If you should have any questions concerning the above requests, please do not hesitate to contact me.

Sincerely,

David A. Buff

David A. Buff, M.E., P.E.
Principal Engineer

cc: Ozzie Morris
T. Hanks
B. Andrews
B. Homas
J. Campbell

KBN

RECEIVED
AUG 13 1990
DER-BAQM

August 7, 1990

Mr. Clair Fancy, P.E.
Bureau Chief
Bureau of Air Regulation
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Re: Gardinier, Inc. Hillsborough County
Sulfuric Acid Plants No. 7 and No. 8

Dear Mr. Fancy:

This correspondence is in regards to the No. 7 and No. 8 Sulfuric Acid plants located at Gardinier, Inc., Hillsborough County. It is requested that the visible emissions limitation set forth in the most recent construction permits for these two sources be revised. A discussion of the permitting history of each source and the visible emission (VE) limitations is presented below.

No. 7 Sulfuric Acid Plant

The No. 7 Sulfuric Acid plant received a federal and state PSD permit in 1985 (AC29-089697). This permit authorized the increase in production rate from 1,750 tons per day (TPD) to 2,200 TPD. The VE opacity limitation determined as BACT for the expansion was the Hillsborough County rule contained in Chapter 1-3.30 V1.c. This rule allowed 5% opacity, with the exception that up to 40% opacity was allowed for 30 minute periods during plant startups. It appears that the sole basis for the BACT determination was the Hillsborough County rule. Since the limit was a rule, Gardinier in essence could not challenge the BACT determination at that time. It is noted that the Hillsborough VE regulation was more stringent than Florida's regulation, which limited VE to 10%.

In August 1985, Gardinier received the initial operating permit for the sulfuric acid expansion (AO29-104895). The VE limit in the permit was 5% opacity for any 6-minute consecutive period. This limit was somewhat different than limit stated in the construction permit.

Subsequent to this permit issuance, Hillsborough County rewrote portions of their air quality regulations, and in 1986 revised their VE regulation to conform to the state regulation. The new rule was codified in Chapter 1-3.63(a), and allowed 10% opacity except for a thirty minute period during plant startup, during which time 40% opacity is allowed. This rule is currently in effect in Hillsborough County.

As a result of the change in the Hillsborough County VE rule, in mid-1986 the Hillsborough County Environmental Protection Commission initiated efforts to revise the operating permit to be consistent with the Hillsborough County rule. DER subsequently revised the permit in a letter dated August 22, 1986, which amended Specific Condition 3.c. of the permit to 10% opacity, except that up to 40% is allowed for a thirty minute period during plant startup.

KBN ENGINEERING AND APPLIED SCIENCES, INC.
1034 Northwest 57th Street Gainesville, Florida 32605 904/331-9000 FAX: 904/332-4189

KBN

Gardinier was recently issued an operating permit renewal for No. 7 Sulfuric Acid plant. The new permit (AO29-178406), in Specific Condition 5, limits VE to 10% opacity. Specific Condition 8 of the permit contains provisions for excess emissions during times of startup, shutdown or malfunction. In addition, Specific Condition 23 requires that Gardinier apply to FDER's Bureau of Air Regulation in Tallahassee to request an amendment to Specific Condition 4 of the construction permit (AC29-89697) to be consistent with Specific Condition 5 of the operating permit. This condition reflects both Hillsborough County's and FDER Tampa's recognition that the construction permit needs to be amended, and that they believe the proper opacity limit is 10%.

Gardinier is requesting that the original BACT determination for VE of 5% opacity contained in the construction permit AC29-089697 be amended to reflect the 10% opacity limit that has been written into the operating permits for the source since 1986. This is also the current state and Hillsborough County limits for VE. It appears that the sole basis for the original BACT determination was the old Hillsborough County rule, so it is appropriate to revise the BACT based on the revised rule. Hillsborough County and FDER Tampa are in agreement with this request.

WRONG PERMIT NUMBER

No. 8 Sulfuric Acid Plant

The No. 8 Sulfuric Acid plant received a federal and state PSD permit in 1985 (AC29-089696) and again in 1987 (AC29-089696). These permits authorized the increase in production rate from 1,784 TPD to 2,200 TPD and 2,500 TPD, respectively. The VE opacity limitation determined as BACT for the 1985 expansion was the 5% opacity limitation contained in Hillsborough County Rule Chapter 1-3.30 V1.c. This BACT was determined jointly with the No. 7 Sulfuric Acid plant expansion in 1985. Again, it appears that the sole basis for the BACT determination was the Hillsborough County rule.

The BACT for the second plant expansion in 1987 was also 5% VE. FDER again referred to the Hillsborough County rule Chapter 1-3.03 V1.C as the sole justification for the limit. Apparently, the state was following the previous BACT determination for the source, and did not recognize that the Hillsborough County rule had been revised in 1986 to 10% opacity. However, the limit was corrected in the operating permit subsequently issued (AO29-162411) in October 1989. The VE limitation in Specific Condition 2 of this permit quotes the revised Hillsborough County rule of 10% opacity and references the rule citation.

Gardinier is therefore, requesting that the original BACT determination for VE of 5% opacity contained in the construction permit AC29-089696 for No. 8 Sulfuric Acid plant be amended to reflect the 10% opacity limit that has been written into the operating permit for the source. This is also the current state and Hillsborough County limits for VE. It appears that the sole basis for the original BACT determination was the old Hillsborough County rule, so it is appropriate to revise the BACT based on the revised rule.

If this request is approved, the VE limitation for all three sulfuric acid plants at Gardinier would be the same (10%), and would be consistent with the Hillsborough County and FDER VE limits for sulfuric acid plants.

If you should have any questions concerning the above requests, please do not hesitate to contact me.

Sincerely,

David A. Buff

David A. Buff, M.E., P.E.
Principal Engineer

cc: Ozzie Morris
H. Hanks
B. Andrews
B. Thomas
J. Campbell

NSPS FOR H_2SO_4 PLTS, SUB. H.

10% OPACITY (NO REF METHOD SPECIFIED)

AC 29 - 130371 (PSD-FL-118) - #8 H2SO4 Remaining
PSD-FL-026

Best Available Control Technology (BACT) Determination
Gardinier, Inc.
Hillsborough County

Gardinier, Inc. plans to increase the production rate of the No. 8 sulfuric acid plant that is located at their Tampa phosphate fertilizer chemical complex. Production of the No. 8 sulfuric acid plant will be increased from 2200 TPD to 2500 TPD. No restrictions to limit the hours of operation has been requested.

Increased production of the sulfuric acid plant will result in more air pollutants being emitted to the atmosphere. The primary air pollutants emitted from a sulfuric acid plant are sulfur dioxide (SO_2) and acid mist. The amount of sulfur dioxide emitted to the atmosphere is an inverse function of sulfur conversion efficiency. When sulfur trioxide combines with water vapor at a temperature below the dew point of sulfur trioxide, acid mist is formed. The amount of acid mist is usually dependent upon the type of sulfur feedstock, the strength of acid produced and the operational parameters in the absorber. Based on permitted emissions, the net increase in air pollutant emissions would be 219 tons of sulfur dioxide (SO_2) and 8.2 tons of acid mist per year.

Under the regulations, in Florida Administrative Code (FAC) Rule 17-2, the increase in sulfur dioxide and acid mist emissions exceed the significant emission rates as listed in Table 500-2. A BACT determination, therefore, is required for the regulated air pollutants sulfur dioxide and acid mist.

BACT Determination Request by the Applicant:

The air pollutant emissions from the No. 8 sulfuric acid plant would be limited to 4.0 pounds of sulfur dioxide (SO_2) and 0.15 pounds of acid mist per ton of 100% acid produced.

Date of Receipt of a BACT Application:

February 9, 1987

Date of Publication in Florida Administrative Weekly:

May 15, 1987

Review Group Members:

The determination was based upon comments received from the Stationary Source Control Section, Air Modeling and Data Analysis Section, the Southwest District Office, and the Hillsborough County Environmental Protection Commission.

BACT Determinied by DER:

Sulfuric Acid Plant No. 8:

Pollutant	Emission Limit
Sulfur Dioxide (SO_2)	Not to exceed 4 pounds per ton of 100% acid produced
Acid Mist[1]	Not to exceed 0.15 pounds per ton of 100% acid produced
Visible Emissions	5% opacity maximum

[1]Acid mist means sulfuric acid mist, as measured by EPA Method 8, 40 CFR 60, Appendix A.

Compliance with the emission limits will be in accordance with the test methods and procedures prescribed in subsection 40 CFR 60.85, Subpart H, New Source Performance Standards.

EPA Method 9, 40 CFR 60, Appendix A, will be used to determine compliance with the visible emission limit.

BACT Determination Rationale:

FAC Rule 17-2.100(117) defines "modification" as any physical change in, or change in the method of operation of, or addition to a stationary facility which increase the actual emissions of any air pollutant, regulated under this Chapter, including any not previously emitted, from any source within such facility.

If the increase in emissions as a result of the major source modification are equal to or greater than the significant emission rates listed in Table 500-2, Regulated Air Pollutants - Significant Emission Rates; a Best Available Control Technology (BACT) determination is required, Rule 17-2.500(5)(c). In no event shall application of BACT result in emissions of any pollutant which would exceed the emissions allowed under 40 CFR part 60 - New Source Performance Standards (NSPS), FAC Rule 17-2.630(1)(a).

Sulfuric acid plants are subject to the provisions of the New Source Performance Standards, 40 CFR 60.80, Subpart H. The standards under Subpart H are; 4.0 pounds of SO_2 per ton of acid produced and 0.15 pound of acid mist per ton of acid produced, expressed as 100 percent sulfuric acid. The visible emissions limit is less than 10 percent opacity.

The NSPS standards, Subpart H, were reviewed by EPA in 1979 and EPA concluded that from the standpoint of technology, and considering costs, and the small quantity of emissions in question, that it did not appear necessary to revise the standards. The Department has reviewed the test results obtained from several different sulfuric acid plants and concurs with EPA's conclusion. The provisions of Subpart H are judged to be BACT.

The visible emissions limitation determined as BACT is equal to Hillsborough County's requirement as per Chapter 1-3.03 V1.C - visible emissions shall not exceed 5% opacity except for 30 minute periods during plant startups when opacity shall be no greater than 40%.

The air quality impact of the proposed emissions has been analyzed. Atmospheric dispersion modeling has been completed and used in conjunction with an analysis of existing air quality to determine maximum ground-level ambient concentrations of the pollutants subject to BACT. Based on these analyses, the Department has reasonable assurance that the proposed sulfuric acid plant modifications, subject to the these BACT emission limitations, will not cause or contribute to a violation of the PSD increment or ambient air quality standard.

Details of the Analysis may be Obtained by Contacting:

Bob E. Daugherty
Department of Environmental Regulation
Bureau of Air Quality Management
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Recommended by:

for John C. Brown Jr
C. H. Fancy, Deputy Bureau Chief

Date: July 20, 1987

Approved by:

Dale Twachtmann, Secretary

Date: 7/22/87

Original BACT

Best Available Control Technology (BACT) Determination
Gardinier, Inc.
Hillsborough County

The applicant plans to increase the product rate from their Number 7 and Number 8 sulfuric acid plants that are located at their Tampa phosphate fertilizer complex. The production of sulfuric acid from the No. 7 plant will be increased from 1750 tons per day (TPD) to 2200 TPD, and the No. 8 plant from 1770 TPD also to 2200 TPD. No restrictions to limit the hours of operation of either plant has been requested.

Increasing the product output from the two sulfuric acid plants will also result in more air pollutants being emitted to the atmosphere. The air pollutants emitted from a sulfuric acid plant are sulfur dioxide (SO_2) and acid mist. The amount of SO_2 emitted to the atmosphere is an inverse function of sulfur conversion efficiency. When sulfur trioxide combines with water vapor at a temperature below the dew point of sulfur trioxide, acid mist is formed. The amount of acid mist is usually dependent upon the type of sulfur feedstock, the strength of acid produced, and the operational parameters in the absorber. Based upon the applicant's data, the net increase in air pollutant emissions would be 2327 tons of SO_2 and 92 tons of acid mist per year.

Under the regulations in Chapter 17-2, Florida Administrative Code, the increase in SO_2 and acid mist emissions exceed the significant emission rates as listed in Table 500-2. A BACT determination, therefore, is required for the regulated air pollutants sulfur dioxide and acid mist.

BACT Determination Requested by the Applicant:

The air pollutant emissions from No. 7 sulfuric acid plant would be limited to 4 pounds of SO_2 and 0.15 pounds of acid mist per ton of 100% acid produced.

The air pollutant emissions from No. 8 sulfuric acid plant would be limited to 10 pounds of SO_2 and 0.30 pounds of acid mist per ton of 100% acid produced.

Date Receipt of a BACT application:

July 6, 1984

Date of Publication in the Florida Administrative Weekly:

July 27, 1984

Review Group Members:

The determination was based upon comments received from the Stationary Source Control Section, Air Modeling and Data Analysis Section, the Southwest District Office, and the Hillsborough County Environmental Protection Commission.

BACT Determined by DER:

Sulfuric Acid Plants No. 7 and No. 8

Pollutant	Emission Limit
Sulfur Dioxide (SO_2)	Not to exceed 4 pounds per ton of 100% acid produced
Acid Mist[1]	Not to exceed 0.15 pounds per ton of 100% acid produced
Visible Emissions	5% opacity maximum

[1] Acid mist means sulfuric acid mist, as measured by Method 8 of 40 CFR 60, Appendix A.

Compliance with the emission limits will be in accordance with the test methods and procedures prescribed in subsection 60.85, Subpart H, New Source Performance Standards.

DER Method 9 (17-2.700(6)(a)9, FAC) will be used to determine compliance with the visible emission limit.

BACT Determination Rationale:

Florida Administrative Code Rule 17-2.100(105) defines "modification" as any physical change in, or addition to a stationary facility which increase the actual emissions of any air pollutant, regulated under this Chapter, including any not previously emitted, from any source within such facility.

If the increase in emissions as a result of the major source modification are equal to or greater than the significant emission rates listed in Table 500-2, Regulated Air Pollutants - Significant Emission Rates; a Best Available Control Technology (BACT) determination is required, Rule 17-2.500(5)(c). In no event shall application of BACT result in emissions of any pollutant which would exceed the emissions allowed under 40 CFR Part 60 - New Source Performance Standards (NSPS), Rule 17-2.630(1)(a).

Sulfuric acid plants are subject to the provisions of the New Source Performance Standards, 40 CFR 60.80, Subpart H. The standards under Subpart H are; 4.0 pounds of SO_2 per ton of acid produced and 0.15 pound of acid mist per ton of acid produced, expressed as 100 percent sulfuric acid. The visible emissions limit is less than 10 percent opacity.

The NSPS standards, Subpart H, were reviewed by EPA in 1979 and EPA concluded that from the standpoint of technology, and considering costs, and the small quantity of emissions in question, that it did not appear necessary to revise the standards. The department has reviewed the test results obtained from several different sulfuric acid plants and concurs with EPA's conclusion. The provisions of Subpart H are judged to be BACT.

The visible emissions limitation determined as BACT is equal to Hillsborough County's requirement as per Chapter 1-3.03 V1.C - visible emissions shall not exceed 5% opacity except for 30 minute periods during plant startups when opacity shall be no greater than 40%.

The air quality impact of the proposed emissions has been analyzed. Atmospheric dispersion modeling has been completed and used in conjunction with an analysis of existing air quality to determine maximum ground-level ambient concentrations of the pollutants subject to BACT. Based on these analyses, the department has reasonable assurance that the proposed sulfuric acid plant modifications, subject to the these BACT emission limitations, will not cause or contribute to a violation of the PSD increment or ambient air quality standard.

Details of the Analysis may be Obtained by Contacting:

Ed Palagyi
Department of Environmental Regulation
Bureau of Air Quality Management
2600 Blair Stone Road
Tallahassee, Florida 32301

Recommended by:

C. H. Fancy, Deputy Bureau Chief

Date: 2/8/85

Approved by:

for Victoria J. Tschinkel, Secretary

Date: 2/12/85

Copy Tampa Post 8/15/85

GARDINIER INC.

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

August 7, 1985

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

Subject: No. 8 Sulfuric Acid Plant, Construction Permit No. AC29-089696, Bi-Annual Progress Report

Dear Mr. Fancy:

The "Step-One Modifications" to our No. 8 Sulfuric Acid Plant have been completed. As a result, the plant is now capable of up to 2,080 STPD production while maintaining emissions levels below 4 lb SO_2/Ton of Acid and 0.15 lb Mist/Ton of Acid.

As stated in our application, we expect to continue operating in compliance at or below this level until the "Step-Two Modifications" are implemented. At this point we do not have a scheduled date for this step.

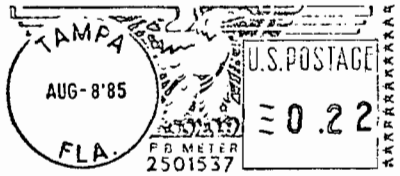
Very truly yours,

E. O. Morris

EOM:rw
cc: HCEPC

E. O. Morris
Manager
Environmental & Development

GARDINIER INC.
P. O. BOX 3269 TAMPA, FLORIDA 33601



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

GARDINIER INC.

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

March 27, 1985

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

Subject: Permit No. AC29-089697, No. 7 Sulfuric Acid Plant

Dear Mr. Fancy:

The subject construction permit expires July 1, 1985 and the application for the operation permit should be submitted by April 1, 1985.

There have been a few delays, both technical and economic, since the construction permit was issed in February 1985. Gardinier cannot have the application ready by April 1, 1985, therefore, we request a four-month extension of the construction permit to November 1, 1985.

All construction is essentially finished and, in all probability, the testing and the operating permit application will be completed in the near future. However, in a discussion with Willard Hanks, it was felt that the longer extension would cover all contingencies and a second extension would be avoided.

Please advise if there is a problem with this request.

Very truly yours,

A. E. Morrison
Manager
Environmental Services

AEM:rw
cc: Mr. Rudy J. Cabina
Mr. Frank Gonzalez
Mr. E. O. Morris
Mr. Bill Thomas, DER, Tampa
Mr. Jerry Campbell, HCEPC

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET
ATLANTA, GEORGIA 30365

MAR 6 1985

DER
MAR 11 1985
BAQM

REF: APT-AM

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

RE: PSD-FL-101 - Gardinier, Inc.

Dear Mr. Fancy:

This is to acknowledge receipt of your February 14, 1985, final determination for the above referenced company's sulfuric acid plant modifications. By letter dated January 16, 1985, we notified you that the determinations would not be subject to review under the Region IV Overview of State Programs policy.

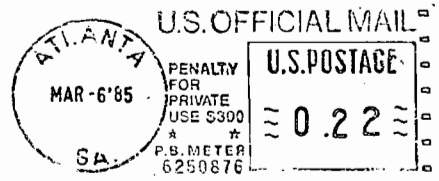
We will retain copies of the determinations and permits in our files.

Sincerely yours,

James T. Wilburn, Chief
Air Management Branch
Air, Pesticides, and Toxics Management Division

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET
ATLANTA, GEORGIA 30365

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300



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

20

No. 0158660

RECEIPT FOR CERTIFIED MAIL

**NO INSURANCE COVERAGE PROVIDED—
NOT FOR INTERNATIONAL MAIL**

(See Reverse)

SENT TO Mr. Rudy J. Cabina				
STREET AND NO.				
P.O., STATE AND ZIP CODE				
POSTAGE				$
CONSULT POSTMASTER FOR FEES	CERTIFIED FEE			¢
	OPTIONAL SERVICES	SPECIAL DELIVERY		¢
		RESTRICTED DELIVERY		¢
		RETURN RECEIPT SERVICE	SHOW TO WHOM AND DATE DELIVERED	¢
			SHOW TO WHOM, DATE, AND ADDRESS OF DELIVERY	¢
			SHOW TO WHOM AND DATE DELIVERED WITH RESTRICTED DELIVERY	¢
			SHOW TO WHOM, DATE AND ADDRESS OF DELIVERY WITH RESTRICTED DELIVERY	¢
TOTAL POSTAGE AND FEES				$
POSTMARK OR DATE 2/20/85				

PS Form 3800, Apr. 1976

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

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

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

January 7, 1985

Hillsborough County Commissioners
Hillsborough County Courthouse
Tampa, Florida 33601

Dear Commissioners:

RE: Preliminary Determination - Gardinier, Inc.
No. 7 and No. 8 Sulfuric Acid Plant Modification

I wish to bring to your attention that Gardinier, Inc. proposes to modify its existing facilities in Hillsborough County, Florida, and that emissions of air pollutants will thereby be increased. The Florida Department of Environmental Regulation, under the authority delegated by the U.S. Environmental Protection Agency, has reviewed the proposed construction under Federal Prevention of Significant Deterioration Regulations (40 CFR 52.21) and reached a preliminary determination of approval, with conditions, for this construction.

Please also be aware that the attached Public Notice announcing the preliminary determination, the availability of pertinent information for public scrutiny and the opportunity for public comment will be published in the near future in a newspaper of general circulation in Hillsborough County. This notice has been mailed to you for your information and in accordance with regulatory requirements. You need take no action unless you wish to comment on the proposed construction. If you have any questions, please feel free to call Mr. Bill Thomas or myself at (904)488-1344.

Sincerely,

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

CHF/pa
Enclosure

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

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

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

January 7, 1985

Mr. Glen A. Carowan, Jr.
Refuge Manager
Chassahowitzka National
Wildlife Refuge
Route 2, Box 44
Homosassa, Florida 32646

Dear Mr. Carowan:

RE: Preliminary Determination - Gardinier, Inc.
No. 7 and No. 8 Sulfuric Acid Plant Modification

I wish to bring to your attention that Gardinier, Inc. proposes to modify its existing facilities in Hillsborough County, Florida, and that emissions of air pollutants will thereby be increased. The Florida Department of Environmental Regulation, under the authority delegated by the U.S. Environmental Protection Agency, has reviewed the proposed construction under Federal Prevention of Significant Deterioration Regulations (40 CFR 52.21) and reached a preliminary determination of approval, with conditions, for this construction.

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Sincerely,

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

CHF/pa

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

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

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

January 7, 1985

Mr. Ron Fahs
State A-95 Coordinator
Florida State Planning and
Development Clearinghouse
Office of Planning and Budget
The Capitol
Tallahassee, Florida 32301

Dear Mr. Fahs:

RE: Preliminary Determination - Gardinier, Inc.
No. 7 and No. 8 Sulfuric Acid Plant Modification

I wish to bring to your attention that Gardinier, Inc. proposes to modify its existing facilities in Hillsborough County, Florida, and that emissions of air pollutants will thereby be increased. The Florida Department of Environmental Regulation, under the authority delegated by the U.S. Environmental Protection Agency, has reviewed the proposed construction under Federal Prevention of Significant Deterioration Regulations (40 CFR 52.21) and reached a preliminary determination of approval, with conditions, for this construction.

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Sincerely,

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

CHF/pa

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

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

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

January 7, 1985

Tampa City Council
3rd Floor
City Hall
Tampa, Florida 33604

RE: Preliminary Determination - Gardinier, Inc.
No. 7 and No. 8 Sulfuric Acid Plant Modification

I wish to bring to your attention that Gardinier, Inc. proposes to modify its existing facilities in Hillsborough County, Florida, and that emissions of air pollutants will thereby be increased. The Florida Department of Environmental Regulation, under the authority delegated by the U.S. Environmental Protection Agency, has reviewed the proposed construction under Federal Prevention of Significant Deterioration Regulations (40 CFR 52.21) and reached a preliminary determination of approval, with conditions, for this construction.

Please also be aware that the attached Public Notice announcing the preliminary determination, the availability of pertinent information for public scrutiny and the opportunity for public comment will be published in the near future in a newspaper of general circulation in Hillsborough County. This notice has been mailed to you for your information and in accordance with regulatory requirements. You need take no action unless you wish to comment on the proposed construction. If you have any questions, please feel free to call Mr. Bill Thomas or myself at (904)488-1344.

Sincerely,

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

CHF/pa
Enclosure

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

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

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

January 7, 1985

Mr. William S. Ockunzzi
Executive Director
Tampa Bay Regional Planning Council
9455 Koger Boulevard
St. Petersburg, Florida 33702

Dear Mr. Ockunzzi:

RE: Preliminary Determination - Gardinier, Inc.
No. 7 and No. 8 Sulfuric Acid Plant Modification

I wish to bring to your attention that Gardinier, Inc. proposes to modify its existing facilities in Hillsborough County, Florida, and that emissions of air pollutants will thereby be increased. The Florida Department of Environmental Regulation, under the authority delegated by the U.S. Environmental Protection Agency, has reviewed the proposed construction under Federal Prevention of Significant Deterioration Regulations (40 CFR 52.21) and reached a preliminary determination of approval, with conditions, for this construction.

Please also be aware that the attached Public Notice announcing the preliminary determination, the availability of pertinent information for public scrutiny and the opportunity for public comment will be published in the near future in a newspaper of general circulation in Hillsborough County. This notice has been mailed to you for your information and in accordance with regulatory requirements. You need take no action unless you wish to comment on the proposed construction. If you have any questions, please feel free to call Mr. Bill Thomas or myself at (904)488-1344.

Sincerely,

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

CHF/pa
Enclosure

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

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

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

April 5, 1985

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Rudy J. Cabina
Gardinier, Inc.
Post Office Box 3269
Tampa, Florida 33601

Dear Mr. Cabina:

Re: Modification of Conditions
Permit No. AC 29-089697

The department is in receipt of Mr. A. E. Morrison's letter dated March 27, 1985, that requested the referenced construction permit for the No. 7 Sulfuric Acid Plant be extended until November 1, 1985, to allow time to complete the modification of the plant, conduct the compliance tests, and submit an application for permit to operate. This request is acceptable to the department and the expiration date is extended as noted below.

Expiration Date

From: July 1, 1985
To: November 1, 1985

Attachments to be Incorporated

4. Mr. A. E. Morrison's letter dated March 27, 1985.

This letter must be attached to the referenced construction permit and shall become a part of that permit.

Sincerely,

Victoria J. Tschinkel
Secretary

VJT/ks

cc: Bill Thomas
Jerry Campbell

attachment: 3/27/85 letter

DER

APR 9 1985

BAQM

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

INTEROFFICE MEMORANDUM

For Routing To District Offices And/Or To Other Than The Addressee		
To:		Loctn.:
To:		Loctn.:
To:		Loctn.:
From:		Date:
Reply Optional [ ]	Reply Required [ ]	Info. Only [ ]
Date Due:	Date Due:	

TO: Victoria J. Tschinkel

FROM: Clair Fancy CHF

DATE: April 4, 1985

SUBJ: Modification of Permit Conditions

Attached is a letter drafted for your signature that will extend the expiration date of construction permit No. AC 29-089697 that was issued for Gardinier's No. 7 sulfuric acid plant.

The bureau recommends that the extension be approved.

CHF/WH/s

attachment

No. 0155546

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED—
NOT FOR INTERNATIONAL MAIL
(See Reverse)

SENT TO
Mr. Rudy J. Cabina

STREET AND NO.

P.O., STATE AND ZIP CODE

POSTAGE	$
CERTIFIED FEE	¢
SPECIAL DELIVERY	¢
RESTRICTED DELIVERY	¢
RETURN RECEIPT SERVICE — SHOW TO WHOM AND DATE DELIVERED	¢
RETURN RECEIPT SERVICE — SHOW TO WHOM, DATE, AND ADDRESS OF DELIVERY	¢
RETURN RECEIPT SERVICE — SHOW TO WHOM AND DATE DELIVERED WITH RESTRICTED DELIVERY	¢
RETURN RECEIPT SERVICE — SHOW TO WHOM, DATE AND ADDRESS OF DELIVERY WITH RESTRICTED DELIVERY	¢
TOTAL POSTAGE AND FEES	$

CONSULT POSTMASTER FOR FEES
OPTIONAL SERVICES

POSTMARK OR DATE

4/10/85

PS Form 3800, Apr. 1976

PS Form 3811, July 1983

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

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

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

3. Article Addressed to:
Mr. Rudy J. Cabina
Gardinier, Inc.
Post Office Box 3269
Tampa, Florida 33601

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

Article Number
0155546

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature — Addressee
X

6. Signature — Agent
X

7. Date of Delivery

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

DOMESTIC RETURN RECEIPT

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

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

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

February 14, 1985

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Mr. Rudy J. Cabina
Gardinier, Inc.
Post Office Box 3269
Tampa, Florida 33601

Dear Mr. Cabina:

Enclosed are Permit Numbers AC 29-089696 and AC 29-089697 dated February 8, 1985, to Gardinier, Inc. issued pursuant to Section 403, Florida Statutes.

Acceptance of these permits constitutes notice and agreement that the department will periodically review these permits for compliance, including site inspections where applicable, and may initiate enforcement actions for violation of the conditions and requirements thereof.

Sincerely,

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

CHF/pa

Enclosure

cc: James T. Wilburn
Bill Thomas
Steve Gyorog
Al Morrison

No. 0155775

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED—
NOT FOR INTERNATIONAL MAIL

(See Reverse)

SENT TO
Rudy J. Cabina

STREET AND NO.

P.O., STATE AND ZIP CODE

POSTAGE		$
CONSULT POSTMASTER FOR FEES — OPTIONAL SERVICES: CERTIFIED FEE		¢
SPECIAL DELIVERY		¢
RESTRICTED DELIVERY		¢
RETURN RECEIPT SERVICE	SHOW TO WHOM AND DATE DELIVERED	¢
	SHOW TO WHOM, DATE, AND ADDRESS OF DELIVERY	¢
	SHOW TO WHOM AND DATE DELIVERED WITH RESTRICTED DELIVERY	¢
	SHOW TO WHOM, DATE AND ADDRESS OF DELIVERY WITH RESTRICTED DELIVERY	¢
TOTAL POSTAGE AND FEES		$

POSTMARK OR DATE

11/16/84

PS Form 3800, Apr. 1976

PS Form 3811, Jan. 1979

SENDER: Complete items 1, 2, and 3. Add your address in the "RETURN TO" space on reverse.

1. The following service is requested (check one.)
   - ☒ Show to whom and date delivered..... ¢
   - ☐ Show to whom, date and address of delivery.... ¢
   - ☐ RESTRICTED DELIVERY
     Show to whom and date delivered..... ¢
   - ☐ RESTRICTED DELIVERY.
     Show to whom, date, and address of delivery.$

(CONSULT POSTMASTER FOR FEES)

2. ARTICLE ADDRESSED TO:
Rudy J. Cabina
P. O. Box 3269
Tampa, FL 33601

3. ARTICLE DESCRIPTION:

REGISTERED NO.	CERTIFIED NO.	INSURED NO.
	0155775	

(Always obtain signature of addressee or agent)

I have received the article described above.
SIGNATURE ☐Addressee ☐Authorized agent

4. DATE OF DELIVERY: NOV 19 1984 POSTMARK

5. ADDRESS (Complete only if requested)

6. UNABLE TO DELIVER BECAUSE: CLERK'S INITIALS

RETURN RECEIPT, REGISTERED, INSURED AND CERTIFIED MAIL

☆GPO : 1979-300-459

Final Determination

Gardinier, Inc.
Gibsonton, Florida
Hillsborough County

Modifications of Sulfuric Acid Plants
Construction Permit Numbers
No. 7 Sulfuric Acid Plant, AC 29-089697
No. 8 Sulfuric Acid Plant, AC 29-089696

PSD-FL-101

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

February 8, 1985

Final Determination
Gardinier, Inc.
AC 29-089697 and AC 29-089696

The Technical Evaluation and Preliminary Determination for the proposed modifications to the Nos. 7 and 8 sulfuric acid plants at Gardinier, Inc.'s existing phosphate fertilizer chemical complex were distributed on December 13, 1984. The Notice of Proposed Agency Action on the Permit Applications was published in The Tampa Tribune on December 31, 1984. The Bureau received a memorandum from our Southwest District office recommending additions to the specific conditions of the construction permits. These recommendations were that Hillsborough County Environmental Protection Commission be notified prior to any compliance tests of the modified plants, that the production of the plants during the compliance tests be specified in the permits and that the Company comply with the department's regulations on unconfined particulate matter emissions. The Bureau is in agreement with the District's recommendations and has incorporated them in the permits to construct by modifying Specific Conditions Nos. 5 and 11. General Condition No. 13 was also changed to show that the modified plants must comply with the New Source Performance Standards as required by Specific Condition No. 7. No other comments on the department's Intent to Issue were submitted.

The final action of the department will be to issue the permits to construct with the changes discussed above.

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

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

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

PERMITTEE:
Gardinier, Inc.
P. O. Box 3269
Tampa, Florida 33601

Permit Number:AC 29-089696
Expiration Date: October 1, 1987
County: Hillsborough
Latitude/Longitude: 27° 51' 28"N
82° 23' 15"W/
Project: No. 8 Sulfuric Acid Plant

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rule(s) 17-2 and 17-4, and 40 CFR 52.21. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawings, plans, and other documents attached hereto or on file with the department and made a part hereof and specifically described as follows:

Modifications to the No. 8 sulfuric acid plant that will increase production from 1770 to 2200 TPD. The modifications involve installing parallel gas ducting to the last two catalyst masses, installing larger steam piping from the plant, installing a superheater parallel with the No. 1 boiler, installing a superheater/economizer in the exit of the 3A pass, installing additional catalyst in the main converter, replacing the existing acid cast iron cooling coils with stainless steel heat exchangers, and other major modifications that have prior approval of the department and the Hillsborough County Environmental Protection Commission.

The UTM coordinates of the site are 17-363.3 Km E and 3082.4 Km N.

Construction shall be in accordance with the application for a permit to construct the No. 8 sulfuric acid plant that was signed by Mr. Rudy J. Cabina on July 3, 1984, and the additional information supplied in Gardinier, Inc.'s September 11, 1984, and October 15, 1984, letters except for the changes mentioned in the Technical Evaluation and Preliminary Determination and listed as specific conditions in the permit to construct.

PERMITTEE:
Gardinier, Inc.

Permit Number: AC 29-089696
Expiration Date: October 1, 1987

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions" and as such are binding upon the permittee and enforceable pursuant to the authority of Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is hereby placed on notice that the department will review this permit periodically and may initiate enforcement action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the department.

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit does not constitute a waiver of or approval of any other department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute state recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, plant or aquatic life or property and penalties therefore caused by the construction or operation of this permitted source, nor does it allow the permittee to cause pollution in contravention of Florida Statutes and department rules, unless specifically authorized by an order from the department.

GENERAL CONDITIONS:

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

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

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

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

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

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

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately notify and provide the department with the following information:

a. a description of and cause of non-compliance; and

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

GENERAL CONDITIONS:

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the department for penalties or revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, which are submitted to the department, may be used by the department as evidence in any enforcement case arising under the Florida Statutes or department rules, except where such use is proscribed by Sections 403.73 and 403.111, Florida Statutes.

10. The permittee agrees to comply with changes in department rules and Florida Statutes after a reasonable time for compliance, provided however, the permittee does not waive any other rights granted by Florida Statutes or department rules.

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

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

13. This permit also constitutes:

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

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

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

GENERAL CONDITIONS:

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

c. Records of monitoring information shall include:

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

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

SPECIFIC CONDITIONS:

1. Sulfuric acid production, measured as 100 percent H_2SO_4, shall not exceed 2,200 TPD.

2. Sulfur dioxide emissions shall not exceed 4.0 lb/ton acid and 8,800 lb/day.

3. Acid mist emissions shall not exceed 0.15 lb/ton acid and 330 lb/day.

4. Visible emissions shall not exceed 5 percent opacity, average for any consecutive 6 minute period.

SPECIFIC CONDITIONS:

5. All compliance tests shall be conducted while the plant is operating within 5 percent of its permitted capacity of 91.7 TPH acid. The test methods and procedures described in 40 CFR 60.85 shall be used to determine the compliance status of the source with the sulfur dioxide and acid mist standards. Method 9, as described in 40 CFR 60, Appendix A, shall be used to determine the compliance status of the source with the visible emissions standard. Hillsborough County Environmental Protection Commission shall be notifed in writing 15 days prior to any compliance test.

6. A continuous monitoring system for the measurement of sulfur dioxide shall be installed, calibrated, maintained, and operated on this plant as specified in 40 CFR 60.84. Excess emissions shall be reported to the Hillsborough County Environmental Protection Commission.

7. The applicant shall comply with all requirements of 40 CFR 60, Subpart H, Standards of Performance for Sulfuric Acid Plants.

8. The plant may operated continuously, 8760 hours per year.

9. This construction permit replaces the current operating permit for this sulfuric acid plant. During the modifications of this plant, the emissions shall not exceed 10 lb SO_2 per ton of acid and 0.15 lb acid mist per ton of acid while the plant is operating commercially.

10. Construction shall reasonably conform to the plans and schedule in the application and October 15, 1984 letter. Bi-annual reports describing the status of the modifications shall be submitted to the state and county regulatory agencies. Gardinier, Inc. shall obtain prior approval from the department and county before proceeding with any construction referred to as "Third Modification" in the October 15, 1984 letter.

11. Gardinier, Inc. shall take precautionary measures to prevent emissions from leaks at the plant. All reasonable precautions shall be taken to prevent and control generation of unconfined emissions of particulate matter in accordance with the provisions in Section 17-2.610(3), FAC. These provisions are applicable to any source, including, but not limited to, vehicular movement, transportation of materials, construction, alteration, demolition or wrecking, or industrial related activities such as loading, unloading, storing and handling.

PERMITTEE:
Gardinier, Inc.

Permit Number: AC 29-089696
Expiration Date: October 1, 1987

SPECIFIC CONDITIONS:

12. Gardinier, Inc. shall submit a complete application for a permit to operate the sulfuric acid plant, which includes an emissions test report, to the Hillsborough County Environmental Protection Commission at least 90 days prior to the expiration date of this construction permit. Gardinier, Inc. may continue to operate this sulfuric acid plant, if the source is in compliance with the conditions in this permit, until the expiration date of this construction permit or until the expiration date of any permit to operate that is issued for this source.

13. Upon obtaining a permit to operate, the applicant will be required to submit annual operation reports which shall include, as a minimum, the annual production of the plant and a recent emissions test report.

Issued this 8th day of Feb, 1985

STATE OF FLORIDA DEPARTMENT OF
ENVIRONMENTAL REGULATION

for VICTORIA J. TSCHINKEL, Secretary

____ pages attached.

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

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

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

PERMITTEE:
Gardinier, Inc.
P. O. Box 3269
Tampa, Florida 33601

Permit Number:AC 29-089697
Expiration Date: July 1, 1985
County: Hillsborough
Latitude/Longitude: 27° 51' 28"N
82° 23' 15"W/
Project: No. 7 Sulfuric Acid Plant

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rule(s) 17-2 and 17-4, and 40 CFR 52.21. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawings, plans, and other documents attached hereto or on file with the department and made a part hereof and specifically described as follows:

Modifications to the No. 7 sulfuric acid plant that will increase production from 1750 to 2200 TPD. The modifications involve changing the acid cross-circulating system between the interpass tower acid coolers and pump tanks to a hot cross flow system, adding new mixing vanes in the gas duct to the second catalyst mass, and installing a separate pump to transfer water from the existing cooling water tower to the final absorbing tower.

The UTM coordinates of the site are 17-363.2 Km E and 3082.3 Km N.

Construction shall be in accordance with the application for a permit to construct the No. 7 sulfuric acid plant that was signed by Mr. Rudy J. Cabina on July 3, 1984, and the additional information supplied in Gardinier, Inc.'s September 11, 1984, and October 15, 1984, letters except for the changes mentioned in the Technical Evaluation and Preliminary Determination and listed as specific conditions in the permit to construct.

PERMITTEE:
Gardinier, Inc.

Permit Number: AC 29-089697
Expiration Date: July 1, 1985

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions" and as such are binding upon the permittee and enforceable pursuant to the authority of Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is hereby placed on notice that the department will review this permit periodically and may initiate enforcement action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the department.

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit does not constitute a waiver of or approval of any other department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute state recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, plant or aquatic life or property and penalties therefore caused by the construction or operation of this permitted source, nor does it allow the permittee to cause pollution in contravention of Florida Statutes and department rules, unless specifically authorized by an order from the department.

GENERAL CONDITIONS:

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

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

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

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

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

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

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately notify and provide the department with the following information:

a. a description of and cause of non-compliance; and

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

GENERAL CONDITIONS:

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the department for penalties or revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, which are submitted to the department, may be used by the department as evidence in any enforcement case arising under the Florida Statutes or department rules, except where such use is proscribed by Sections 403.73 and 403.111, Florida Statutes.

10. The permittee agrees to comply with changes in department rules and Florida Statutes after a reasonable time for compliance, provided however, the permittee does not waive any other rights granted by Florida Statutes or department rules.

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

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

13. This permit also constitutes:

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

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

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

GENERAL CONDITIONS:

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

c. Records of monitoring information shall include:

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

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

SPECIFIC CONDITIONS:

1. Sulfuric acid production, measured as 100 percent H_2SO_4, shall not exceed 2,200 TPD.

2. Sulfur dioxide emissions shall not exceed 4.0 lb/ton acid and 8,800 lb/day.

3. Acid mist emissions shall not exceed 0.15 lb/ton acid and 330 lb/day.

4. Visible emissions shall not exceed 5 percent opacity, average for any consecutive 6 minute period.

PERMITTEE:
Gardinier, Inc.

Permit Number: AC 29-089697
Expiration Date: July 1, 1985

SPECIFIC CONDITIONS:

5. All compliance tests shall be conducted while the plant is operating within 5 percent of its permitted capacity of 91.7 TPH acid. The test methods and procedures described in 40 CFR 60.85 shall be used to determine the compliance status of the source with the sulfur dioxide and acid mist standards. Method 9, as described in 40 CFR 60, Appendix A, shall be used to determine the compliance status of the source with the visible emissions standard. Hillsborough County Environmental Protection Commission shall be notifed in writing 15 days prior to any compliance test.

6. A continuous monitoring system for the measurement of sulfur dioxide shall be installed, calibrated, maintained, and operated on this plant as specified in 40 CFR 60.84. Excess emissions shall be reported to the Hillsborough County Environmental Protection Commission.

7. The applicant shall comply with all requirements of 40 CFR 60, Subpart H, Standards of Performance for Sulfuric Acid Plants.

8. The plant may operate continuously, 8760 hours per year.

9. This construction permit replaces the current operating permit for this sulfuric acid plant. During the modifications to this plant, the emissions shall not exceed 4.0 lb SO_2 per ton acid and 0.15 lb acid mist per ton of acid while the plant is operating commercially.

10. Construction shall reasonably conform to the plans and schedule in the application. Any delays encountered during construction will be reported to the Hillsborough County Environmental Protection Commission.

11. Gardinier, Inc. shall take precautionary measures to prevent emissions from leaks at the plant. All reasonable precautions shall be taken to prevent and control generation of unconfined emissions of particulate matter in accordance with the provisions in Section 17-2.610(3), FAC. These provisions are applicable to any source, including, but not limited to, vehicular movement, transportation of materials, construction, alteration, demolition or wrecking, or industrial related activities such as loading, unloading, storing and handling.

PERMITTEE:
Gardinier, Inc.

Permit Number: AC 29-089697
Expiration Date: July 1, 1985

SPECIFIC CONDITIONS:

12. Gardinier, Inc. shall submit a complete application for a permit to operate the sulfuric acid plant, which includes an emissions test report, to the Hillsborough County Environmental Protection Commission at least 90 days prior to the expiration date of this construction permit. Gardinier, Inc. may continue to operate this sulfuric acid plant, if the source is in compliance with the conditions in this permit, until the expiration date of this construction permit or until the expiration date of any permit to operate that is issued for this source.

13. Upon obtaining a permit to operate, the applicant will be required to submit annual operation reports which shall include, as a minimum, the annual production of the plant and a recent emissions test report.

Issued this 8th day of Feb, 1985

STATE OF FLORIDA DEPARTMENT OF
ENVIRONMENTAL REGULATION

for VICTORIA J. TSCHINKEL, Secretary

____ pages attached.

Best Available Control Technology (BACT) Determination
Gardinier, Inc.
Hillsborough County

The applicant plans to increase the product rate from their Number 7 and Number 8 sulfuric acid plants that are located at their Tampa phosphate fertilizer complex. The production of sulfuric acid from the No. 7 plant will be increased from 1750 tons per day (TPD) to 2200 TPD, and the No. 8 plant from 1770 TPD also to 2200 TPD. No restrictions to limit the hours of operation of either plant has been requested.

Increasing the product output from the two sulfuric acid plants will also result in more air pollutants being emitted to the atmosphere. The air pollutants emitted from a sulfuric acid plant are sulfur dioxide (SO_2) and acid mist. The amount of SO_2 emitted to the atmosphere is an inverse function of sulfur conversion efficiency. When sulfur trioxide combines with water vapor at a temperature below the dew point of sulfur trioxide, acid mist is formed. The amount of acid mist is usually dependent upon the type of sulfur feedstock, the strength of acid produced, and the operational parameters in the absorber. Based upon the applicant's data, the net increase in air pollutant emissions would be 2327 tons of SO_2 and 92 tons of acid mist per year.

Under the regulations in Chapter 17-2, Florida Administrative Code, the increase in SO_2 and acid mist emissions exceed the significant emission rates as listed in Table 500-2. A BACT determination, therefore, is required for the regulated air pollutants sulfur dioxide and acid mist.

BACT Determination Requested by the Applicant:

The air pollutant emissions from No. 7 sulfuric acid plant would be limited to 4 pounds of SO_2 and 0.15 pounds of acid mist per ton of 100% acid produced.

The air pollutant emissions from No. 8 sulfuric acid plant would be limited to 10 pounds of SO_2 and 0.30 pounds of acid mist per ton of 100% acid produced.

Date Receipt of a BACT application:

July 6, 1984

Date of Publication in the Florida Administrative Weekly:

July 27, 1984

Review Group Members:

The determination was based upon comments received from the Stationary Source Control Section, Air Modeling and Data Analysis Section, the Southwest District Office, and the Hillsborough County Environmental Protection Commission.

BACT Determined by DER:

Sulfuric Acid Plants No. 7 and No. 8

Pollutant	Emission Limit
Sulfur Dioxide (SO_2)	Not to exceed 4 pounds per ton of 100% acid produced
Acid Mist[1]	Not to exceed 0.15 pounds per ton of 100% acid produced
Visible Emissions	5% opacity maximum

[1] Acid mist means sulfuric acid mist, as measured by Method 8 of 40 CFR 60, Appendix A.

Compliance with the emission limits will be in accordance with the test methods and procedures prescribed in subsection 60.85, Subpart H, New Source Performance Standards.

DER Method 9 (17-2.700(6)(a)9, FAC) will be used to determine compliance with the visible emission limit.

BACT Determination Rationale:

Florida Administrative Code Rule 17-2.100(105) defines "modification" as any physical change in, or addition to a stationary facility which increase the actual emissions of any air pollutant, regulated under this Chapter, including any not previously emitted, from any source within such facility.

If the increase in emissions as a result of the major source modification are equal to or greater than the significant emission rates listed in Table 500-2, Regulated Air Pollutants - Significant Emission Rates; a Best Available Control Technology (BACT) determination is required, Rule 17-2.500(5)(c). In no event shall application of BACT result in emissions of any pollutant which would exceed the emissions allowed under 40 CFR Part 60 - New Source Performance Standards (NSPS), Rule 17-2.630(1)(a).

Sulfuric acid plants are subject to the provisions of the New Source Performance Standards, 40 CFR 60.80, Subpart H. The standards under Subpart H are; 4.0 pounds of SO_2 per ton of acid produced and 0.15 pound of acid mist per ton of acid produced, expressed as 100 percent sulfuric acid. The visible emissions limit is less than 10 percent opacity.

The NSPS standards, Subpart H, were reviewed by EPA in 1979 and EPA concluded that from the standpoint of technology, and considering costs, and the small quantity of emissions in question, that it did not appear necessary to revise the standards. The department has reviewed the test results obtained from several different sulfuric acid plants and concurs with EPA's conclusion. The provisions of Subpart H are judged to be BACT.

The visible emissions limitation determined as BACT is equal to Hillsborough County's requirement as per Chapter 1-3.03 V1.C - visible emissions shall not exceed 5% opacity except for 30 minute periods during plant startups when opacity shall be no greater than 40%.

The air quality impact of the proposed emissions has been analyzed. Atmospheric dispersion modeling has been completed and used in conjunction with an analysis of existing air quality to determine maximum ground-level ambient concentrations of the pollutants subject to BACT. Based on these analyses, the department has reasonable assurance that the proposed sulfuric acid plant modifications, subject to the these BACT emission limitations, will not cause or contribute to a violation of the PSD increment or ambient air quality standard.

Details of the Analysis may be Obtained by Contacting:

Ed Palagyi
Department of Environmental Regulation
Bureau of Air Quality Management
2600 Blair Stone Road
Tallahassee, Florida 32301

Recommended by:

C. H. Fancy, Deputy Bureau Chief

Date: 2/8/85

Approved by:

for Victoria J. Tschinkel, Secretary

Date: 2/12/85

GARDINIER INC.

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

January 7, 1984

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

Subject: Publication of Legal Notice, Modifications to No. 7 and No. 8 Sulfuric Acid Plants

Dear Mr. Fancy:

Enclosed is a copy of the "Proof of Publication" issued by the Tampa Tribune concerning publication of the legal advertisement on modifications to Gardinier's No. 7 and No. 8 Sulfuric Acid Plants.

Very truly yours,

A. E. Morrison
Manager
Environmental Services

AEM:rw
Enclosure
cc: Mr. Rudy J. Cabina

THE TAMPA TRIBUNE

Published Daily
Tampa, Hillsborough County, Florida

State of Florida
County of Hillsborough } ss.

Before the undersigned authority personally appeared G. T. Gleason, who on oath says that he is Controller of The Tampa Tribune, a daily newspaper published at Tampa in Hillsborough County, Florida; that the attached copy of advertisement being a .....

LEGAL NOTICE

NOTICE OR PROPOSED AGENCY ACTION ON PERMIT APPLICATION

in the matter of The State of FL., Dept. of Environmental Regulation gives notice of its intent to issue permits to Gardinier, Inc.'s No. 7 & No. 8 Sulfuric acid plants which are located near Gibsonton Hillsborough County, Florida.

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

December 31, 1984

Affiant further says that the said The Tampa Tribune is a newspaper published at Tampa, in said Hillsborough County, Florida, and that the said newspaper has heretofore been continuously published in said Hillsborough County, Florida, each day and has been entered as second class mail matter at the post office in Tampa, in said Hillsborough County, Florida, for a period of one year next preceding the first publication of the attached copy of advertisement; and affiant further says that he has neither paid nor promised any person, firm, or corporation any discount, rebate, commission or refund for the purpose of securing this advertisement for publication in the said newspaper.

G. T. Gleason

Sworn to and subscribed before me, this 4th *day of* January *A.D. 1985*

(SEAL)

Notary Public, State of Florida at Large
My Commission Expires Jan. 25, 1986

DER
JAN 9 1985
BAQM

of Environmental Regulation
Notice of Proposed Agency Action on Permit Applications

The Department of Environmental Regulation gives notice of its intent to issue permits to modify Gardinier, Inc.'s No. 7 and No. 8 sulfuric acid plants which are located near Gibsonton, Hillsborough County, Florida.

The Company has requested permission to make modifications to increase production of two existing sulfuric acid plants to 2,200 TPD. A Best Available Control Technology determination was required for each plant. the allowable emissions for each plant, after modifications, will be 4.0 lb sulfur dioxide and 0.15 lb acid mist per ton of acid produced, and visible emissions of 5 percent opacity. These emissions will not cause or contribute to an ambient air quality standard violation or violate any federal, state or county regulation. No increment consumption will result from the changes in emissions at this plant after this modification.

Persons whose substantial interests are affected by the department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must conform to the requirements of Chapters 17-103 and 28-5, Florida Administrative Code, and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Twin Towers Office Building, Tallahassee, Florida 32301, within fourteen (14) days of publication of this notice. Failure to file a request for hearing within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this preliminary statement. Therefore, persons who may not object to the proposed agency action may wish to intervene in the proceeding. A petition for intervention must be filed pursuant to Model Rule 28-5.207 at least five (5) days before the final hearing and be filed with the hearing officer if one has been assigned at the Division of Administrative Hearings, Department of Administration, 2009 Apalachee Parkway, Tallahassee, Florida 32301. If no hearing officer has been assigned, the petition is to be filed with the Department's Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32301. Failure to petition to intervene within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, Florida Statutes.

The application, technical evaluation, and Department's intent for the proposed project are available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday except legal holidays, at the following locations:

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

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

Hillsborough County; Environmental Protection Commission; 1900 9th Avenue; Tampa, Florida 33605

Any person may send written comments on the proposed action to Mr. Clair Fancy at the Department's Tallahassee address. All comments mailed within 14 days of the publication of this will be considered in the Department's final determination.

5458 12/31/

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

INTEROFFICE MEMORANDUM

For Routing To District Offices And/Or To Other Than The Addressee		
To: _____	Loctn.: _____	
To: _____	Loctn.: _____	
To: _____	Loctn.: _____	
From: _____	Date: _____	
Reply Optional [ ]	Reply Required [ ]	Info. Only [ ]
Date Due: _____	Date Due: _____	

TO: Clair Fancy

FROM: Bill Thomas

DATE: December 31, 1984

SUBJECT: Gardinier Nos. 7 & 8 Sulfuric Acid Plant Modifications, AC29-089696 and 089697, Technical Evaluation, 12/4/84

On the first page, section I B, end of 1st paragraph; correct typo to "2200", TPD acid.

In proposed permit specific conditions, add: (1) HCEPC shall be notified in writing, 15 days prior to any compliance testing; (2) Compliance testing shall be within ± 5% of the designed production rate, 91.7 TPH of Sulfuric Acid; (3) All reasonable precautions shall be taken to prevent and control generation of unconfined emissions of particulate matter in accordance with the provision in Section 17-2.610 - (3), F.A.C.. These provisions are applicable to any source, including, but not limited to, vehicular movement, transportation of materials, construction, alteration, demolition or wrecking, or industrial related activities such as loading, unloading, storing and handling.

Patty Adams

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

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

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

December 3, 1984

Gardinier, Inc
P. O. Box 3269
Tampa, Florida 33601

Attn: Tony Egitgo

Dear Mr Egitgo:

Analytical samples are enclosed to assist you in self evaluation of your fluoride procedures. I understnad that you are conducting experiments to build proof of confidence in the detection ability of the ion electrode method of using field samples spiked with knowns; plus other experiments.

An assessment of precision and accuracy of the procedure, based upon measured concentrations should be included in your planned quality control activities.

To further assist you, I have requested analytical samples from a federal agency which I am passing along. I understand that a state can request these free whereas a private firm cannot. My enclosures include:

1. Instructions for nitrate/fluoride analysis, with stated proviso's included.

2. The true values are included on separate sheet. The statistical numbers do not apply except to certain very specific Fluoride-Methods (353.1, 353.2, 353.3).

3. The concentration ranges, if you hit them, will be of positive value to your cause and your method. If missed, no detrimental significance will result, beyond the value of your own analytical understanding.

4. Instruction for Ampul opening and sample prep are enclosed.

Let me know if I can be of any further help.

Sincerely

Edward H. Sirois
Environmental Specialist
Bureau of Air Quality
Management

EHS:ht

enclosure

cc: D. R. Barker
R. J. Arbes
DER Gardinier File & P. Adams

U.S. Environmental Protection Agency

Quality Control Check Samples

Instructions for NITRATE/FLUORIDE Analyses

CAUTION: Read Instructions Carefully Before Opening Ampuls.

The requested set(s) of quality control sample concentrates are enclosed in this package. The quality control samples were prepared from the highest quality material available and were designed for and verified by the methodology stated in the EPA manual 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes," (Nitrate-Method 352.1 and Fluoride-Method 353.1, 353.2 and 353.3) Any other method of analyses may yield different results and would not be applicable or valid to the given statistics. These samples are to be used as a means to check the individual analyst's accuracy and precision related to the EPA methods. The quality control samples are not to be used as standards.

Sample Preparation

To begin the analyses, add approximately 900 mL of laboratory pure or tap water to a 1000 mL volumetric flask. Open an ampul by snapping the top off at the break area on the neck and pipet 20.0 mL of the concentrate into the volumetric flask. Dilute to volume and mix well.

The blank laboratory pure water should be analyzed concurrently for background correction. Comparison of recoveries from laboratory pure water and the tap water is a check on possible interferences.

A sheet containing the statement of added levels is attached with these instructions for use as you desire. If there are any questions or problems.

True Values for NITRATE/FLUORIDE

The mean recovery ($\bar{X}$) and the standard deviation (S) are listed below along with the true value and the 95% confidence interval. The true value represents the actural weighing and all subsequent dilutions. The 95% confidence interval represents the mean recovery plus or minus two standard deviations ($\bar{X} \pm 2S$). The mean recovery and the standard deviation were generated from data from Performance Evaluation Studies. All values below are expressed as mg/liter.

Parameter	True Value for Sample (4)	$\bar{X}$	S	95% Confidence Interval
Nitrate-Nitrogen	0.08	0.08	0.02	0.04 - 0.12
Fluoride	0.23	0.23	0.02	0.19 - 0.27

Parameter	True Value for Sample (13)	$\bar{X}$	S	95% Confidence Interval
Nitrate-Nitrogen	1.67	1.66	0.07	1.52 - 1.80
Fluoride	1.36	1.36	0.05	1.26 - 1.46

Parameter	True Value for Sample (15)	$\bar{X}$	S	95% Confidence Interval
Nitrate-Nitrogen	9.10	9.04	0.33	8.38 - 9.70
Fluoride	2.28	2.27	0.08	2.11 - 2.43

GARDINIER INC.

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

RUDY J. CABINA
VICE PRESIDENT

October 15, 1984

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

Subject: No. 8 Sulfuric Acid Plant Modification

Dear Mr. Fancy:

In response to your letter of September 26, 1984, Gardinier agrees that the No. 8 Sulfuric Acid Plant, after modifications, must meet new source performance standards of 4 lb. SO_2 and 0.15 lb Acid Mist per ton of sulfuric acid produced. Accordingly, will you please amend the previously submitted application by substituting Pages 2, 3, 6 and the supplemental requirements enclosed?

Due to economic considerations, we desire to phase this process as follows:

First Modification:

A. Install the necessary gas ducting to permit parallel gas flows through the last two catalyst masses in the main converter. This would allow increased production by reducing the pressure drop (resistance to gas flow) throughout the system.

B. Install larger diameter export steam piping to handle additional steam production from the plant.

If the facility cannot achieve 4 lb/ton and 0.15 lb/ton at the desired 2200 STPD; operating at production rates as required to remain below those limits would be necessary until the next major overhaul.

Second Modification:

C. Install a superheater in parallel with the No. 1 Boiler. This would reduce gas side pressure drop through this section of the plant and also relieve the loading of the No. 1 Boiler.

D. Install a new superheater/economizer in the exit of the 3A pass in parallel with the existing one. Lower gas temperature to the absorbing tower and reduced gas side pressure drop would result.

E. Install additional catalyst in main converter. This would improve conversion at higher rates, when "C" and "D" above, are installed.

F. Replace cast iron cooling coils with new stainless steel heat exchangers for acid cooling. This would allow slightly colder air into sulfur burner and remove possible bottlenecks on acid cooling system.

Third Modification:

If the above-described two steps do not achieve the desired 2200 STPD at 4 lb/ton of acid and 0.15 lb/mist/ton of acid than implementation of more extensive replacement of the steam system, boiler, blower and turbine, etc., would be required.

At no time during the construction period will 4 lb SO_2 and 0.15 lb acid mist per ton of sulfuric acid produced, be exceeded.

It is not possible at this time to estimate the cost of the project. It could be as low as $250,000 or as much as several million dollars.

If this letter is acceptable, please consider the applications for both the No. 7 and No. 8 Sulfuric Acid Plants complete as of this date and process them together.

Please contact me if you have any questions.

Yours very truly,

Rudy J. Cabina

Rudy J. Cabina
Vice President

RJC:rw
Enclosures
cc: Mr. Bill Thomas
Mr. Steve Gyotog

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.

This project wil modify the No. 8 Sulfuric Acid Plant to produce 430 tons per day of additional sulfuric acid. Emissions from this source will comply with all applicable State of Florida and Hillsborough County regulations.

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

Start of Construction November 1, 1984 Completion of Construction June 30, 1987

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 cover letter)

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

Permit No.	A029-18228	A029-2930	AC29-2390
Issued	Apr 26, 1979	Apr 21, 1977	Nov 25, 1974
Expire	Apr 15, 1984	May 10, 1979	Mar 1, 1977

E. Is this application associated with or part of a Development of Regional Impact (DRI) pursuant to Chapter 380, Florida Statutes, and Chapter 22F-2, Florida Administrative Code? ____ Yes __x__ No

F. Normal equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 52 ; if power plant, hrs/yr n/a ; if seasonal, describe: not seasonal

G. 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? Yes
   a. If yes, has "offset" been applied? N/A
   b. If yes, has "Lowest Achievable Emission Rate" been applied? N/A
   c. If yes, list non-attainment pollutants.
      Total suspended particulates, Ozone
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) requirements 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? Yes
5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? No

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		
Sulfur	-	-	60,124	A
Oxygen	-	-	89,913	B
Water	-	-	33,677	C

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

1. Total Process Input Rate (lbs/hr): 183,714

2. Product Weight (lbs/hr): 183,333

C. Airborne Contaminants Emitted:

Name of Contaminant	Emission[1]		Allowed Emission[2] Rate per Ch. 17-2, F.A.C.	Allowable[3] Emission lbs/hr	Potential Emission[4]		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/hr	T/yr	
Sulfur Dioxide	367	1,607	4 lb/ton H_2SO_4	367	367	1,607	D
Sulfuric Acid	13.7	60	0.15 lb/ton H_2SO_4	13.7	13.7	60	D

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

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles[5] Size Collected (in microns)	Basis for Efficiency (Sec. V, It[5]
Final Converter	Sulfur Dioxide	99.5+	-	See Attach.
Final Absorber and Mist	Sulfuric Acid	99+	Unk	
Eliminator	Mist			

[1]See Section V, Item 2.

[2]Reference applicable emission standards and units (e.g., Section 17-2.05(6) Table II, E. (1), F.A.C. – 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)

[5]If Applicable

9. An application fee of $20, unless exempted by Section 17-4.05(3), F.A.C. 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

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?
[X] Yes [ ] No

Contaminant	Rate or Concentration
Sulfur Dioxide	4 lb/ton H_2SO_4
Sulfuric Acid Mist	0.15 lb/ton H_2SO_4

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy) [ ] Yes [x] No

Contaminant	Rate or Concentration

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

Contaminant	Rate or Concentration
Sulfur Dioxide	4 lb/ton H_2SO_4
Sulfuric Acid Mist	0.15 lb/ton H_2SO_4

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

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:
5. Useful Life:
6. Operating Costs:
7. Energy:
8. Maintenance Cost:
9. Emissions:

Contaminant	Rate or Concentration

*Explain method of determining D 3 above.

Supplemental Requirements

1. Total Process Input Rate and Product Weight:

The following data and chemical equations will describe the input rates and product weight:

The atomic weight of sulfur (2) is 32.064
The molecular weight of oxygen (O_2) is 31.9988
The molecular weight of water (H_2O) is 18.01534
The molecular weight of sulfur dioxide (SO_2) is 64.0628
The molecular weight of sulfur trioxide (SO_3) is 80.0622
The molecular weight of sulfuric acid (H_2SO_4) is 98.0754

The following chemical equations describe the production of sulfuric acid:

$$S + O_2 \longrightarrow SO_2$$

$$SO_2 + \tfrac{1}{2}O_2 \longrightarrow SO_3$$

$$SO_3 + H_2O \longrightarrow H_2SO_4$$

If the plant produces 183,333 lbs/hr of H_2SO_4 and emits 367 lbs/hr of SO_2 and 13.7 lbs/hr of H_2SO_4 mist, then the amounts of sulfur, oxygen and water required are easily calculated. These amounts are:

Sulfur = 60,124 lbs/hr

Oxygen = 89,913 lbs/hr

Water = 33,677 lbs/hr

Total = 183,714 lbs/hr input weight

2. Emission estimate is based on performance standards for new sulfuric acid plants. EPA Method 8 will be used to determine compliance.

3. Potential discharge is the actual emission.

4. Design details are discussed in attached report.

5. SO_2 Efficiency based on sulfur budget is as follows:

Total Sulfur input = 60,124 lbs/hr

Sulfur Emitted as SO_2 = 183 lbs/hr

$$\frac{183}{60124} \times 100 = 0.30\%$$

100% - 0.30% = 99.70% Efficiency

Acid Mist Efficiency is 99.99%

COUNTY OF HILLSBOROUGH

DER
OCT 1 1984
BAQM

MEMORANDUM

Date September 26, 1984

To Ed Palagyi, BAQM

From Steve Gyorog SG

Subject: Gardinier #7 and #8 Sulfuric Acid Plant Draft BACT

The draft BACT incorporates all of our concerns. We have no further comments.

No. 0157025

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED—
NOT FOR INTERNATIONAL MAIL
(See Reverse)

SENT TO
Mr. Rudy J. Cabina

STREET AND NO.

P.O., STATE AND ZIP CODE

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OPTIONAL SERVICES — SPECIAL DELIVERY		¢
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PS Form 3811, Jan. 1979

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2. ARTICLE ADDRESSED TO:
Mr. Rudy J. Cabina
P. O. Box 3269
Tampa, Florida 33601

3. ARTICLE DESCRIPTION:

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STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

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

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

September 26, 1984

Mr. Rudy J. Cabina
Vice President
Gardinier, Inc.
P. O. Box 3269
Tampa, Florida 33601

Dear Mr. Cabina:

The department acknowledges receipt of Gardinier's September 11, 1984, letter which provided the additional information we requested to complete your applications for permits to modify the numbers 7 and 8 sulfuric acid plants. The bureau has resumed processing these applications.

The information that was furnished showed the proposed production increase of each acid plant would result in significant net emissions increases of sulfur dioxide and acid mist. By federal regulations (40 CFR 60.14), each sulfuric acid plant will be (if not already) an affected facility and subject to the applicable Standards of Performance for New Stationary Sources. The allowable emission standards for the modified sulfuric acid plants will be established by a Best Available Control Technology (BACT) determination. These standards will be equivalent to, or more restrictive than, the standards listed in 40 CFR 60, Subpart H - Standards of Performance for Sulfuric Acid Plants.

Tentatively, the proposed modifications to the No. 7 sulfuric acid plant appear to comply with the air pollution control regulations and may be able to be approved. However, the proposed modifications to the No. 8 sulfuric acid plant cannot be approved unless additional modifications are made to the plant to lower the emissions to at least the standards listed in 40 CFR 60, Subpart H. It was stated in your September 11, 1984, letter that Gardinier, Inc. did not plan to modify the No. 8 sulfuric acid plant so that the emissions would meet the Standards listed in 40 CFR 60, Subpart H. If we have misunderstood Gardinier's position on the No. 8 plant, please contact us immediately.

If you have any questions on this matter or care to modify the application for the No. 8 sulfuric acid plant, please write to me or call Willard Hanks at (904)488-1344.

Sincerely,

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

CHF/WH/s

cc: Bill Thomas
Steve Gyorog

control devices or systems deemed necessary and ordered by the Department.

(2) Objectionable Odor Prohibited - No person shall cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor.

Specific Authority: 403.061, F.S. Law Implemented: 403.021, 403.031, 403.061, 403.087, F.S. History: Formerly 17-2.04(4) and (5), 17-2.05(4) and (5); Revised 1-18-72; Renumbered 1-3-78; Amended and Renumbered 11-1-81.

17-2.630 Best Available Control Technology (BACT).

(1) Determination.

Following receipt of a complete application for a permit to construct a source or facility which requires a determination of Best Available Control Technology, the Department shall make a determination of Best Available Control Technology. In making the BACT determination, the Department shall give consideration to:

(a) Any Environmental Protection Agency determination of Best Available Control Technology pursuant to Section 169, and any emission limitation contained in 40 CFR Part 60 (Standards of Performance for New Stationary Sources) or 40 CFR Part 61 (National Emission Standards for Hazardous Air Pollutants). The above references are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C., and may be inspected at the Department's Tallahassee office. In no event shall application of BACT result in emissions of any pollutant which would exceed the emissions allowed under 40 CFR Parts 60 or 61.

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

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

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

(2) Exceptions

(a) Any source which has received a written determination of Latest Reasonably Available Control Technology from the Department prior to the effective date of this Subsection shall be exempt from the requirements of Best Available Control Technology.

(b) Any pending petition or proceeding involving a determination of Latest Reasonably Available Control Technology (LRACT) in process on the effective date of this Subsection, and any construction permit application or construction permit proceeding relating to a category of sources encompassed by such proceeding shall be governed by the provisions of the LRACT rule, Chapter 17-2.02(30), and 17-2.03(1), Florida Administrative Code (Repealed).

(3) Phased Construction Projects - For phased construction projects, the determination of BACT shall be reviewed and modified as appropriate at the latest reasonable time not later than 18 months prior to commencement of construction of each independent phase of the project. At such time, the owner or operator of the facility may be required to demonstrate the adequacy of any previous determination of BACT.

(4) Use of Innovative Control Technology

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

INTEROFFICE MEMORANDUM

For Routing To District Offices And/Or To Other Than The Addressee		
To: _____	Loctn.: _____	
To: _____	Loctn.: _____	
To: _____	Loctn.: _____	
From: _____	Date: _____	
Reply Optional [ ]	Reply Required [ ]	Info. Only [ ]
Date Due: _____	Date Due: _____	

TO: Ed Palaygi, CAPS

THRU: Bill Thomas

FROM: Bob Garrett

DATE: September 24, 1984

SUBJECT: Comments on BACT for Gardinier's Sulfuric Acid Plants, 7 & 8

Page one, descriptions 75 and 179 lbs of SO_2/tons of H_2SO_4 appears excessive. Should this be lbs/hr.? We are in complete agreement with the BACT limits incorporating the NSPS Standards.

BG/BT/rw

Attachments

DER

SEP 27 1984

BAQM

GARDINIER INC.

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

September 11, 1984

Mr. Clair H. Fancy, P.E.
Deputy Chief, Bureau of Air Quality Management
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

DER
SEP 13 1984
BAQM

Dear Mr. Fancy:

The following information is supplied in response to your letter of July 27, 1984:

1. Section II.C. of the application states the converter and steam systems of the acid plants will be modified to increase production. Section 1.0 of Environmental Science and Engineering, Inc.'s attachment to the applications mentions changes to the drying tower, converter, and absorbing tower cooling systems. What are the current design capacities (acid production) of the absorbing towers and sulfuric acid mist eliminators? Please describe briefly all modifications to each of the acid plants that may be required to increase production to the proposed capacity and supply engineering design details that confirm this equipment can handle the proposed production rates.

DESCRIPTION OF NO. 7 ACID PLANT MODIFICATIONS:

A. The acid cross-circulating system between the Dry and Interpass Tower acid coolers and pump tanks will be changed from "Cold Side" cross flow to "Hot" cross flow. This would allow better acid temperature control of the absorbing tower at the higher production rates.

B. Mixing vanes in the gas duct at the second catalyst mass inlet will be added. This would provide better mixing of gas streams of three different temperatures and improve the performance of this mass.

C. Install a new separate pump to improve the flow of water from the existing cooling tower to the final absorbing tower cooler. This would increase the cooler's capacity.

DESCRIPTION OF NO. 8 ACID PLANT MODIFICATIONS:

A. Install the necessary gas ducting to permit parallel gas flows through the last two catalyst masses in the main converter. This would allow increased production by reducing the pressure drop (resistance to gas flow) throughout the system.

B. Install larger diameter export steam piping to handle the additional steam production from the plant.

ENGINEERING DESIGN DETAILS

Interpass Absorbing Tower

	Standard	No. 7 at 2200 STPD	No. 8 at 2200 STPD
Tower Diameter Ratio Sq.Ft./STPD	0.13	0.230	0.230
Packing Volume Ratio Cu.Ft./STPD	1.7	3.24	3.24
Mist Eliminator Area Ratio-Sq.Ft./STPD	.09	0.098	0.115
Final Absorbing Tower			
Tower Diameter Ratio Sq.Ft./STPD	.11	0.116	0.15
Tower Packing Volume Ratio Cu.Ft./STPD	1.6	1.67	2.3
Mist Eliminator Area Ratio-Sq.Ft./STPD	0.09	0.093	0.103

2. Please provide technical data to support your statement that the acid mist removal efficiencies for the two plants are 99.99 percent.

The removal efficiencies were based on the mist emitted as compared to the acid produced. It was not intended to represent the efficiency of the mist eliminators only.

3. Your answer to question 5 of the supplemental requirements for the No. 7 Acid Plant listed that 124 lb/hr of sulfur is emitted as sulfur dioxide. Is this number correct?

The number is a typographical error. The correct figure is 184.

4. Environmental Science and Engineering, Inc. attached two tables titled, "No. 7 Sulfuric Acid Plant Emission Tests". What are the bases for the average and maximum emissions listed in the tables? In three instances (Dec 9, 1977; Mar 7, 1979; and Oct 25, 1979) the emissions exceeded NSPS. Is the cause of these higher emissions known? Please provide a similar table of data and explanation for emissions in excess of NSPS for the No. 8 acid plant.

This is a typographical error. Page A-2 is incorrectly labled "#7 Sulfuric Acid Plant". It should be labeled "#8 Sulfuric Acid Plant". Also, Page A-3 should be labeled, "#9 Sulfric Acid Plant". Three runs are made with each stack test. The value shown as maximum is the highest of the three. The average is the average of the three. There were no emissions in excess of NSPS for #7 Sulfuric Acid Plant (Page A-1). #8 Sulfuric Acid Plant is an existing source and is not subject to NSPS. There were no violations of the State of Florida standards for existing sulfuric acid plants.

5. Please provide a copy of the document in which EPA concluded that BACT for a sulfuric acid plant is 10 lb SO2/T acid and 0.3 lb mist/T acid.

The statement is incorrect. The figures are limitations for an existing source by Chapter 17-2 FAC.

6. Why are the emissions from the No. 8 acid plant greater than those from the No. 7 Plant? Can the No. 8 plant be modified to meet the NSPS of 4 lb SO2/T acid and 0.15 lb mist/T acid? If so, what modifications will be needed and what is the approximate cost of these modifications?

Why are the emissions from the No. 8 Acid Plant greater than those from the No. 7 Plant?

No. 8 Plant has not undergone and is not planned to undergo the major modifications carried out at No. 7 Acid Plant.

Can the No. 8 Plant be modified to meet the NSPS of 4 lb SO2/T acid and 0.15 lb mist/T acid?

Yes, it could be.

If so, what modifications will be needed and what is the aproximate cost of these modifications?

The modifications required would be very extensive and would include a new boiler, new water and steam system, new blower and turbine, new catalyst, etc. The total cost would be in excess of $7mm (1984 dollars).

7. Will any phosphate plant (acid, DAP, GTSP, etc) have to be modified to increase its production up to its permitted capacity? If so, which plants will be modified and what modifications will be required?

No.

8. Please estimate the actual increases in particulate matter, sulfur dioxide and fluoride emissions from each phosphate plant due directly or indirectly to the use of the additional sulfuric acid that can be produced by the modified sulfuric acid plants.

There will be no increase in the daily maximum emissions as the downstream plants are operated at their maximum rates as long as acid is available. There could and probably will be an increase in the daily average rate.

This is not possible to quantify because of two factors; the additional sulfuric acid requirements could, as has occurred in the past, be purchased, and it is not possible to predict the end product split.

The attached report by ESE supplies responses to Questions 9 thru 13, inclusive. Supportive computer printouts are enclosed.

Please contact me if you have any questions.

Yours very truly,

G. E. Wilkinson

GEW:rw
Enclosure
cc: Mr. Rudy J. Cabina
Mr. A. E. Morrison

Comment 9

The listing of sources provided by DER as missing or incorrect is acknowledged and has been verified by Mr. Steve Gyororg of Hillsborough County Environmental Protection Commission. To investigate the effects of these sources on maximum predicted sulfur dioxide (SO_2) concentrations due to the proposed Gardinier H_2SO_4 plant expansion, Environmental Science and Engineering, Inc. (ESE) performed additional air dispersion modeling. The Industrial Source Complex (ISC) Model was used, with model assumptions identical to those used in the previous modeling analysis (ESE report dated January 13, 1984).

The source inventory consisted of the original source inventory (January 1984 report) modified to account for the new/revised sources. The worst-case days identified from the previous analysis were rerun with the revised inventory. Only the receptor grids around Gardinier (north, south, east-west) were considered because the previous analysis showed that Gardinier did not contribute significantly to maximum concentrations predicted for other receptor grids (see Table 5-5 of January 1984 report).

In addition, only receptors located at or off of plant property were considered. The results of revised SO_2 modeling analysis are shown in Tables 1 and 2. As shown, the highest, second-highest 3-hour SO_2 concentration increased slightly from 901 ug/m^3 to 915 ug/m^3. The revised maximum concentration is still well below the Florida ambient air quality standard (AAQS) of 1,300 ug/m^3. The maximum predicted 24-hour SO_2 concentration did not increase above the 249-ug/m^3 level predicted previously. However, a 249-ug/m^3 level is now also predicted for the south grid.

Comment 10

A map locating the Gardinier plant property boundaries is provided under the response to Comment 11. The Gardinier plant is surrounded on two

Table 1. Revised Maximum 3-Hour Average SO_2 Concentrations for Comparison to AAQS--Receptors Around Gardinier

Receptor Grid Location	Value	Concentration (ug/m^3) Total	Contribution From: Gardinier Sources	Other Modeled Sources	Background	Receptor Location UTM Coordinates (km) X	Y	Period: Julian Day	Hour Ending	Year
Previous Modeling										
North	H2H	901	456	430	15	363.5	3083.4	158	18	1978
Revised Modeling										
North	H	972	396	561	15	363.5	3083.4	160	9	1978
	H2H	915	456	444	15	363.5	3083.4	158	18	1978
South	H	786	771	0	15	362.8	3081.8	235	15	1978
	H2H	750	735	0	15	362.8	3081.8	257	15	1978
East-West	H	1062	298	749	15	363.6	3083.6	82	12	1975
	H2H	843	565	263	15	363.6	3083.6	66	12	1975

Note: H = Highest concentration.
H2H = Highest, second-highest.

Source: ESE, 1984.

Table 2. Revised Maximum 24-Hour Average SO_2 Concentrations for Comparison to AAQS--Receptors Around Gardinier

Receptor Grid Location	Value	Concentration (ug/m^3) Total	Contribution From Gardinier Sources	Contribution From Other Modeled Sources	Contribution From Background	Receptor Location UTM Coordinates (km) X	Receptor Location UTM Coordinates (km) Y	Period Julian Day	Period Year
Previous Modeling									
North	H2H	249	234	0	15	362.0	3083.1	127	1979
Revised Modeling									
North	H	272	257	0	15	362.0	3083.1	263	1979
	H2H	249	234	0	15	362.0	3083.1	127	1979
South	H	251	104	132	15	364.35	3081.1	58	1973
	H2H	249	127	107	15	364.35	3081.1	351	1973
East-West	H	236	221	0	15	362.0	3082.4	253	1979
	H2H	234	219	0	15	362.0	3082.4	254	1979

Note: H = Highest concentration.
H2H = Highest, second-highest concentration.

Source: ESE, 1984.

sides by water. To the north is located the Gypsum stack, which is precluded from public access. To the northeast and east, the plant is bounded by U.S. 41 and railroad tracks, providing an effective barrier against public access.

The location and magnitude of maximum ground-level SO_2 concentrations without regard to plant boundaries was determined by performing additional dispersion modeling. Receptor locations are shown in the map under the response to Comment 11. A 5-year screening analysis was performed using all sources from the revised SO_2 inventory with annual emissions exceeding 250 tons per year. The results of these analyses are presented in Tables 3, 4 and 5.

Table 3 shows maximum predicted on-plant property 3-hour SO_2 concentrations. Of concern is whether the 3-hour AAQS of 1,300 ug/m^3, not to be exceeded more than once per year, is predicted to be violated. The highest (H) and highest, second-highest (H2H) concentrations occurring in 1975 were both due to the occurrence of calm winds. The next valid H concentration was 871 ug/m^3 in 1975. The other years in which the 1,000-ug/m^3 level was exceeded were: the H2H in 1974 of 1,107 ug/m^3 was due to calm winds; the H2H in 1978 of 1,189 ug/m^3 was due to calm winds. This analysis demonstrates that maximum predicted (unrefined) 3-hour SO_2 impacts on plant property are below 1,189 ug/m^3, and well below the 1,300-ug/m^3 AAQS.

Table 4 shows a similar analysis for the 24-hour averaging time. The H and H2H levels predicted in any year (351 and 326 ug/m^3 in 1978) were both due to calms in the meteorological data base. The next highest H2H value is 227 ug/m^3 (1975) and is well below the 24-hour AAQS of 260 ug/m^3.

Table 3. Maximum 3-Hour Average SO_2 Concentrations for Receptors Located on Plant Property

Year	Value	Concentration (ug/m^3) Total	Contribution From: Modeled Sources	Contribution From: Background	Receptor Location UTM Coordinates (km) X	Receptor Location UTM Coordinates (km) Y	Period: Julian Day	Period: Hour Ending	Comments
1973	H	931	916	15	363.1	3082.9	37	8	No check for calms
	H2H	867	852	15			346	7	No check for calms
1974	H	1,146	1,131	15	362.4	3083.6	69	1	No check for calms
	H2H	1,107	1,092	15			162	8	Due to calms
1975	H	1,659	1,644	15	362.4	3083.6	165	1	Due to calms
	H2H	1,491	1,476	15			300	1	Due to calms
	H	871	856	15			82	4	Valid
1978	H	1,266	1,251	15	362.4	3083.6	119	1	Due to calms
	H2H	1,189	1,172	15			161	1	Due to calms
1979	H	914	899	15	362.5	3082.9	235	4	Valid
	H2H	819	804	15			276	8	Due to calms

Note: H = Highest concentration.
H2H = Highest, second-highest concentration.

Source: ESE, 1984.

Table 4. Maximum 24-Hour Average SO_2 Concentrations for Receptors Located on Plant Property

Year	Value	Concentration (ug/m^3) Total	Contribution From: Modeled Sources	Contribution From: Background	Receptor Location UTM Coordinates (km) X	Receptor Location UTM Coordinates (km) Y	Julian Day	Comments
1973	H	210	195	15	362.1	3083.2	359	Not checked for calms
	H2H	202	187	15			88	Not checked for calms
1974	H	195	190	15	362.95	3083.2	106	Not checked for calms
	H2H	191	176	15			40	Not checked for calms
1975	H	387	372	15	362.4	3083.6	165	Not checked for calms
	H2H	227	212	15			300	Not checked for calms
1978	H	351	336	15	362.4	3083.6	119	Due to calms
	H2H	326	311	15			63	Due to calms
	H	241	226	15	362.3	3082.6	171	Valid
	H2H	233	218	15			114	Valid
1979	H	248	233	15	362.3	3082.6	262	Not checked for calms
	H2H	226	211	14			176	Not checked for calms

Note: H = Highest concentration.
H2H = Highest, second-highest concentration.

Source: ESE, 1984.

Table 5. Maximum Annual Average SO_2 Concentrations for Receptors Located on Plant Property

Year	Concentration (ug/m^3)			Receptor Location		Comments
		Contribution From		UTM Coordinates (km)		
	Total	Modeled Sources	Background	X	Y	
1973	54	39	15	362.2	3082.9	Includes contribution due to calms
1974	54	39	15	362.3	3082.6	Includes contribution due to calms
1975	61	46	15	362.3	3082.6	Includes contribution due to calms
1978	64	49	15	362.4	3082.2	Includes contribution due to calms
1979	60	45	15	362.3	3082.6	Includes contribution due to calms

Source: ESE, 1984.

Maximum annual average SO_2 impacts on plant property are shown in Table 5. The maximum value of 64 ug/m^3 slightly exceeds the annual AAQS of 60 ug/m^3, but the predicted value includes the effects of calm wind conditions on the concentration estimates. This maximum also occurs well within plant property boundaries.

Comment 11

See attached working maps for receptor sites in the vicinity of Gardinier (north, south, and east-west grids) and TEC Big Bend. A table of receptor locations is provided for northern receptors which clearly defines distance and direction from Gardinier.

Comment 12

Working maps are provided in response to this comment.

Comment 13

Additional dispersion modeling was conducted in order to assess the impact of the proposed modification upon the Pinellas County SO_2 nonattainment area. A 5-year ISC model execution was performed, using only the increase in allowable SO_2 emissions from the Gardinier H_2SO_4 Plants 7 and 8. Stack parameters were assumed to be the same for before and after the modification. This assumption is conservative since the stack flows are based upon the higher production rate and allowable emissions, and therefore would tend to underpredict baseline impacts and overpredict the increase in air quality impacts. Because of the distance to the nonattainment area from Gardinier, a single receptor paint was used in the analysis (329.0, 3112.0). The results of the analysis are summarized in Table 6.

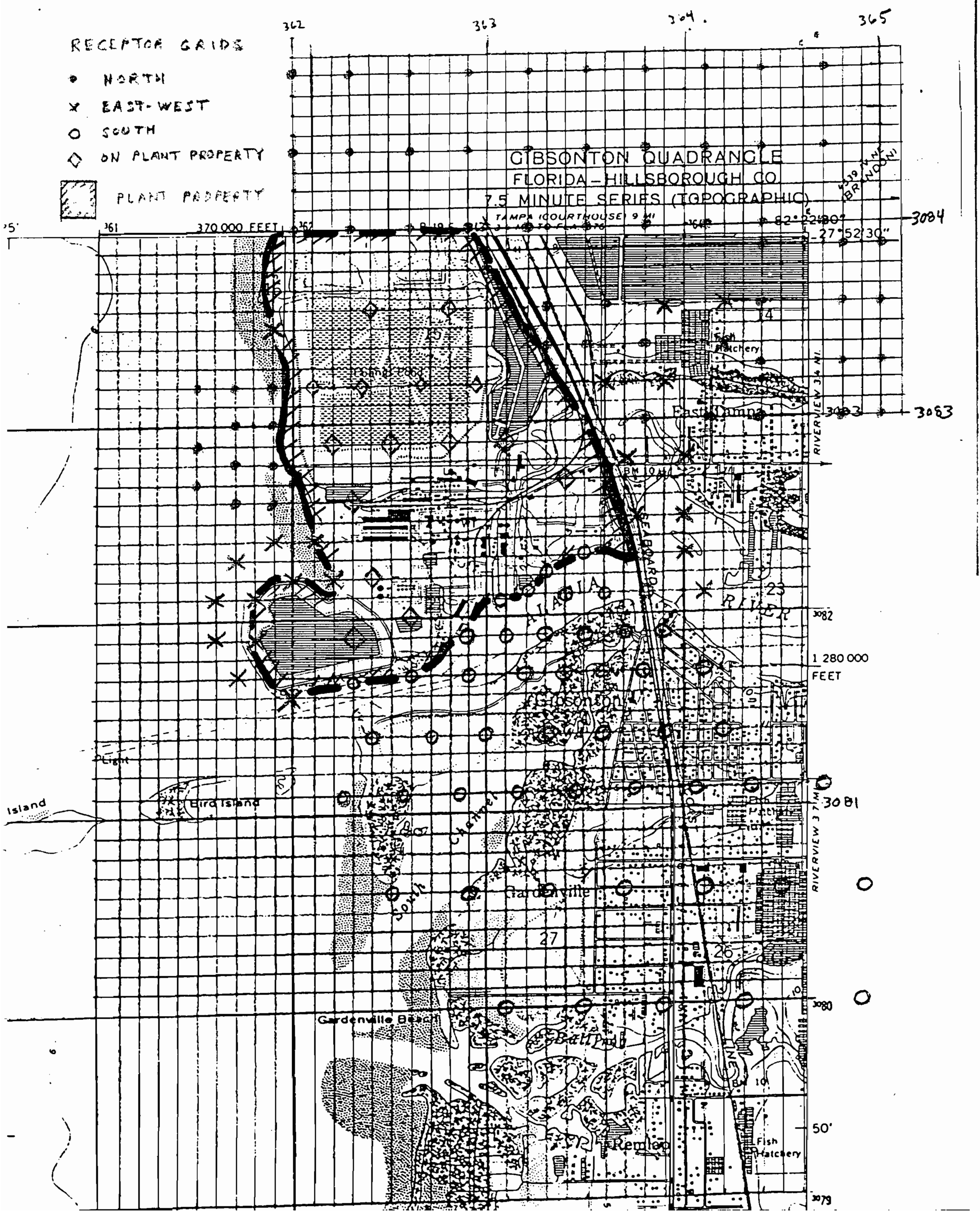
As shown, the predicted increase in SO_2 concentrations in the nonattainment area due to the proposed modification are less than significance levels. The significance levels are 1, 5, and 25 ug/m^3 for the annual, 24-hour, and 3-hour averaging times, respectively.

Table 6. Maximum SO_2 Concentrations Predicted for the SO_2 Nonattainment Area

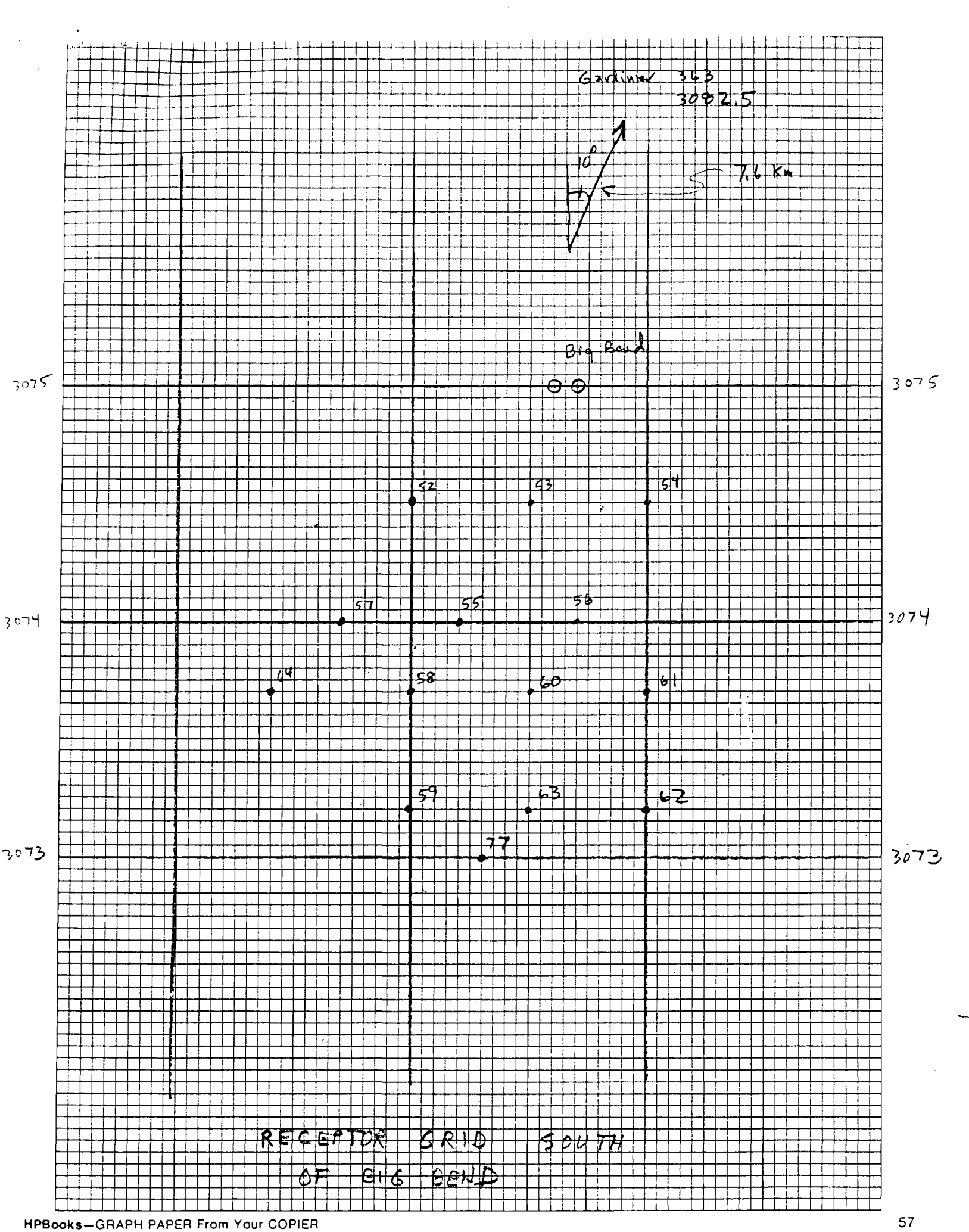
Averaging Time	Value	Increase in Concentration (ug/m)	Period		
			Julian Day	Hour Ending	Year
Annual	H	0.1	--	--	All
24-Hour	H	3.2	15	24	1973
	H2H	3.1	253	24	1973
3-Hour	H	17	253	6	1973
	H2H	15	15	6	1973

Note: H = Highest concentration.
H2H = Highest, second-highest concentration.

Source: ESE, 1984.



RECEPTOR GRIDS
NORTH
EAST-WEST
SOUTH
ON PLANT PROPERTY
PLANT PROPERTY
362
363
364
365
GIBSONTON QUADRANGLE
FLORIDA-HILLSBOROUGH CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
TAMPA (COURTHOUSE) 9 MI
370 000 FEET
27°52'30"
3084
3083
3082
3081
3080
3079
1 280 000
FEET
50'
Fish
Hatchery
East Tampa
RIVERVIEW 3.4 MI.
RIVERVIEW 3.7 MI.
Gibsonton
Gardenville
Gardenville Beach
Bird Island
Island
Light
Remlec
Bullfrog
SEABOARD
RIVER
27
26
23
14


Gardiner 353
3082.5
10°
7.6 Km
Big Band
3075
3074
3073
52
53
54
57
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64
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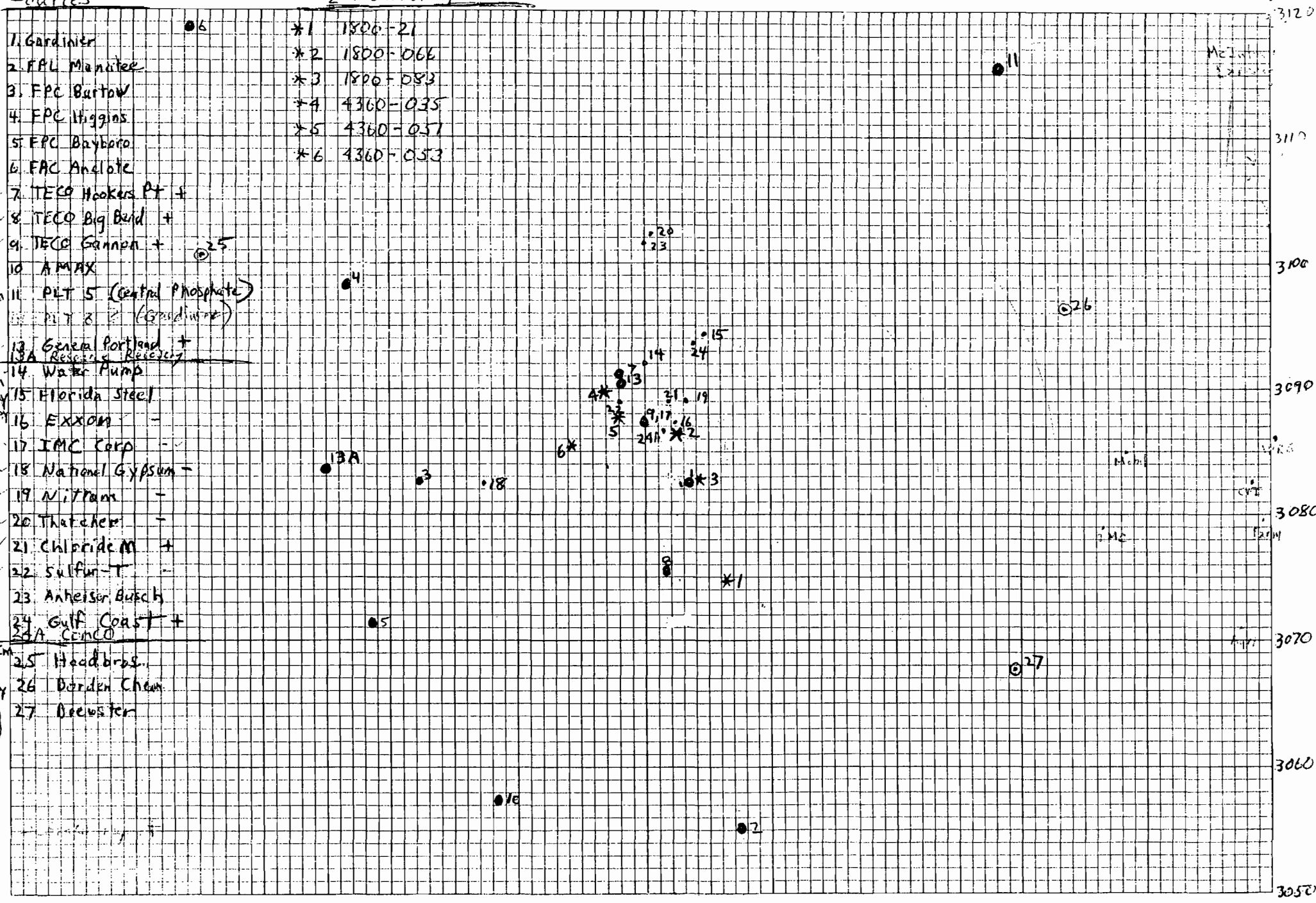
61
59
63
62
77
RECEPTOR GRID SOUTH
OF BIG BAND



LOCATION SO_2 SOURCES AND AMBIENT MONITORING SITES

ESE
P. O. Box ESE
GAINESVILLE, FL 32602
(904) 332-3318

JOB

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

RECEPTOR GRID NORTH OF INTERACTION SOURCES

		(Src No. on Map)			Direction from Sandmier	Distance (km)
6	Sandmier		363	3082.5		
2	Chloride Metals	(21)	361.8	3088.3	348	5.9
3	TECO HP	(7)	358.0	3091.0	330	9.9
5	TECO Gannon	(9)	360.0	3087.5	329	5.8
1	Gen Portland	(13)	358.0	3090.6	328	9.5
2	Gulf Coast	(24)	363.9	3093.8	5	11.3

18

Receptors - north of Interaction Sources

Source	Receptors	Downwind Distance from source		Source Location	
Gannon	359.74, 3087.93	from Gannon	0.5	360.0	3087.5
	359.48, 3088.02		1.0		
	358.29, 3088.53		2.0		
TECO HP, GenPort	357.75, 3091.43	from HP	0.5	358	3091
	357.50, 3091.87		1.0		
	357.0, 3092.73		2.0		
Chloride Metals	361.7, 3088.79	from Chlor Metals	0.5	361.8	3088.3
	361.59, 3089.28		1.0		
	361.38, 3090.26		2.0		
Gulf Coast	363.94, 3094.3		0.5	363.9	3093.8
	363.99, 3094.8		1.0		
	364.07 3095.79		2.0		

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

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

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

July 27, 1984

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. A. E. Morrison
Manager, Environmental Services
Gardinier, Inc.
P. O. Box 3269
Tampa, Florida 33601

Dear Mr. Morrison:

The Department has made a preliminary review of your applications for permits to increase production in Gardinier's Nos. 7 and 8 sulfuric acid plants. Before these applications can be processed, the Department will need the information being requested below.

1. Section II.C. of the application states the converter and steam systems of the acid plants will be modified to increase production. Section 1.0 of Environmental Science and Engineering, Inc.'s attachment to the applications mentions changes to the drying tower, converter, and absorbing tower cooling systems. What are the current design capacities (acid production) of the absorbing towers and sulfuric acid mist eliminators? Please describe briefly all modifications to each of the acid plants that may be required to increase production to the proposed capacity and supply engineering design details that confirm this equipment can handle the proposed production rates.

2. Please provide technical data to support your statement that the acid mist removal efficiences for the two plants is 99.99 percent.

3. Your answer to question 5 of the supplemental requirements for the No. 7 acid plant listed that 124 lb/hr of sulfur is emitted as sulfur dioxide. Is this number correct?

4. Environmental Science and Engineering, Inc. attached two tables titled No. 7 Sulfuric Acid Plant Emission Tests. What are the basis for the average and maximum emissions listed in the tables? In three instances (Dec. 9, 1977,

March 7, 1979 and Oct. 25, 1979), the emissions exceeded NSPS. Is the cause of these higher emissions known? Please provide a similar table of data and explanation for emissions in excess of NSPS for the No. 8 acid plant.

5. Please provide a copy of the document in which EPA concluded that BACT for a sulfuric acid plant is 10 lb SO_2/T acid and 0.3 lb mist/T acid.

6. Why are the emissions from the No. 8 acid plant greater than those from the No. 7 plant? Can the No. 8 plant be modified to meet the NSPS of 4 lb SO_2/T acid and 0.15 lb mist/T acid? If so, what modifications will be needed and what is the approximiate cost of these modifications?

7. Will any phosphate plant (acid, DAP, GTSP, etc.) have to be modified to increase its production up to its permitted capacity? If so, which plants will be modified and what modifications will be required?

8. Please estimate the actual increases in particulate matter, sulfur dioxide, and fluoride emissions from each phosphate plants due directly or indirectly to the use of the additional sulfuric acid that can be produced by the modified sulfuric acid plants.

9. The following sources were not considered in the modeling analysis:

Source	SO_2(g/s)	H(m)	T(K)	D(m)	V(m/s)	UTME	UTMN
Columbia Paving	3.7	12.2		1.2	22.2	366.8	3077.8
Couch Constr.	3.3	10.4		1.4	14.4	364.4	3098.1
Columbus Co.	4.8	12.6		1.3	20.2	362.1	3096.7
McKay Bay RRF	21.4	50		1.8	18.3	360.3	3092.3
General Portland 18-06	349.1	61.0		4.7	9.1	358.0	3090.6

The following sources were listed but with different allowable emissions than were used in the analysis.

Source	SO_2 (g/s)
Gulf Coast Lead	47.2
Big Bend Unit 4	655.3
IMC (24-01)	41.5

The following sources were listed but are no longer operational or permitted.

Source

Tampa Water Pump
9-01
9-02

General Portland
18-04
18-05

All of these changes should be made in corrective modeling or an explanation of why each of these sources will not significantly alter the previous modeling should be made.

10. In that the maximum predicted concentrations are often occurring at the plant property line, please provide a map locating the plant boundary. Also, justify the use of the plant boundary restriction by proving that the general public is precluded from access inside this boundary by a physical barrier.

    Determine the location and magnitude of the maximum ground-level concentrations without regard to any plant boundary. If the predicted concentrations exceed ambient standards or increments, then allowance can be made for the plant boundary provided it can be demonstrated that the boundary constitutes a physical barrier.

11. Provide a map locating the receptor sites used in the modeling analysis.

12. Provide a map locating the six SO_2 monitoring sites in relation to nearby sources.

13. An analysis of the ambient impact on the SO_2 nonattainment area located in Pinellas county by sources within the area of influence should be made until such time as this area is officially designated attainment.

If you have any questions on the information needed to complete your applications, please write me or call Willard Hanks on questions 1-8 and Tom Rogers on questions 9-13 at (904)488-1344. We will resume processing your applications when the information requested above is submitted.

Sincerely,

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

CHF/WH/s

cc: SW District
Hillsborough County EPC

LANT 0008 GARDINIER INC TAMPA FL **Best Available Copy** PRIVATE FILE STATUS NEW ADD
U.S. HWY 41. OTHER
TAMPA FL. 33601
R J CABINA AQCR=052 SIC=1475
P O BOX 3269 LAT=27:51:28N LON=82:23:15W
TAMPA FL. 33601 UTM ZONE 17 362.9EAST 3082.5NORTH

POINT 05 CONST PATS# OPER PATS# A029-18228
ISS= / / EXP= / / ISS=04/26/79 EXP=04/15/84
SULFURIC ACID PLANT NO. 8
SOURCE= IPP=00 EXIST NSPS 155 COMM.PNTS. 113,790
STACK HT= 150FT DIAM= 8.0FT TEMP= ~~161~~F FLOW= ~~42000~~CFM PLUME= 0FT
BOILER CAP= 0MBTU/HR FUEL FOR SPACE HEAT= 0.0%
OPERATING PROCESS RATES YOR=~~79~~83 RAW MATERIAL= 19.7 ~~28~~ TN/PRC
PRODUCT 60.1 ~~24~~ TN/PRC FUEL 0 OTHER
NORMAL COND. DEC-FEB=25% MAR-MAY=25% JUN-AUG=25% SEP-NOV=25%
3/23/84 PERMIT SCHEDULE 24HRS/DAY 7DAYS/WK 52WKS/YR
AOR FOR ~~03/07/79~~ 24HRS/DAY 7DAYS/WK 52WKS/YR
EXCESS HEAT USED TO PROCESS PHOS ACID
COMPLIANCE NEDS=1 QRC=2 UPDATE= / SCHED= / UPDATED= / /
PERMIT=1 YOR=~~79~~ 84 INSPECTED=~~06/01/79~~ NEXT DUE= ~~12/18/79~~

*SCC'S 3-01-023-08 YOR: 83 SOURCE: P RATE: 138491 MAX: 30.2 CONFID: 2

POLLUTANTS MONITORED 044 014 99.9

VE 11204 NORM. EST/METH. / MAX.ALW. TNS/YR.
CTLS. PRI=000 SEC=000 EFF=~~00.0%~~ NEXT DUE ~~07/30/84~~ TEST/FREQ=6
TESTED 11/15/83 AGENCY=3 REG=2.600(2)(a)2. COMPLIANCE=1
EMITTED 600.00 ALLOWED= ~~600.20LBS/HR~~ 60010 OP-RATE= 70TN/PRD

S-A 12604 NORM. 13.8 EST/METH. 9.6 / 1 MAX.ALW. 100.5 TNS/YR.
CTLS. PRI=044 SEC=014 EFF=99.9% NEXT DUE 07/30/84 TEST/FREQ=6
TESTED 11/15/83 AGENCY=3 REG=2.600(2)(a)2. COMPLIANCE=1
EMITTED 2.73 ALLOWED= ~~10.70~~ 21.15 LBS/HR OP-RATE= 70TN/PRD

SO2 42401 NORM. ~~730.00~~ 366.7 EST/METH. 629 ~~1195~~/1 MAX.ALW. ~~2947~~ 1606 TNS/YR.
CTLS. PRI=044 SEC=014 EFF=99.9% NEXT DUE 07/30/84 TEST/FREQ=6
TESTED 11/15/83 AGENCY=3 REG=~~.0546/1011~~ COMPLIANCE=1
EMITTED 137.50 ALLOWED= 280.00LBS/HR OP-RATE= 70TN/PRD
2.600(2)(a)2.

SCC COMMENTS: NO FUEL FOR THIS OPERATION; MAX BASED ON SULFUR

To: Willard Hanks, BAQM

Re: Gardinier #7 & #8
Sulfuric Acid Plant PER
updates

AUG 01 1984

From: Steve Gyorog BAQM
Hillsborough County EPC

LANT 0008 GARDINIER INC TAMPA FL PRIVATE FILE STATUS NEW ADD
U.S. HWY 41 OTHER
TAMPA FL. 33601
R J CABINA AQCR=052 SIC=1475
P O BOX 3269 LAT=27:51:28N LON=82:23:15W
TAMPA FL. 33601 UTM ZONE 17 362.9EAST 3082.5NORTH

POINT 04 CONST PATS# OPER PATS# ~~A029 30993~~
ISS= / / EXP= / / ISS=~~09/10/83~~ EXP=~~84/19/89~~
NO. 7 SULFURIC ACID PLANT
SOURCE= IPP=02 ~~NEW~~ NSPS 149 COMM.PNTS. - 113,925 CFM
STACK HT= 150FT DIAM= 7.5FT TEMP= ~~150~~F FLOW= ~~78700~~CFM PLUME= OFT
BOILER CAP= OMBTU/HR FUEL FOR SPACE HEAT= 0.0%
OPERATING PROCESS RATES YOR=~~83~~ RAW MATERIAL= 80.9 ~~66~~ TN/PRC
PRODUCT 63.9 ~~66~~ TN/PRD FUEL 0 OTHER
NORMAL COND. DEC-FEB=25% MAR-MAY=25% JUN-AUG=25% SEP-NOV=25%
PERMIT SCHEDULE 24HRS/DAY 7DAYS/WK 52WKS/YR
AOR FOR ~~84/15/89~~ 03/23/84 22HRS/DAY 7DAYS/WK 50WKS/YR
COMPLIANCE NEDS=1 QRC=2 UPDATE= / SCHED= / UPDATED= / /
PERMIT=1 YOR=83 INSPECTED=~~11/10/77~~ NEXT DUE= ~~12/00/00~~
POINT COMMENTS: RAW MATERIAL RATE IS ESTABLISHED AS SULFUR

SCC'S

3-01-023-01 YOR=~~77~~ SOURCE=P RATE= 383800 MAX= ~~46~~ 83 TN/PRD
FUEL CONT SO2=0.00% ASH=00.0% MBTU YOR=79 CONFID=2

3-01-023-~~00~~ 08 YOR=83 SOURCE=P RATE= ~~41352~~ 160303 MAX= ~~43.700~~ 30.0 B2
FUEL CONT SO2=0.00% ASH=00.0% MBTU YOR= CONFID=2
SCC COMMENTS: NO FUEL FOR THIS OPERATION; MAX BASED ON SULFUR

POLLUTANTS MONITORED

~~TSP~~ 11101 NORM. 0.00 EST/METH. 541 MAX.ALW. TNS/YR.
CTLS. PRI=015 SEC=000 EFF=90.0% NEXT DUE ~~10/20/78~~ TEST/FREQ=
TESTED 04/19/78 AGENCY= REG= COMPLIANCE=
EMITTED 0.00 ALLOWED= 0.00 LBS/HR OP-RATE= OTHER

VE 11204 NORM. 044 EST/METH. 014 / MAX.ALW. TNS/YR.
CTLS. PRI=~~015~~ SEC=~~000~~ EFF=99.9% NEXT DUE ~~10/30/84~~ TEST/FREQ=~~4~~ 6
TESTED 11/10/83 AGENCY=3 REG= COMPLIANCE=1
EMITTED 300.00 ALLOWED= ~~600.20~~ LBS/HR OP-RATE= 82TN/PRD

S-A 12604 NORM. ~~14.00~~ 13.8 EST/METH. 300 10 21.1 12/0 3 MAX.ALW. 60.226 TNS/YR.
044 CTLS. PRI=~~015~~ SEC=~~000~~ EFF=99.9% NEXT DUE ~~10/30/84~~ TEST/FREQ=6
014 TESTED ~~11/10/83~~ AGENCY=3 REG=~~05(6)B1B~~ COMPLIANCE=1
EMITTED 4.98 ALLOWED= 12.36 LBS/HR OP-RATE= 82.4 ~~84~~ TN/PRD

SO2 42401 NORM. 367 ~~41.00~~ EST/METH. 014 269/3 ~~21.0~~ MAX.ALW. 1606 ~~1913~~ TNS/YR.
CTLS. PRI=044 SEC=~~000~~ EFF=99.9% NEXT DUE ~~10/30/84~~ TEST/FREQ=6
TESTED 11/10/83 AGENCY=3 REG=.05(6)B1B COMPLIANCE=1
EMITTED 242.26 ALLOWED= 329.60 LBS/HR OP-RATE= 82TN/PRD

No. 0156534

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED—
NOT FOR INTERNATIONAL MAIL
(See Reverse)

SENT TO
Mr. A. E. Morrison

STREET AND NO.

P.O., STATE AND ZIP CODE

POSTAGE		$
CONSULT POSTMASTER FOR FEES	CERTIFIED FEE	¢
OPTIONAL SERVICES	SPECIAL DELIVERY	¢
OPTIONAL SERVICES	RESTRICTED DELIVERY	¢
OPTIONAL SERVICES — RETURN RECEIPT SERVICE	SHOW TO WHOM AND DATE DELIVERED	¢
OPTIONAL SERVICES — RETURN RECEIPT SERVICE	SHOW TO WHOM, DATE, AND ADDRESS OF DELIVERY	¢
OPTIONAL SERVICES — RETURN RECEIPT SERVICE	SHOW TO WHOM AND DATE DELIVERED WITH RESTRICTED DELIVERY	¢
OPTIONAL SERVICES — RETURN RECEIPT SERVICE	SHOW TO WHOM, DATE AND ADDRESS OF DELIVERY WITH RESTRICTED DELIVERY	¢
TOTAL POSTAGE AND FEES		$

POSTMARK OR DATE

7/31/84

PS Form 3800, Apr. 1976

PS Form 3811, Jan. 1979

SENDER: Complete items 1, 2, and 3.
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  Show to whom and date delivered.....¢
- ☑ RESTRICTED DELIVERY.
  Show to whom, date, and address of delivery.$

(CONSULT POSTMASTER FOR FEES)

2. ARTICLE ADDRESSED TO:
Mr. A. E. Morrison
P. O. Box 3269
Tampa, Florida 33601

3. ARTICLE DESCRIPTION:

REGISTERED NO.	CERTIFIED NO.	INSURED NO.
	0156534	

(Always obtain signature of addressee or agent)

I have received the article described above.
SIGNATURE ☐ Addressee ☐ Authorized agent

4. DATE OF DELIVERY AUG - 6 1984 POSTMARK AUG 6 1984 TAMPA, FLA. DOWNTOWN STA. USPO

5. ADDRESS (Complete only if requested)

6. UNABLE TO DELIVER BECAUSE: CLERK'S INITIALS

RETURN RECEIPT, REGISTERED, INSURED AND CERTIFIED MAIL

☆GPO : 1979-300-459

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

INTEROFFICE MEMORANDUM

For Routing To District Offices And/Or To Other Than The Addressee

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

Reply Optional [ ] Reply Required [ ] Info. Only [ ]
Date Due: _____ Date Due: _____

TO: Clair Fancy

FROM: Bob Garrett RRG

THRU: Bill Thomas

DATE: July 19, 1984

DER
JUL 23 1984
BAQM

SUBJECT: Review comments for Gardinier Sulfuric Acid Plants 7 and 8 Expansion Request

Gardinier has applied to CAPS for a construct modification to their sulfuric acid plants 7 and 8, increasing production 880 tons/day or 15% over present total production.

1. Our question, as with Royster and USSAC, is what will the extra acid be utilized for? Will this cause an increase in phosphoric acid, DAP and/or GTSP production here at this facility?

2. An error presently exists in para 2.3.2 and is repeated throughout the ESE report concerning the acid mist allowable of 0.3 lbs/ton acid. The previous operating permit allowed 0.3 lbs acid mist per ton of acid produced. A recent permit AO29-84015, Sulfuric Acid Plant No. 8, was issued with a limit of 0.15 lbs/ton. Gardinier has put in a formal request to increase this to the 0.3 level. If the District does not honor this request, the environmental increase calculated by ESE will change and be a greater amount. We feel as probably you do, that it is time to bring this plant in line with NSPS limits.

3. We note that the 24 hour maximum concentration of SO_2 near their plant is 249 $\mu G/M^3$ or extremely close to the standard of 260 $\mu G/M^3$ of which Gardinier is a 94% contributor. Also the annual maximum is 58.4 where 60 $\mu G/M^3$ is the AAQS! Here they contribute 50% as predicted by model. This is a strong point in insisting on NSPS of 4 lbs/ton instead of 10 lbs/ton of 100% sulfuric acid.

4. Perhaps HCEPC will pick up the 10% opacity allowed in para 6.3. They have a rule of 5% maximum allowable visible emissions.

RRG/rbh

DEPARTMENT OF ENVIRONMENTAL REGULATION

ROUTING AND TRANSMITTAL SLIP

ACTION NO.

ACTION DUE DATE

	INITIAL	DATE
1. TO: (NAME, OFFICE, LOCATION) Clair Fancy		
2. DER - Tallahassee		
3. ~~Bill Horn~~ Bill Thomas		
4. Willard		

REMARKS:

I would like to know what Willard thinks about this.

Clair

(1) Gardinier said extra acid used to increase phosphate fertilizer production to their permitted limit.

(2) Don't know the plant's allowable limits but plan to permit at NSPS.

(3) Tom Rogers requested additional information in the "incompleteness" letter to review model.

(4) MAY HAVE TO GIVE PLANTS 5% opacity (instead of NSPS of 10%) because of HCPC Rule.

INFORMATION	
	REVIEW & RETURN
	REVIEW & FILE
	INITIAL & FORWARD
DISPOSITION	
	REVIEW & RESPOND
	PREPARE RESPONSE
	FOR MY SIGNATURE
	FOR YOUR SIGNATURE
	LET'S DISCUSS
	SET UP MEETING
	INVESTIGATE & REPT
	INITIAL & FORWARD
	DISTRIBUTE
	CONCURRENCE
	FOR PROCESSING
	INITIAL & RETURN

FROM: Bob Garrett

DATE 7-2068

PHONE

Not I/C Questions,

COUNTY OF HILLSBOROUGH

Need review when drafting permits

DER
JUL 19 1984
BAQM

MEMORANDUM

Date July 16, 1984

To Willard Hanks, BAQM

From Steve Gyorog, HCEPC SG

Subject: Modification To Gardinier's #7 and #8 Sulfuric Acid Plants

The #7 and #8 Sulfuric Acid Plants are currently undergoing modification to boost production. Each plant will produce 183,333 lb/hr of 99% sulfuric acid. Having inspected the sources and reviewed the applications, I recommend the issuance of two five month construction permits subject to the following specific conditions:

1. The maximum feed rate of sulfur to the burner shall be 60,124 lb/hr for the #7 Plant and 60,404 lb/hr for the #8 Plant.

2. Sulfur dioxide emissions shall not exceed 4 lbs/ton of 100% H_2SO_4 produced as per 40 CFR 60.82.

3. Sulfuric acid mist emissions shall not exceed 0.15 lb/ton of 100% H_2SO_4 produced as per 40CFR60.83.

4. Visible emissions shall not exceed 5% opacity as per Chapter 1-3.03 VI. C., except for 30 minute periods during plant startup when opacity shall be no greater than 40%.

5. The compliance test shall consist of the following methods and practices listed in 40CFR60.85:

   a. Method 1 for sample and velocity traverses;
   b. Method 2 for velocity and volumetric flow rate;
   c. Method 3 for gas analysis.
   d. Method 8 for the concentrations of SO_2 and acid mist;
      1. The minimum sampling time and sample volume for each Method 8 run shall be 60 minutes and 40.6 dscf. Other sampling times and sample volumes as necessitated by process variables may be approved by the HCEPC.
   e. During each testing period, the rate of acid produced shall be determined by a suitable method and confirmed by a material balance over the production system. The production rate shall be expressed in tons per hour of 100% H_2SO_4.
   f. The emission rates shall be determined by multiplying the volumetric flow rate calculated by EPA Method 2 and the acid mist and SO_2 concentrations calculated by EPA Method 8. Consistent units shall be used.

6. Emission monitoring shall consist of the following practices listed in 40CFR60.84:
   a. Sulfur dioxide emissions shall be monitored continuously.
   b. Performance evaluation of the monitoring system shall be conducted using the SO_2 portion of the Method 8 results.
   c. Monitored data shall be made available to the DER or the HCEPC upon request.
   d. Gardinier shall establish a conversion factor for the purpose of converting monitoring data into units of the applicable standard.
      1. The conversion factor shall be determined, as a minimum, three times daily by measuring the sulfur dioxide concentration of the gas entering the converter. The Reich test may be used.
      2. The calculated conversion factors shall be recorded and the yearly average transmitted to the HCEPC on the Annual Operating Report.

7. Gardinier shall take precautionary measures to prevent excess emissions in the form of leaks.

8. All construction on the plants shall be completed by March 1, 1985, unless the HCEPC is notified for an extension review.

9. Upon completion of construction and within 30 days of startup, compliance test results and a Certificate of Completion of Construction shall be submitted to the HCEPC.

If you have any questions or comments, please call me.

sw/4-A23

cc:
Bob Garrett/Bill Thomas, DER

File Copy

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

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

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

December 13, 1984

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Mr. Rudy J. Cabina, Vice President
Gardinier, Inc.
P.O. Box 3269
Tampa, Florida 33601

Dear Mr. Cabina:

Attached is one copy of the Technical Evaluation and Preliminary Determination for the proposed modifications to the No. 7 and No. 8 sulfuric acid plants at your phosphate fertilizer chemical complex located at the intersection of U.S. Highway 41 South and Riverview Drive near Gibsonton, Hillsborough County, Florida.

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

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

Sincerely,

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

CHF/WH/rw
cc: James T. Wilburn
Bill Thomas
Steve Gyorog
Al Morrison
Paul Swartz
Attachments
Reading File
William Hanks

No. 0155791

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED—
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(See Reverse)

SENT TO
Rudy J. Cabina

STREET AND NO.
P.O.Box 3269

P.O., STATE AND ZIP CODE
Tampa,FL 33601

POSTAGE		$
CONSULT POSTMASTER FOR FEES	CERTIFIED FEE	¢
OPTIONAL SERVICES	SPECIAL DELIVERY	¢
OPTIONAL SERVICES	RESTRICTED DELIVERY	¢
OPTIONAL SERVICES — RETURN RECEIPT SERVICE	SHOW TO WHOM AND DATE DELIVERED	¢
OPTIONAL SERVICES — RETURN RECEIPT SERVICE	SHOW TO WHOM, DATE, AND ADDRESS OF DELIVERY	¢
OPTIONAL SERVICES — RETURN RECEIPT SERVICE	SHOW TO WHOM AND DATE DELIVERED WITH RESTRICTED DELIVERY	¢
OPTIONAL SERVICES — RETURN RECEIPT SERVICE	SHOW TO WHOM, DATE AND ADDRESS OF DELIVERY WITH RESTRICTED DELIVERY	¢
TOTAL POSTAGE AND FEES		$
POSTMARK OR DATE		

PS Form 3800, Apr. 1976

PS Form 3811, Jan. 1978

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     Show to whom and date delivered..... ¢
   - ☐ RESTRICTED DELIVERY.
     Show to whom, date, and address of delivery.$

(CONSULT POSTMASTER FOR FEES)

2. ARTICLE ADDRESSED TO:
Rudy J. Cabina
P.O.Box 3269
Tampa, FL 33601

3. ARTICLE DESCRIPTION:

REGISTERED NO.	CERTIFIED NO.	INSURED NO.
	0155791	

(Always obtain signature of addressee or agent)

I have received the article described above.
SIGNATURE ☐Addressee ☐Authorized agent

4. DATE OF DELIVERY
DEC 17 1984

5. ADDRESS (Complete only if requested)

6. UNABLE TO DELIVER BECAUSE:

CLERK'S INITIALS

TAMPA FL DOWNTOWN STA. DEC 17 1984 USPO

RETURN RECEIPT, REGISTERED, INSURED AND CERTIFIED MAIL

☆GPO : 1979-300-459

State of Florida Department of Environmental Regulation

Notice of Proposed Agency Action
on Permit Applications

The Department of Environmental Regulation gives notice of its intent to issue permits to modify Gardinier, Inc.'s No. 7 and No. 8 sulfuric acid plants which are located near Gibsonton, Hillsborough County, Florida.

The Company has requested permission to make modifications to increase production of two existing sulfuric acid plants to 2,200 TPD. A Best Available Control Technology determination was required for each plant. The allowable emissions for each plant, after modifications, will be 4.0 lb sulfur dioxide and 0.15 lb acid mist per ton of acid produced, and visible emissions of 5 percent opacity. These emissions will not cause or contribute to an ambient air quality standard violation or violate any federal, state or county regulation. No increment consumption will result from the changes in emissions at this plant after this modification.

Persons whose substantial interests are affected by the department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must conform to the requirements of Chapters 17-103 and 28-5, Florida Administrative Code, and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Twin Towers Office Building, Tallahassee, Florida 32301, within fourteen (14) days of publication of this notice. Failure to file a request for hearing within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this preliminary statement. Therefore, persons who may not object to the proposed agency action may wish to intervene in the proceeding. A petition for intervention must be filed pursuant to Model Rule 28-5.207 at least five (5) days before the final hearing and be filed with the hearing officer if one has been assigned at the Division of Administrative Hearings, Department of Administration, 2009 Apalachee Parkway, Tallahassee, Florida 32301. If no hearing officer has been assigned, the petition is to be filed with the Department's Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32301. Failure to petition to intervene within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, Florida Statutes.

The application, technical evaluation, and Department's intent for the proposed project are available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at the following locations:

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

Hillsborough County
Environmental Protection
Commission
1900 9th Avenue
Tampa, Florida 33605

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

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

RULES OF THE ADMINISTRATIVE COMMISSION
MODEL RULES OF PROCEDURE
CHAPTER 28-5
DECISIONS DETERMINING SUBSTANTIAL INTERESTS

28-5.15 Requests for Formal and Informal Proceedings

(1) Requests for proceedings shall be made by petition to the agency involved. Each petition shall be printed typewritten or otherwise duplicated in legible form on white paper of standard legal size. Unless printed, the impression shall be on one side of the paper only and lines shall be double spaced and indented.

(2) All petitions filed under these rules should contain:

(a) The name and address of each agency affected and each agency's file or identification number, if known;

(b) The name and address of the petitioner or petitioners;

(c) All disputed issues of material fact. If there are none, the petition must so indicate;

(d) A concise statement of the ultimate facts alleged, and the rules, regulations and constitutional provisions which entitle the petitioner to relief;

(e) A statement summarizing any informal action taken to resolve the issues, and the results of that action;

(f) A demand for the relief to which the petitioner deems himself entitled; and

(g) Such other information which the petitioner contends is material.

BEFORE THE STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

In the Matter of an Application for Permits by:	)	
Gardinier, Inc.	)	DER File No. AC 29-089697
P. O. Box 3269	)	AC 29-089696
Tampa, Florida 32575	)	

INTENT TO ISSUE

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

The applicant, Gardinier, Inc, applied on July 6, 1984, to the Department of Environmental Regulation for permits to make those modifications necessary to increase production of the existing No. 7 and No. 8 sulfuric acid plants at their phosphate fertilizer chemical complex near Gibsonton, Hillsborough County, Florida. The information submitted in the October 15, 1984, letter from the company completed the applications so that they could be processed by the department. Information submitted by the company shows the modified acid plants will comply with all federal, state, and county air pollution control regulations.

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

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

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

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

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the proposed agency action. Therefore, persons who may not wish to file a petition, may wish to intervene in the proceeding. A petition for intervention must be filed pursuant to Model Rule 28-5.207 at least five (5) days before the final hearing and be filed with the hearing officer if one has been assigned at the Division of

Administrative Hearings, 2009 Apalachee Parkway, Tallahassee, Florida 32301. If no hearing officer has been assigned, the petition is to be filed with the Department's Office of General Counsel, 2600 Blair Stone Road, Tallahase, Florida 32301. Failure to petition to intervene within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, Florida Statues.

Executed the 13 day of December, 1984, in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

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

Copies furnished to:

James T. Wilburn
Rudy Cabina
Bill Thomas
Steve Gyorog
Al Morrison

Technical Evaluation
and
Preliminary Determination

Gardinier, Inc.
Gibsonton, Florida
Hillsborough County

Modifications to Sulfuric Acid Plants
Proposed State Construction Permit Numbers
No. 7 Sulfuric Acid Plant - AC 29-089697
No. 8 Sulfuric Acid Plant - AC 29-089696

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

December 4, 1984

I. Project Description

A. Applicant

Gardinier, Inc.
P. O. Box 3269
Tampa, Florida 33601

B. Project and Location

Two of the sulfuric acid plants operated by Gardinier Inc., No. 7 and 8, are presently permitted to produce 1,750 and 1,770 TPD of 100 percent acid, respectively. The Company has applied for permits to modify both plants and increase production in each to 2,200 TPD acid.

The modifications to the No. 7 acid plant involve changing the acid cross-circulating system between the interpass tower acid coolers and pump tanks, adding mixing vanes to the gas duct at the second catalyst mass, and installing a separate pump to transfer water from the cooling tower to the final absorbing tower. The emissions from the No. 7 plant, after modifications, will increase but continue to meet the new source performance standards (NSPS) of 4 lb SO_2/ton acid and 0.15 lb mist/ton acid (40 CFR 60, Subpart H).

The initial modifications to the No. 8 acid plant involve installing parallel gas ducting to the last two catalyst masses and larger steam piping in the plant. If the plant is unable to meet the production or emission limits after these modifications, then the Company shall install a superheater parallel with the boiler, install a new superheater/economizer in the exit of the 3A pass in parallel with the existing one, increase the catalyst in the main converter, and replace the acid cooling coils. If the plant is still unable to meet its production and emissions limits, more extensive modifications to the plant will be made. The permitted emissions from the No. 8 plant will change from 10 lb SO_2 and 0.15 lb acid mist per ton of acid produced to 4 lb SO_2 and 0.15 lb acid mist per ton of acid produced.

The following table summarizes the production and emissions from the plants before and after the modifications.

		Permitted SO_2 Emiss.			Permitted mist Emiss.		
No. 7 Plt	Prod. (TPD)	lb/ton	lb/hr	TPY	lb/ton	lb/hr	TPY
Before	1750	4	291.7	1277.5	0.15	10.9	47.9
After	2200	4	366.7	1606	0.15	13.8	60.2
Change	+450	0	+75.0	+328.5	0	+2.9	+12.3
No. 8 Plt							
Before	1770	10	737.5	3230.3	0.15	11.1	48.5
After	2200	4	366.7	1606	0.15	13.8	60.2
Change	+430	-6	-370.8	-1523.3	0	+2.7	+11.7

The market for phosphate fertilizer products has been depressed. Actual emissions over the past several years from these acid plants have been much lower than permitted emissions. The potential increases in emissions resulting from these modifications are shown in the following table.

	Sulfur Dioxide Emissions TPY	Acid Mist Emissions TPY
Proposed (After Modif.)	3212	120.5
Actual (before Modif.)	885	28.3
Increase	2327	92.2

II. Rule Applicability

The proposed project, modifications to sulfuric acid plants to increase production, is subject to preconstruction review under the provisions of Chapter 403, FS, and Chapter 17-2, FAC.

The sulfuric acid plants are in an area designated nonattainment for particulate matter and ozone (17-2.410), unclassifiable for sulfur dioxide (17-2.430), and attainment for the other criteria pollutants (17-2.420).

The proposed modifications are not subject to New Source Review for Nonattainment Areas (17-2.510) because the sulfuric acid plants are not sources of particulate matter or volatile organic compounds.

The facility is a major source of sulfur dioxide (17-2.100(99)) because total emissions exceed 100 TPY. The modifications will cause significant net emission increases of sulfur dioxide and acid mist. Therefore, the modifications are subject to the Prevention of Significant Deterioration regulations (17-2.500(2)(d)4.) and the preconstruction review requirements outlined in 17-2.500(5). Emission standards for the modified plants will be established by Best Available Control Technology determinations (17-2.500(5)(c)). In addition, the modified plants will have to comply with the applicable Standards of Performance for New Stationary Sources (17-2.660).

The plants must also comply with the regulations of the Hillsborough County Environmental Protection Commission.

III. Technical Evaluation

The department has established the new source performance standards for sulfuric acid plants of 4 lb SO_2/ton acid and 0.15 lb acid mist/ton acid as BACT for both plants. See the Appendix for more details on this determination.

The plants must also comply with the regulations of the Hillsborough County Environmental Protection Commission which limit the visible emission to 5 percent opacity. This is more strict than the applicable state and federal regulations for sulfuric acid plants. Any permit to construct issued for the sulfuric acid plants will limit emissions to 5 percent opacity.

A. No. 7 Sulfuric Acid Plant

The physical modifications proposed for this plant should improve conversion of sulfur dioxide to sulfur trioxide and absorption of the sulfur trioxide in the absorbing tower. Source test data on the existing plant shows the emissions at a lower production rate have been below the new source performance standard of 4 lb SO_2/ton acid and 0.15 acid mist/ton acid. Other data supplied by the company shows the absorbing towers are oversized and should be able to handle the increased production.

B. No. 8 Sulfuric Acid Plant

The initial modifications proposed for the No. 8 sulfuric acid plant will increase the production of sulfuric acid and steam at the plant. Data supplied by the company shows the absorbing towers can handle the additional production. Source test data on this plant shows it can meet the new source performance standards.

If the production and emission standards are not met after the initial modifications to the No. 8 plant, the company will install additional catalyst in the converter to increase

production and heat exchanges to lower the temperature of the gas and absorbing acid streams. The lower temperature should improve the removal of sulfur oxides from the gas stream.

If, after these modifications, the plant is still unable to meet its production and emission standards, more extensive modifications to the plant will be needed. The company will be required to obtain prior approval from the department and Hillsborough County Environmental Protection Commission before proceeding with any major modifications.

IV. Air Quality Impact

Gardinier, Inc. is designated a major facility for air pollution, emitting greater than 100 tons per year of a regulated pollutant. The company is currently proposing to expand the production capacities of its numbers 7 and 8 sulfuric acid (H_2SO_4) plants. This modification will result in a significant increase in emissions of sulfur dioxide (SO_2) and sulfuric acid mist. Both of these pollutants are thus subject to review under the prevention of significant deterioration (PSD) regulations. The air quality analysis required for these pollutants includes:

- o An analysis of existing air quality;
- o A PSD increment analysis (for SO_2 only);
- o An ambient air quality standards (AAQS) analysis;
- o An analysis of impacts on soils, vegetation and visibility, and growth-related air quality impacts, and;
- o A "Good Engineering Practice" (GEP) stack height determination.

The analysis of existing air quality generally relies on preconstruction monitoring data collected in accordance with EPA-approved methods. The PSD increment and AAQS analyses depend on air quality dispersion modeling carried out in accordance with EPA guidelines.

Based on these required analyses, the department has reasonable assurance that the proposed modification at the Gardinier facility, as described in this report and subject to the conditions of approval proposed herein, will not cause or contribute to a violation of any PSD increment or ambient air quality standards. A discussion of the modeling methodology and required analyses follows.

Modeling Methodology

The EPA-approved Industrial Source Complex Short-Term (ISCST) dispersion model was used in the air quality impact analysis. This model predicts ground-level concentrations of inert gases or small particles emitted into the atmosphere by point, area, and volume sources. The model allows for the

separation of sources, user-determined location of receptors, and several other features such as building wake downwash. The model is generally applicable to level or gently rolling terrain.

A five-year record of sequential hourly meteorological data was used in the modeling analysis. The surface data were National Weather surface data collected at the Tampa International Airport during the years 1973, 74, 75, 78, and 79. The upper air data were also National Weather Service data collected at their office in Ruskin, Florida during the same years. The twice-daily radiosonde soundings taken at Ruskin are processed into hourly mixing depths which are directly used in the model.

The applicant divided the modeling analysis into screening and refined phases. In the screening phase a coarser network of receptor points was used and the emissions were limited to major sources (i.e., sources with SO_2 emissions of more than 250 tons per year). The five-year meteorological record was used and the highest, second-highest short-term concentrations were predicted along with the maximum annual averages. The refined phase then remodeled the highest, second-highest short term concentrations developed in the screening phase using a refined receptor grid (100 meter receptor spacing) and a more detailed emission inventory which included all sources upwind of the receptor. Total ambient air quality impacts were based on the modeled impacts plus a background concentration.

Pollutant concentrations were predicted both on and off plant property. The Gardinier property is irregularly shaped but extends approximately 2.3 kilometers in the north-south and 1.5 kilometers in the east-west. The public is generally precluded access from this area.

The stack parameters and emissions rates for the Gardinier facility used in the modeling analysis are listed in Table I.

Analysis of Existing Air Quality

Preconstruction ambient air quality monitoring is required for all pollutants subject to PSD review. In general, one year of quality assured data using an EPA-reference, or the equivalent, monitor must be submitted. Sometimes less than one year of data, but no less than four months, may be accepted when department approval is given.

An exemption to the monitoring requirement can be obtained if the maximum air quality impact, as determined through air quality modeling, is less than a pollutant-specific de minimus concentration. In addition, if current monitoring data already exist and these data are representative of the proposed source area, then at the discretion of the department, these data may be used.

For the proposed modification monitoring data is required for SO_2 only. Sulfuric acid mist is not regulated by an ambient air quality standard and no approved method of monitoring this pollutant is available; therefore, no further impact analysis is required.

The applicant has proposed the use of existing SO_2 monitoring data to satisfy the monitoring requirement. The Hillsborough County Environmental Protection Commission runs several continuous SO_2 monitors within ten kilometers of the Gardinier facility. These monitors are currently in operation and are run within the quality assurance guidelines of the state. The department accepts these data as representative of the area and suitable for PSD requirements. Table II summarizes the SO_2 monitoring data in the area of the Gardinier facility.

PSD Increment Analysis

The Gardinier facility is located in an area designated as a Class II attainment area for the pollutant SO_2. Within this area, maximum allowable increases (PSD increments) represent the amount that new sources, or increases from modified sources, may increase ambient ground-level concentrations of SO_2. At no time, however, can the increased loading cause or contribute to a violation of the ambient air quality standards.

All SO_2 emission increases from sources constructed or modified after December 27, 1977 will consume PSD increment. In addition, all SO_2 emission increases associated with the construction or modification of major sources which occur after January 6, 1975, will consume increment. Decreases in emissions can expand increment.

The proposed production increases for the number 7 and 8 sulfuric acid plants result in actual increases in SO_2 emissions and consumption of PSD increment. However, three other sulfuric acid plants at the Gardinier facility were shut down in October 1976. As such these units can expand the maximum allowable increase in the area.

Table III quantifies the actual emission changes subject to PSD increment consumption or expansion. The numbers 4, 5, and 6 sulfuric acid plants account for a larger emission reduction than the numbers 7 and 8 units do an emission increase. In addition, units 4, 5, and 6 emitted through stacks which were about half the height of the stacks for units 7 and 8. As such, the net impact of this facility is to expand the PSD increment, therefore, no further increment analysis is necessary.

Ambient Air Quality Standards Analysis

Given existing air quality in the area of the Gardinier facility, emissions from the proposed production increase are not expected to cause or contribute to a violation of ambient air quality standards. The results of the ambient air quality standards analysis are contained in Table IV.

Of the pollutants subject to PSD review (SO_2 and sulfuric acid mist), only the criteria pollutant SO_2 has an ambient standard to compare with. All Gardinier's sources listed in Table I were modeled along with other interacting sources to determine the maximum ground-level impacts for SO_2. In the modeling performed by the applicant the number 8 sulfuric acid plant was modeled assuming an emission of 10 lb SO_2 per ton of acid produced. This source is being permitted to emit only 4 lb SO_2 per ton of acid produced. Thus, the modeling overestimated the ambient impacts due to this source. The department has remodeled the days of maximum impact to estimate the concentrations with the number 8 unit emitting at the lower level.

The total impact on ambient air is obtained by adding a background concentration to the maximum modeled concentration. This background concentration takes into account all sources that were not explicitly modeled. An estimate of this background level for SO_2 is given by the maximum annual concentration measured at any of the surrounding monitors in the most recent year, 1983, as given in Table II. The background level added to all maximum concentrations is 21 ug/m^3.

Additional Impacts Analysis

Soils and Vegetation

The maximum ground-level concentrations predicted to occur for the criteria pollutants as a result of the proposed modification in conjunction with all other sources, including a background concentration, will be below all applicable ambient air quality standards including the secondary standards designed to protect public welfare-related values. As such these pollutants are not expected to have a harmful impact on soils and vegetation.

Visibility

A level-1 visibility screening analysis was performed by the applicant to assess the impact to visibility on the nearest PSD Class I area. This area is the Chassahowitzka National Wilderness Area located approximately 85 kilometers from the Gardinier facility. The analysis showed that there was no

potential for an adverse impact due to emissions from the proposed modification.

Growth Related Impacts

The production increase at the Gardinier facility is not expected to significantly change employment, population, housing, or commercial-industrial development in the area to the extent that an air quality impact will result.

GEP Stack Height

Good engineering practice (GEP) stack height means the greater of: (1) 65 meters; or (2) the maximum nearby building height plus 1.5 times the building height or width, whichever is less. The existing stacks for the numbers 7 and 8 sulfuric acid plants are 45.6 meters in height. This is less than the allowed 65 meter height.

V. Conclusion

Based on the information submitted by Gardinier, Inc., the department has concluded that the Nos. 7 and 8 sulfuric acid plants can be modified to produce 2,200 TPD of sulfuric acid and be operated in compliance with all applicable air pollution control regulations. The department proposes to issue construction permits that authorize modifications to both plants. The General and Specific Conditions listed in the proposed permits (attached) will assure compliance of the sources with the air pollution control regulations.

Table I

Source Emissions and Stack Parameters

Facility/Source	SO_2 Emission Rate (g/s)	Stack Height (m)	Stack Diameter (m)	Exit Gas Temp. (K)	Exit Gas Velocity (m/s)	UTM-E (km)	UTM-N (km)
Gardinier							
H_2SO_4 7	46.2	45.6	2.29	339	13.1	363.20	3082.30
H_2SO_4 8	46.2	45.6	2.44	339	11.5	263.30	3082.40
$HsSO_4$ 9	55.3	45.6	2.74	347	10.0	363.20	3082.45
KVS 12	0.16	21.6	0.49	333	21.5	362.90	3082.60
RM 5	0.01	20.1	0.61	336	14.9	362.65	3082.60
RM 6-10	0.049	29.0	0.61	339	29.1	362.90	3082.60
CON 7	10.75	23.8	1.83	347	5.8	362.80	3082.70
CON 8	10.75	23.8	1.83	344	5.8	362.80	3082.70
CTMD 3	4.84	20.7	1.07	316	10.7	362.65	3082.60
CTMD 4	4.84	20.7	1.07	316	12.2	362.65	3082.60
GTSP	14.3	38.4	2.44	327	11.0	362.60	3082.45
DM 1,2	0.19	27.4	1.22	336	16.8	362.60	3082.40
DM 3,4	0.19	27.4	1.07	336	20.4	362.60	3082.30
DM 5	3.05	40.4	2.13	314	16.0	362.60	3082.25
SSF	0.069	12.2	0.51	322	9.1	362.75	3082.45

Table II

SO_2 Monitoring Data Within 10 km of Gardinier, Inc.

Site	Distance from Gardinier (km)	Monitoring Method	Year	No. of Observations	SO_2 Concentration (ug/m^3) 3-hour Max	3-hour 2nd Max	24-hour Max	24-hour 2nd Max	Annual Average
1800-021	8.2	Continuous	1981	8,181	897	652	123	116	15
			1982	7,714	693	629	160	125	15
			1983	8,506	751	729	124	114	14
1800-066	3.9	Gas Bubbler	1981	52	--	--	63	58	14
			1982	51	--	--	39	24	8
			1983	50	--	--	45	29	7
1800-083	0.6	Gas Bubbler	1981	52	--	--	110	47	14
			1982	51	--	--	52	31	8
			1983	57	--	--	76	31	8
4360-035	9.8	Continuous	1981	7,655	293	291	116	116	28
			1982	8,481	376	334	103	88	25
			1983	8,241	327	291	85	77	21
4360-052	8.6	Continuous	1981	7,459	271	266	118	102	18
			1982	8,615	452	327	117	97	24
			1983	8,550	527	493	108	86	16
4360-053	9.5	Continuous	1981	7,754	219	217	64	60	14
			1982	8,467	375	292	90	84	19
			1983	8,062	225	222	69	68	16

Table III

SO_2 Emission Changes at Gardinier
Which Affect PSD Increment Consumption

Unit	Date	Change	Actual SO_2 Emissions (tons/yr)
No. 7 H_2SO_4 Plant	9/79	Increase of capacity from 1380 TPD to 1750 TPD, based on 4 lb SO_2/ton.	+270
No. 7 H_2SO_4	current proposed	Increase capacity from 1750 TPD to 2200 TPD, based on 4 lb SO_2/ton.	+329
No. 8 H_2SO_4 Plant	current proposed	Increase capacity from 1770 TPD to 2200 TPD, based on 4 lb SO_2/ton.	+312
No. 4 H_2SO_4 Plant	10/76	Unit Shutdown, average of previous 2 years.	-892
No. 5 H_2SO_4 Plant	10/76	Unit Shutdown, average of previous 2 years.	-1773
No. 6 H_2SO_4 Plant	10/76	Unit Shutdown, average of previous 2 years.	-2469
		Net Change	-4223

Table IV

Comparison of Total Impacts with
Ambient Air Quality Standards

Pollutant and Averaging Time	Maximum Impact Gardinier (ug/m^3)	Maximum Impact All Sources (ug/m^3)	Existing Background (ug/m^3)	Maximum Total Impact (ug/m^3)	Florida AAQS (ug/m^3)
SO_2					
3-hour	509	766	21	787	1300
24-hour	189	204	21	225	260
Annual	20	34	21	55	60

Best Available Control Technology (BACT) Determination
Gardinier Inc.
Hillsborough County

The applicant plans to increase the product rate from their number 7 and number 8 sulfuric acid plants that are located at their Tampa phosphate fertilizer complex. The production of sulfuric acid from the No. 7 plant will be increased from 1750 tons per day (TPD) to 2200 TPD, and the No. 8 plant from 1770 TPD also to 2200 TPD. No restrictions to limit the hours of operation of either plant has been requested.

Increasing the product output from the two sulfuric acid plants will also result in more air pollutants being emitted to the atmosphere. The air pollutants emitted from a sulfuric acid plant are sulfur dioxide (SO_2) and acid mist. The amount of SO_2 emitted to the atmosphere is an inverse function of sulfur conversion efficiency. When sulfur trioxide combines with water vapor at a temperature below the dew point of sulfur trioxide acid mist is formed. The amount of acid mist is usually dependent upon the type of sulfur feedstock, the strength of acid produced, and the operational parameters in the absorber. Based upon the applicant's data the net increase in air pollutant emissions would be 2327 tons SO_2 and 92 tons acid mist per year.

Under the regulations prescribed in Chapter 17-2, Florida Administrative Code, the increase in SO_2 and acid mist emissions exceed the significant emission rates as listed in Table 500-2. A BACT determination, therefore, is required for the regulated air pollutants sulfur dioxide and acid mist.

BACT Determination Requested by the Applicant:

The air pollutant emissions from No. 7 sulfuric acid plant would be limited to 4 pounds SO_2 and 0.15 pound acid mist per ton of 100% acid produced.

The air pollutant emissions from No. 8 sulfuric acid plant would be limited to 10 pounds SO_2 and 0.30 pound acid mist per ton of 100% acid produced.

Date Receipt of a BACT application:

July 6, 1984

Date of Publication in the Florida Administrative Weekly:

July 27, 1984

Review Group Members:

The determination was based upon comments received from the Stationary Source Control Section, Air Modeling and Data Analysis Section, the Southwest District Office, and the Hillsborough County Environmental Protection Commission.

BACT Determined by DER:

Sulfur Acid Plants No. 7 and No. 8

Pollutant	Emission Limit
Sulfur Dioxide (SO_2)	Not to exceed 4 pounds per ton of 100% acid produced
Acid Mist[1]	Not to exceed 0.15 pounds per ton of 100% acid produced
Visible Emissions	5% opacity maximum

[1] Acid mist means sulfuric acid mist, as measured by Method 8 of 40 CFR 60, Appendix A.

Compliance with the emission limits will be in accordance with the test methods and procedures prescribed in subsection 60.85, Subpart H, New Source Performance Standards.

DER Method 9 (17-2.700(6)(a)9, FAC) will be used to determine compliance with the visible emission limit.

BACT Determination Rationale:

Florida Administrative Code Rule 17-2.100(105) defines "modification" as any physical change in, or addition to a stationary facility which increase the actual emissions of any air pollutant, regulated under this Chapter, including any not previously emitted, from any source within such facility.

If the increase in emissions as a result of the major source modification are equal to or greater than the significant emission rates listed in Table 500-2, Regulated Air Pollutants - Significant Emission Rates; a Best Available Control Technology (BACT) determination is required, Rule 17-2.500(5)(c). In no event shall application of BACT result in emissions of any pollutant which would exceed the emissions allowed under 40 CFR Part 60 - New Source Performance Standards (NSPS), Rule 17-2.630(1)(a).

Sulfuric Acid plants are subject to the provisions of the New Source Performance Standards, 40 CFR 60.80, Subpart H. The standards under Subpart H are; 4.0 pounds SO_2 per ton of acid produced and 0.15 pound acid mist per ton of acid produced, expressed as 100 percent sulfuric acid. The visible emissions limit is less than 10 percent opacity.

The NSPS standards, Subpart H, were reviewed by EPA in 1979 and EPA concluded that from the standpoint of technology, and considering costs, and the small quantity of emissions in question, that it did not appear necessary to revise the standards. The department has reviewed the test results obtained from several different sulfuric acid plants and concurs with EPA's conclusion. The provisions of Subpart H are judged to be BACT.

The visible emissions opacity limitation determined as BACT is equal to Hillsborough Counties requirement as per Chapter 1-3.03 V1.C - visible emissions shall not exceed 5% opacity except for 30 minute periods during plant startups when opacity shall be no greater than 40%.

The air quality impact of the proposed emissions has been analyzed. Atmospheric dispersion modeling has been completed and used in conjunction with an analysis of existing air quality to determine maximum ground-level ambient concentrations of the pollutants subject to BACT. Based on these analyses, the department has reasonable assurance that the proposed sulfuric acid plant modifications, subject to the these BACT emission limitations, will not cause or contribute to a violation of an PSD increment or ambient air quality standard.

Details of the Analysis may be Obtained by Contacting:

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

Recommended by:

_____

C. H. Fancy, Deputy Bureau Chief

Date:_____

Approved by:_____

_____

Victoria J. Tschinkel, Secretary

Date:_____

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

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

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

PERMITTEE:
Gardinier, Inc.
P. O. Box 3269
Tampa, Florida 33601

Permit Number:AC 29-089696
Expiration Date: October 1, 1987
County: Hillsborough
Latitude/Longitude: 27° 51' 28"N
82° 23' 15"W/
Project: No. 8 Sulfuric Acid Plant

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rule(s) 17-2 and 17-4, and 40 CFR 52.21. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawings, plans, and other documents attached hereto or on file with the department and made a part hereof and specifically described as follows:

Modifications to the No. 8 sulfuric acid plant that will increase production from 1770 to 2200 TPD. The modifications involve installing parallel gas ducting to the last two catalyst masses, installing larger steam piping from the plant, installing a superheater parallel with the No. 1 boiler, installing a superheater/economizer in the exit of the 3A pass, installing additional catalyst in the main converter, replacing the existing acid cast iron cooling coils with stainless steel heat exchanges, and other major modification that have prior approval of the department and the Hillsborough County Environmental Protection Commission.

The UTM coordinates of the site are 17-363.3E and 3082.4N.

Construction shall be in accordance with the application for a permit to construct the No. 8 Sulfuric Acid Plant that was signed by Mr. Rudy J. Cabina on July 3, 1984, and the additional information supplied in Gardinier, Inc.'s September 11, 1984, and October 15, 1984, letters except for the changes mentioned in the Technical Evaluation and Preliminary Determination and listed as specific conditions in the permit to construct.

PERMITTEE:
Gardinier, Inc.

Permit Number: AC 29-089696
Expiration Date: October 1, 1987

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions" and as such are binding upon the permittee and enforceable pursuant to the authority of Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is hereby placed on notice that the department will review this permit periodically and may initiate enforcement action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the department.

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit does not constitute a waiver of or approval of any other department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute state recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, plant or aquatic life or property and penalties therefore caused by the construction or operation of this permitted source, nor does it allow the permittee to cause pollution in contravention of Florida Statutes and department rules, unless specifically authorized by an order from the department.

GENERAL CONDITIONS:

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

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

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

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

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

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

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately notify and provide the department with the following information:

a. a description of and cause of non-compliance; and

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

GENERAL CONDITIONS:

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the department for penalties or revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, which are submitted to the department, may be used by the department as evidence in any enforcement case arising under the Florida Statutes or department rules, except where such use is proscribed by Sections 403.73 and 403.111, Florida Statutes.

10. The permittee agrees to comply with changes in department rules and Florida Statutes after a reasonable time for compliance, provided however, the permittee does not waive any other rights granted by Florida Statutes or department rules.

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

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

13. This permit also constitutes:

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

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

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

GENERAL CONDITIONS:

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

c. Records of monitoring information shall include:

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

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

SPECIFIC CONDITIONS:

1. Sulfuric acid production, measured as 100 percent H_2SO_4, shall not exceed 2,200 TPD.

2. Sulfur dioxide emissions shall not exceed 4.0 lb/ton acid and 8,800 lb/day.

3. Acid mist emissions shall not exceed 0.15 lb/ton acid and 330 lb/day.

4. Visible emissions shall not exceed 5 percent opacity, average for any consecutive 6 minute period.

SPECIFIC CONDITIONS:

5. The test methods and procedures described in 40 CFR 60.85 shall be used to determine the compliance status of the source with the sulfur dioxide and acid mist standards. Method 9, as described in 40 CFR 60, Appendix A, shall be used to determine the compliance status of the source with the visible emission standard.

6. A continuous monitoring system for the measurement of sulfur dioxide shall be installed, calibrated, maintained, and operated on this plant as specified in 40 CFR 60.84. Excess emissions shall be reported to the Hillsborough County Enviromental Protection Commission.

7. The applicant shall comply with all requirements of 40 CFR 60, Subpart H, Standards of Performance for Sulfuric Acid Plants.

8. The plant may operated continuously, 8760 hours per year.

9. This construction permit replaces the current operating permit for this sulfuric acid plant. During the modifications of this plant, the emissions shall not exceed 10 lb SO_2 per ton of acid and 0.15 lb acid mist per ton of acid while the plant is operating commercially.

10. Construction shall reasonably conform to the plans and schedule in the application and October 15, 1984 letter. Bi-annual reports describing the status of the modifications shall be submitted to the state and county regulatory agencies. Gardinier, Inc. shall obtain prior approval from the department and county before preceding with any construction referred to as "Third Modification" in the October 15, 1984 letter.

11. Gardinier Inc. shall take precautionary measures to prevent emissions from leaks at the plant.

12. Gardinier, Inc. shall submit a complete application for permit to operate the sulfuric acid plant, which include an emissions test report, to the Hillsborough County Environmental Protection Commission at least 90 days prior to the expiration date of this construction permit. Gardinier, Inc. may continue to operate this sulfuric acid plant, if the source is in compliance with the conditions in this permit, until the expiration date of this construction permit or until the expiration date of any permit to operate that is issued for this source.

PERMITTEE:
Gardinier, Inc.

Permit Number: AC 29-089696
Expiration Date: October 1, 1987

SPECIFIC CONDITIONS:

13. Upon obtaining a permit to operate, the applicant will be required to submit annual operation reports which shall include, as a minimum, the annual production of the plant and a recent emissions test report.

Issued this_____day of_____, 19__

STATE OF FLORIDA DEPARTMENT OF
ENVIRONMENTAL REGULATION

_____
VICTORIA J. TSCHINKEL, Secretary

____ pages attached.

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

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

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

PERMITTEE:
Gardinier, Inc.
P. O. Box 3269
Tampa, Florida 33601

Permit Number:AC 29-089697
Expiration Date: July 1, 1985
County: Hillsborough
Latitude/Longitude: 27° 51' 28"N
82° 23' 15"W/
Project: No. 7 Sulfuric Acid Plant

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rule(s) 17-2 and 17-4, and 40 CFR 52.21. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawings, plans, and other documents attached hereto or on file with the department and made a part hereof and specifically described as follows:

Modifications to the No. 7 sulfuric acid plant that will increase production from 1750 to 2200 TPD. The modifications involve changing the acid cross-circulating system between the interpass tower acid coolers and pump tanks to a hot cross flow systems, adding new mixing vanes in the gas duct to the second catalyst mass, and installing a separate pump to transfer water from the existing cooling water tower to the final absorbing tower.

The UTM coordinates of the site are 17-363.2E and 3082.3N.

Construction shall be in accordance with the application for a permit to construct the No. 7 Sulfuric Acid Plant that was signed by Mr. Rudy J. Cabina on July 3, 1984, and the additional information supplied in Gardinier, Inc.'s September 11, 1984, and October 15, 1984, letters except for the changes mentioned in the Technical Evaluation and Preliminary Determination and listed as specific conditions in the permit to construct.

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions" and as such are binding upon the permittee and enforceable pursuant to the authority of Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is hereby placed on notice that the department will review this permit periodically and may initiate enforcement action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the department.

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit does not constitute a waiver of or approval of any other department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute state recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, plant or aquatic life or property and penalties therefore caused by the construction or operation of this permitted source, nor does it allow the permittee to cause pollution in contravention of Florida Statutes and department rules, unless specifically authorized by an order from the department.

GENERAL CONDITIONS:

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

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

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

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

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

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

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately notify and provide the department with the following information:

a. a description of and cause of non-compliance; and

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

GENERAL CONDITIONS:

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the department for penalties or revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, which are submitted to the department, may be used by the department as evidence in any enforcement case arising under the Florida Statutes or department rules, except where such use is proscribed by Sections 403.73 and 403.111, Florida Statutes.

10. The permittee agrees to comply with changes in department rules and Florida Statutes after a reasonable time for compliance, provided however, the permittee does not waive any other rights granted by Florida Statutes or department rules.

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

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

13. This permit also constitutes:

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

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

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

GENERAL CONDITIONS:

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

c. Records of monitoring information shall include:

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

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

SPECIFIC CONDITIONS:

1. Sulfuric acid production, measured as 100 percent H_2SO_4, shall not exceed 2,200 TPD.

2. Sulfur dioxide emissions shall not exceed 4.0 lb/ton acid and 8,800 lb/day.

3. Acid mist emissions shall not exceed 0.15 lb/ton acid and 330 lb/day.

4. Visible emissions shall not exceed 5 percent opacity, average for any consecutive 6 minute period.

SPECIFIC CONDITIONS:

5. The test methods and procedures described in 40 CFR 60.85 shall be used to determine the compliance status of the source with the sulfur dioxide and acid mist standards. Method 9, as described in 40 CFR 60, Appendix A, shall be used to determine the compliance status of the source with the visible emission standard.

6. A continuous monitoring system for the measurement of sulfur dioxide shall be installed, calibrated, maintained, and operated on this plant as specified in 40 CFR 60.84. Excess emissions shall be reported to the Hillsborough County Enviromental Protection Commission.

7. The applicant shall comply with all requirements of 40 CFR 60, Subpart H, Standards of Performance for Sulfuric Acid Plants.

8. The plant may operate continuously, 8760 hours per year.

9. This construction permit replaces the current operating permit for this sulfuric acid plant. During the modifications to this plant, the emissions shall not exceed 4.0 lb SO_2 per ton acid and 0.15 lb acid mist per ton of acid while the plant is operating commerically.

10. Construction shall reasonably conform to the plan and schedule in the application. Any delays encoutnered during construction will be reported to the Hillsborough County Environmental Protection Commission.

11. Gardinier Inc. shall take precautionary measures to prevent emissions from leaks at the plant.

12. Gardinier, Inc. shall submit a complete application for permit to operate the sulfuric acid plant, which include an emissions test report, to the Hillsborough County Environmental Protection Commission at least 90 days prior to the expiration date of this construction permit. Gardinier, Inc. may continue to operate this sulfuric acid plant, if the source is in compliance with the conditions in this permit, until the expiration date of this construction permit or until the expiration date of any permit to operate that is issued for this source.

PERMITTEE:
Gardinier, Inc.

Permit Number: AC 29-089697
Expiration Date: July 1, 1985

SPECIFIC CONDITIONS:

13. Upon obtaining a permit to operate, the applicant will be required to submit annual operation reports which shall include, as a minimum, the annual production of the plant and a recent emissions test report.

Issued this_____day of_____, 19__

STATE OF FLORIDA DEPARTMENT OF
ENVIRONMENTAL REGULATION

_____
VICTORIA J. TSCHINKEL, Secretary

____ pages attached.

GARDINIER INC.

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

July 3, 1984

DER
JUL 6 1984
BAQM

Mr. Clair Fancy
Deputy Chief, Air Quality Management
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

Subject: Construction Permit and PSD Application for No. 7 and No. 8 Sulfuric Acid Plants

Dear Clair:

As discussed, Gardinier is submitting the following:

Construction Permit Application - No. 7 Sulfuric Acid Plant (3 Cys)

Construction Permit Application - No. 8 Sulfuric Acid Plant (3 Cys)

Air Quality Impact Assessment - No. 7 & No. 8 Sulfuric Acid Plants (3 Cys)

Printout Data - (1 Cy)

Two Checks for Permit Application Fees

One copy each of the two applications and the Air Quality Impact Assessment is being sent to the DER District Office and Hillsborough County Environmental Protection Commission. Also, two checks to Hillsborough County for their application fees.

The PSD Assessment was made by Environmental Science and Engineering, Inc., in Gainesville, Florida (Mr. David Buff, in particular).

If you have any questions, please advise.

Very truly yours,

A. E. Morrison
Manager, Environmental Services

AEM:rw
Enclosures
cc: Mr. Rudy J. Cabina
Mr. Roger Stewart, HCEPC
Mr. Dan Williams, DER, Tampa

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

Nº 76035

RECEIPT FOR APPLICATION FEES AND MISCELLANEOUS REVENUE

Received from Gardenier Inc. Date July 12, 1984

Address P.O. Box 3269, Tampa Florida 33601 Dollars $ 2,000.00

Applicant Name & Address Same as above

Source of Revenue

Revenue Code 001031 Application Number AC 29-089697
AC 29-089694

By Patricia D. Adams

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

Nº 76035

RECEIPT FOR APPLICATION FEES AND MISCELLANEOUS REVENUE

Received from Gardenier, Inc. Date July 12, 1984

Address P.O. Box 3269, Tampa, Florida 33601 Dollars $ 2,000.00

Applicant Name & Address Same as above

Source of Revenue

Revenue Code 001031 Application Number AC 29-089697
AC 29-089694

By Patricia D. Adams

GARDINIER, INC. TAMPA, FLORIDA

CHECK NO. 065871

66-798
531

DATE MO.	DAY	YR.
5	29	84

PAY EXACTLY ******1,000 DOLLARS AND 00 CENTS

DOLLARS	CENTS
$******1,000	00

VOID 90 DAYS AFTER CHECK DATE

TO THE ORDER OF
FLORIDA DEPARTMENT OF
ENVIRONMENTAL REGULATION
7601 HIGHWAY 301 N
TAMPA FL 33610

PAYABLE AT
NCNB NATIONAL BANK OF FLORIDA
TAMPA, FLORIDA
OR PAYABLE AT
NCNB NATIONAL BANK OF NORTH CAROLINA
ASHEVILLE, N.C.

[redacted]

[redacted]

GARDINIER, INC. TAMPA, FLORIDA

CHECK NO. 066063

66-798
531

DATE MO.	DAY	YR.
5	30	84

PAY EXACTLY ********170 DOLLARS AND 00 CENTS

DOLLARS	CENTS
$********170	00

VOID 90 DAYS AFTER CHECK DATE

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

PAYABLE AT
NCNB NATIONAL BANK OF FLORIDA
TAMPA, FLORIDA
OR PAYABLE AT
NCNB NATIONAL BANK OF NORTH CAROLINA
ASHEVILLE, N.C.

[redacted]

GARDINIER, INC. TAMPA, FLORIDA

CHECK NO. 065921

66-798
531

DATE MO.	DAY	YR.	PAY EXACTLY	DOLLARS AND	CENTS	DOLLARS	CENTS
5	29	84	********170	00		$********170	00

VOID 90 DAYS AFTER CHECK DATE

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

PAYABLE AT
NCNB NATIONAL BANK OF FLORIDA
TAMPA, FLORIDA
OR PAYABLE AT
NCNB NATIONAL BANK OF NORTH CAROLINA
ASHEVILLE, N.C.

[redacted]

[redacted]

GARDINIER, INC. TAMPA, FLORIDA

CHECK NO. 066008

66-798
531

DATE MO.	DAY	YR.	PAY EXACTLY	DOLLARS AND	CENTS	DOLLARS	CENTS
5	30	84	******1,000	00		$******1,000	00

VOID 90 DAYS AFTER CHECK DATE

TO THE ORDER OF
FLORIDA DEPARTMENT OF
ENVIRONMENTAL REGULATION
7601 HIGHWAY 301 N
TAMPA FL 33610

PAYABLE AT
NCNB NATIONAL BANK OF FLORIDA
TAMPA, FLORIDA
OR PAYABLE AT
NCNB NATIONAL BANK OF NORTH CAROLINA
ASHEVILLE, N.C.

[redacted]

AC 29-089696

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

DER

JUL 6 1984

BAQM

SOURCE TYPE: Air Pollution [ ] New[1] [X] Existing[1]

APPLICATION TYPE: [X] 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; Peeking Unit No. 2, Gas Fired) No. 8 Sulfuric Acid Plant

SOURCE LOCATION: Street U.S. Highway 41 South & Riverview Drive City South of Tampa

UTM: East 363.3 North 3082.4

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

APPLICANT NAME AND TITLE: Rudy J. Cabina, Vice President

APPLICANT ADDRESS: P.O. Box 3269, Tampa, Florida 33601

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: By: Rudy J Cabina

Rudy J. Cabina, Vice President
Name and Title (Please Type)

Date: 7/3/84 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 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.

REGISTERED ENGINEER STATE OF FLORIDA (Affix Seal)

Signed: By: Robert B. Melreit

Robert B. Melreit
Name (Please Type)

Gardinier, Inc.
Company Name (Please Type)

P.O. Box 3269, Tampa, Florida 33601
Mailing Address (Please Type)

Florida Registration No. 20408 Date: 7/3/84 Telephone No. 813 677 9111

[1]See Section 17-2.02(15) and (22), Florida Administrative Code, (F.A.C.)

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.

This project will modify the No. 8 Sulfuric Acid Plant to produce 430 tons per day of additional sulfuric acid. Emissions from this source will comply with all applicable State of Florida and Hillsborough County regulations.

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

Start of Construction November 1, 1984 Completion of Construction January 31, 1985

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.)

Modifications to converter and steam system - $250,000

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

Permit No.	A029-18228	A029-2930	AC29-2390
Issued	Apr 26, 1979	Apr 21, 1977	Nov 25, 1974
Expire	Apr 15, 1984	May 10, 1979	Mar 1, 1977

E. Is this application associated with or part of a Development of Regional Impact (DRI) pursuant to Chapter 380, Florida Statutes, and Chapter 22F-2, Florida Administrative Code? ____ Yes __X__ No

F. Normal equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 52 ; if power plant, hrs/yr n/a ; if seasonal, describe: not seasonal

G. 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? Yes
   a. If yes, has "offset" been applied? N/A
   b. If yes, has "Lowest Achievable Emission Rate" been applied? N/A
   c. If yes, list non-attainment pollutants.
      Total suspended particulates, Ozone
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) requirements 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

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		
Sulfur	-	-	60,404	A
Oxygen	-	-	90,193	B
Water	-	-	33,680	C

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

1. Total Process Input Rate (lbs/hr): 184,277

2. Product Weight (lbs/hr): 183,333

C. Airborne Contaminants Emitted:

Name of Contaminant	Emission[1]		Allowed Emission[2] Rate per Ch. 17-2, F.A.C.	Allowable[3] Emission lbs/hr	Potential Emission[4]		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/hr	T/yr	
Sulfur Dioxide	917	4,015	10 lb/ton H_2SO_4	917	917	4,015	D
Sulfuric Acid	27.5	120.5	0.3lb/ton H_2SO_4	27.5	27.5	120.5	D

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

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles[5] Size Collected (in microns)	Basis for Efficiency (Sec. V, It[5]
Final Converter	Sulfur Dioxide	99.5+	-	See Attach.
Final Absorber and Mist	Sulfuric Acid	99+	unk	
Eliminator	Mist			

[1]See Section V, Item 2.

[2]Reference applicable emission standards and units (e.g., Section 17-2.05(6) Table II, E. (1), F.A.C. – 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)

[5]If Applicable

E. Fuels NO FUELS USED

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

*Units Natural Gas, MMCF/hr; Fuel Oils, barrels/hr; Coal, 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 N/A Maximum N/A

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

There are no solid wastes. Cooling tower and boiler blowdown will be discharged to a deepwell injection disposal system.

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

Stack Height: 149.5 ft. Stack Diameter: 8.0 ft.

Gas Flow Rate: 113,790 ACFM Gas Exit Temperature: 150 °F

Water Vapor Content: 0.0 % Velocity: 37.7 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.)
Lbs/hr Incinerated							

Description of Waste _____

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

Approximate Number of Hours of Operation per day _____ days/week _____

Manufacturer _____

Date Constructed _____ Model No. _____

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

Stack Height: _____ ft. Stack Diameter _____ 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.):

SECTION V: SUPPLEMENTAL REQUIREMENTS

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation.
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, 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 8½" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.
7. An 8½" 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 8½" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

Supplemental Requirements

1. Total Process Input Rate and Product Weight:

The following data and chemical equations will describe the input rates and product weight:

The atomic weight of sulfur (2) is 32.064
The molecular weight of oxygen (O_2) is 31.9988
The molecular weight of water (H_2O) is 18.01534
The molecular weight of sulfur dioxide (SO_2) is 64.0628
The molecular weight of sulfur trioxide (SO_3) is 80.0622
The molecular weight of sulfuric acid (H_2SO_4) is 98.0754

The following chemical equations describe the production of sulfuric acid:

$$S + O_2 \text{ -----} \rightarrow SO_2$$

$$SO_2 + \tfrac{1}{2}O_2 \text{ -----} \rightarrow SO_3$$

$$SO_3 + H_2O \text{ -----} \rightarrow H_2SO_4$$

If the plant produces 183,333 lbs/hr of H_2SO_4 and emits 917 lbs/hr of SO_2 and 27.5 lbs/hr of H_2SO_4 mist, then the amounts of sulfur, oxygen and water required are easily calculated. These amounts are:

Sulfur = 60,404 lbs/hr

Oxygen = 90,193 lbs/hr

Water = 33,680 lbs/hr

Total = 184,277 lbs/hr input weight

2. Emission estimate is based on performance standards for existing sulfuric acid plants. EPA Method 8 will be used to determine compliance.

3. Potential discharge is the actual emission.

4. Design details are discussed in attached report.

5. SO_2 Efficiency based on sulfur budget is as follows:

Total Sulfur input = 60,404 lbs/hr

Sulfur Emitted as SO_2 = 458 lbs/hr

$$\frac{458}{60404} \times 100 = .759\%$$

100% - 0.759% = 99.24% Efficiency

Acid Mist Efficiency is 99.99%

9. An application fee of $20, unless exempted by Section 17-4.05(3), F.A.C. 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

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?
[ ] Yes [x] No

Contaminant	Rate or Concentration
Not applicable	Not applicable

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy) [ ] Yes [ ] No

Contaminant	Rate or Concentration
Sulfur Dioxide	10 lb/ton H_2SO_4
Sulfuric Acid Mist	0.3 lb/ton H_2SO_4

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

Contaminant	Rate or Concentration
Sulfur Dioxide	10 lb/ton H_2SO_4
Sulfuric Acid Mist	0.3 lb/ton H_2SO_4

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

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:
5. Useful Life:
6. Operating Costs:
7. Energy:
8. Maintenance Cost:
9. Emissions:

Contaminant	Rate or Concentration

*Explain method of determining D 3 above.

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*: d. Capital Cost:

e. Useful Life: f. Operating Cost:

g. Energy*: 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*: d. Capital Cost:

e. Useful Life: f. Operating Cost:

g. Energy**: h. Maintenance Costs:

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:

*Explain method of determining efficiency.

**Energy to be reported in units of electrical power – KWH design rate.

3.

a. Control Device:

b. Operating Principles:

c. Efficiency*: d. Capital Cost:

e. Life: f. Operating Cost:

g. Energy: h. Maintenance Cost:

*Explain method of determining efficiency above.

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*:

d. Capital Cost:

e. Life:

f. Operating Cost:

g. Energy:

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*:
3. Capital Cost:
4. Life:
5. Operating Cost:
6. Energy:
7. Maintenance Cost:
8. Manufacturer:
9. Other locations where employed on similar processes:

a.

(1) Company:

(2) Mailing Address:

(3) City:

(4) State:

(5) Environmental Manager:

(6) Telephone No.:

*Explain method of determining efficiency above.

(7) Emissions*:

Contaminant	Rate or Concentration

(8) Process Rate*:

b.

(1) Company:

(2) Mailing Address:

(3) City:

(4) State:

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

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions*:

Contaminant	Rate or Concentration

(8) Process Rate*:

10. Reason for selection and description of systems:

*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

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.

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

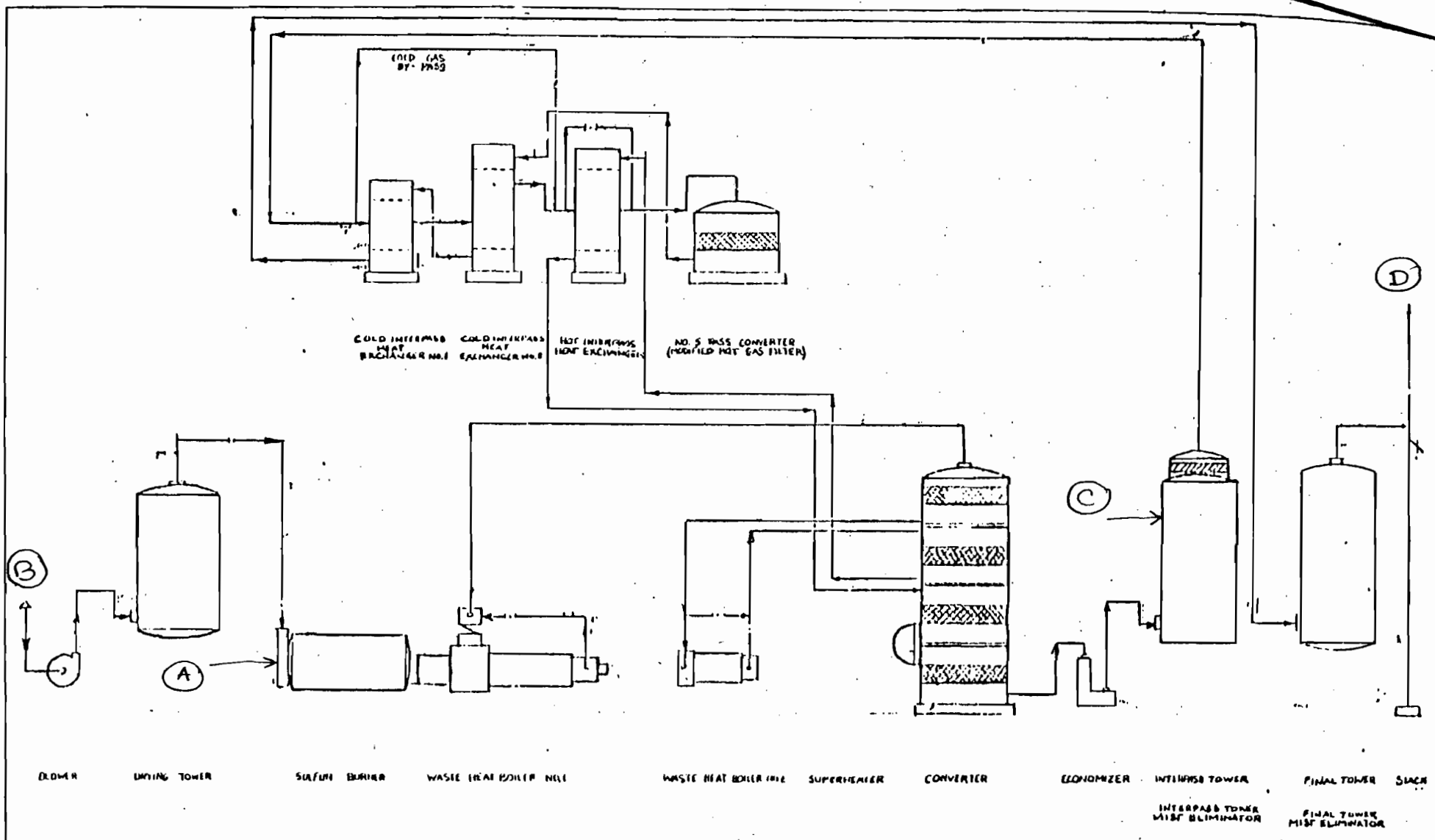
Attach list of emission sources. Emission data required is source name, description on point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

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

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

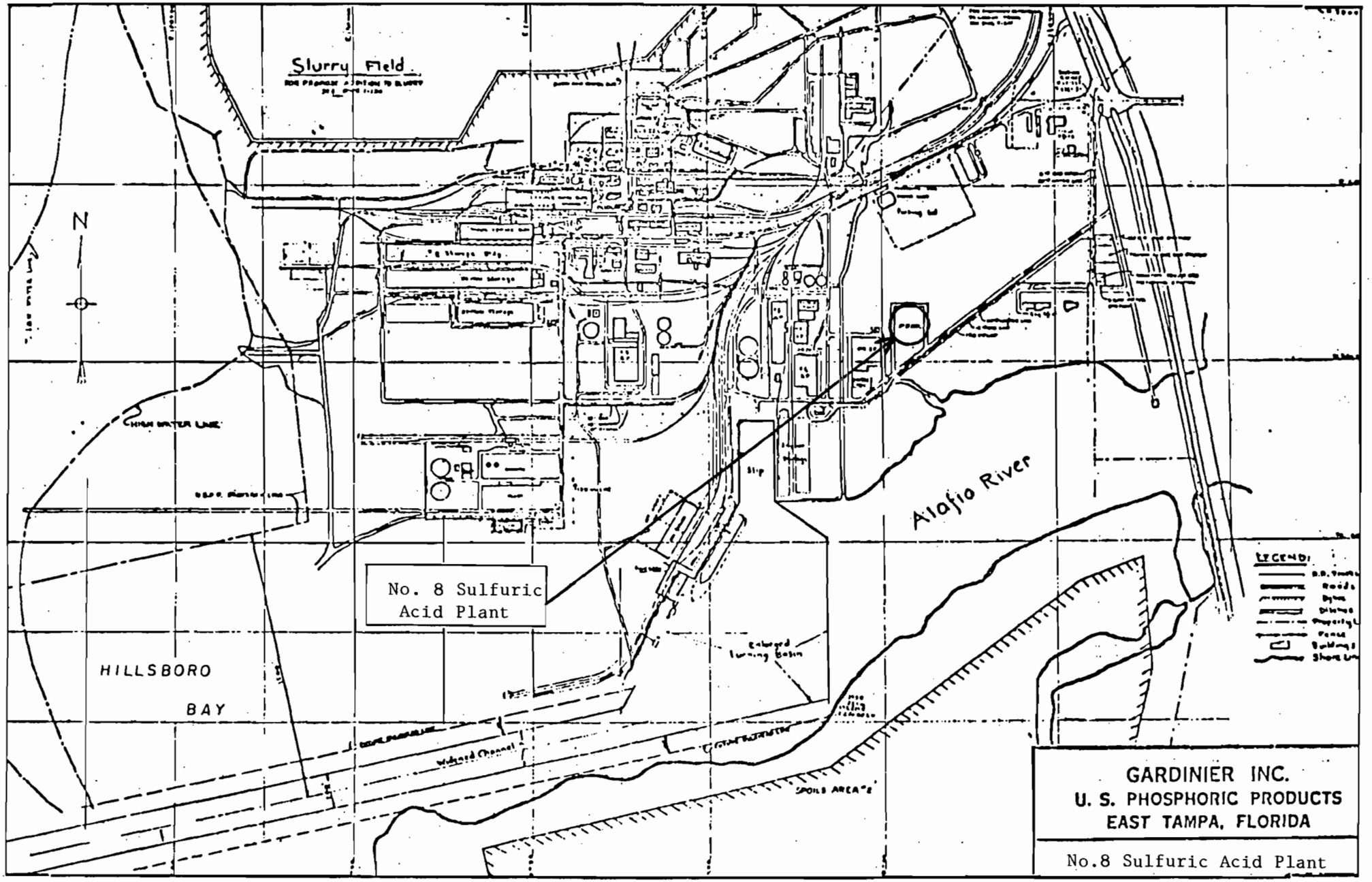
G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

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.



FLOW DIAGRAM

NO. 8 CONTACT ACID PLANT


Slurry Field
N
HIGH WATER LINE
Alafia River
No. 8 Sulfuric Acid Plant
HILLSBORO
BAY
Widened Channel
SPOILS AREA "B"
LEGEND:
GARDINIER INC.
U. S. PHOSPHORIC PRODUCTS
EAST TAMPA, FLORIDA
No.8 Sulfuric Acid Plant

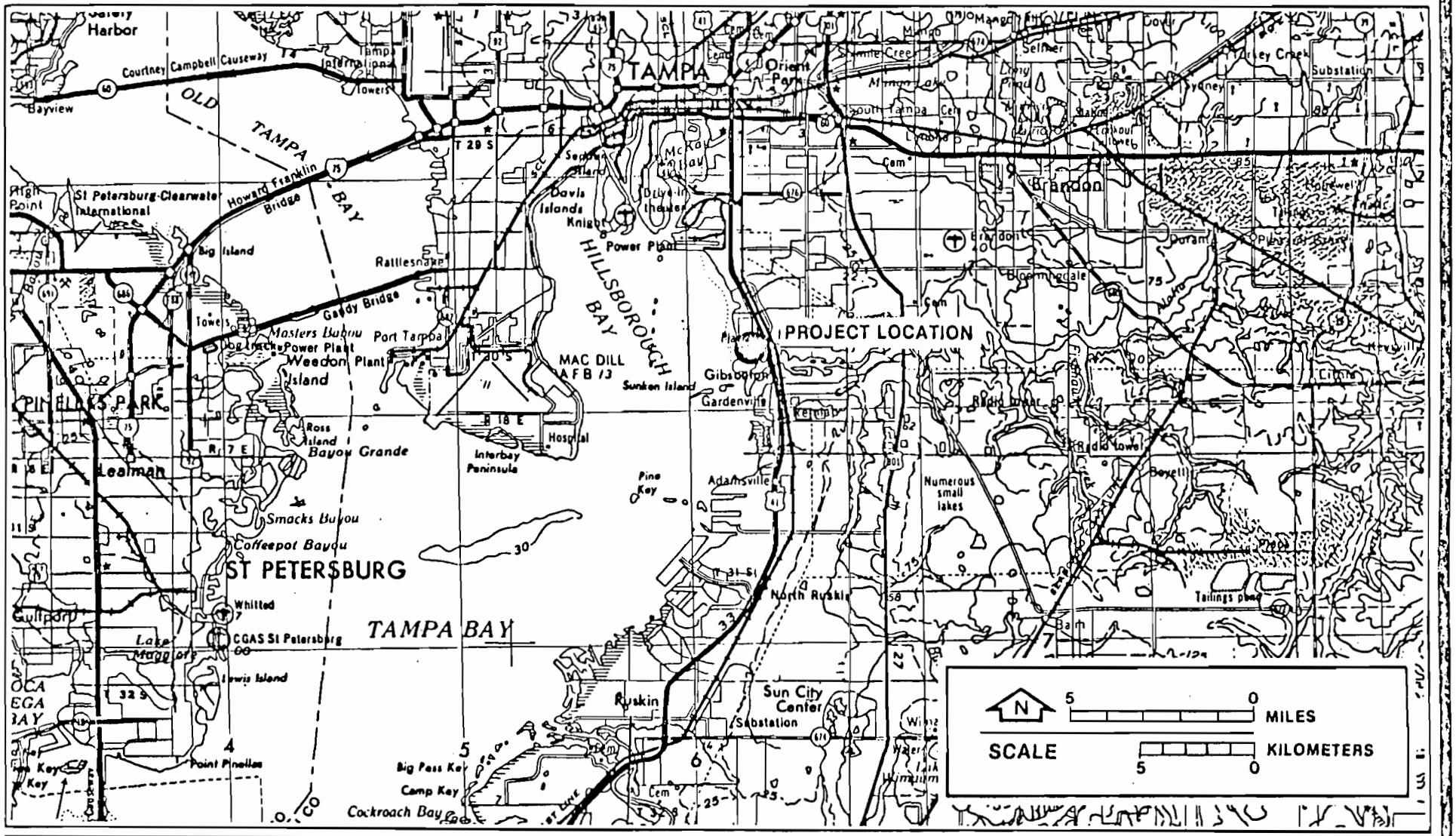


Figure 1-1
GENERAL LOCATION MAP OF GARDINIER, INC.

SOURCE: USGS, 1972.

GARDINIER, INC.
TAMPA, FLORIDA

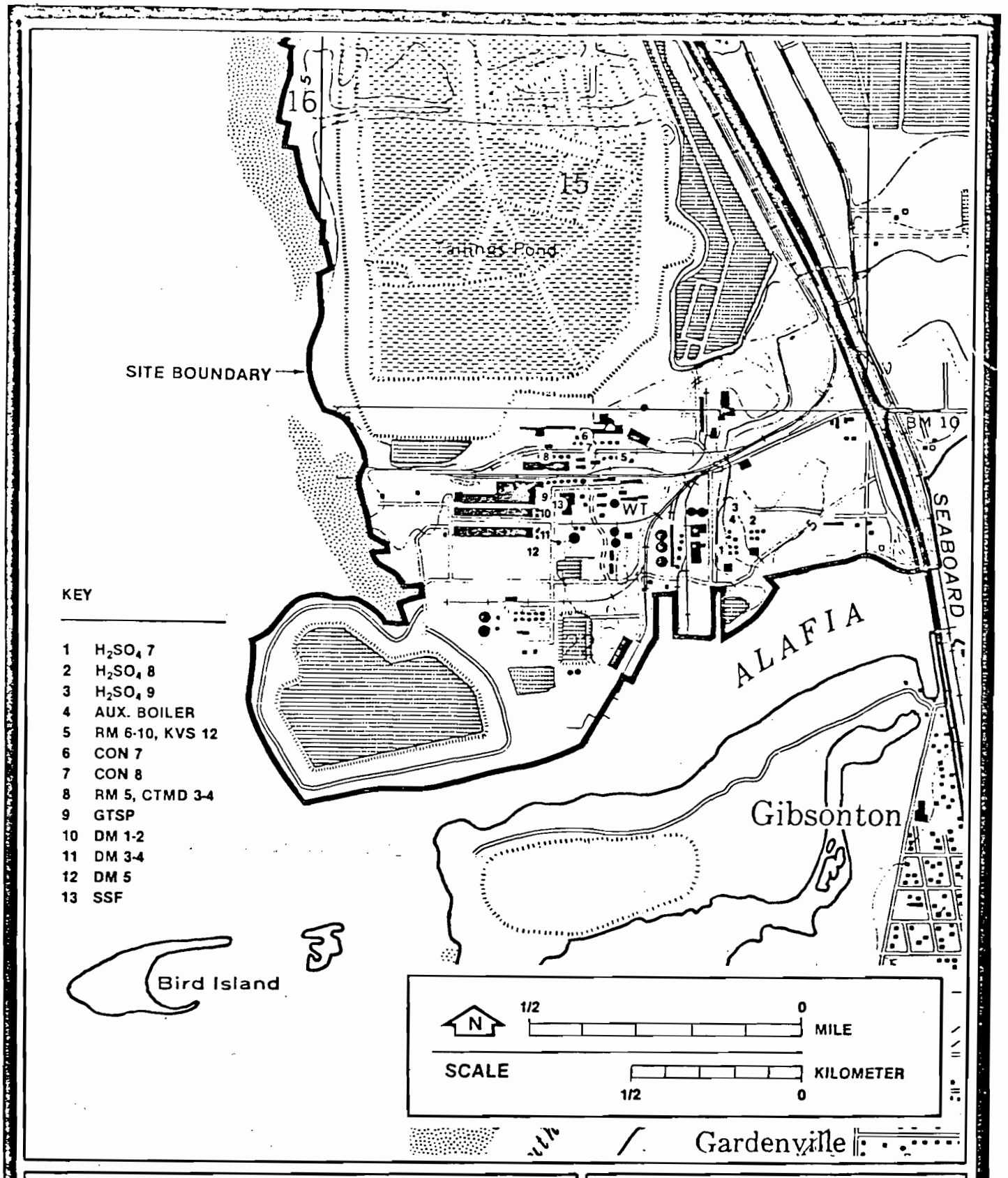


Figure 1-2
SITE LOCATION MAP OF GARDINIER, INC.

SOURCE: USGS, 1981.

GARDINIER, INC.
TAMPA, FLORIDA

GARDINIER INC.

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

-C-E-R-T-I-F-I-C-A-T-E-

I, Robert C. Guthrie, Secretary of GARDINIER, INC. a Delaware Corporation (hereinafter called the "Corporation"), DO HEREBY CERTIFY that attached hereto is a correct and complete copy of a resolution duly adopted by the Board of Directors of the Corporation at the Regular Meeting thereof held on July 13, 1982, duly convened and held pursuant to notice, at which meeting a quorum was present and acting throughout, and such resolution has not been amended or revoked and such resolution is now in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand this day of January 4, 1983.

Robert C. Guthrie

Robert C. Guthrie
Secretary

RESOLVED THAT Mr. Pearce A. Nelson and/or Mr. Rudy J. Cabina, or either of them be and each hereby is, appointed as the authorized representative of GARDINIER, INC. to execute the applications for permits to operate/construct pollution sources.

State of Florida

Department of State

I certify from the records of this office that GARDINIER, INC., a Delaware corporation, is authorized to transact business within the State of Florida, qualified on February 15, 1973.

The charter number for this corporation is 829527.

I further certify that said corporation has filed all annual reports and paid all annual report filing fees due this office through December 31, 1982, and its status is active.

Given under my hand and the Great Seal of the State of Florida, at Tallahassee, the Capital, this the 25th day of January, 1983.

George Firestone
Secretary of State

CER 101

GARDINIER, INC. TAMPA, FLORIDA

CHECK NO. 065921

66-798
531

DATE MO.	DAY	YR.	PAY EXACTLY	DOLLARS AND	CENTS	DOLLARS	CENTS
5	29	84	********170	00		$********170	00

VOID 90 DAYS AFTER CHECK DATE

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

PAYABLE AT
NCNB NATIONAL BANK OF FLORIDA
TAMPA, FLORIDA
OR PAYABLE AT
NCNB NATIONAL BANK OF NORTH CAROLINA
ASHEVILLE, N.C.

[redacted]

[redacted]

GARDINIER, INC. TAMPA, FLORIDA

CHECK NO. 066008

66-798
531

DATE MO.	DAY	YR.	PAY EXACTLY	DOLLARS AND	CENTS	DOLLARS	CENTS
5	30	84	******1,000	00		$******1,000	00

VOID 90 DAYS AFTER CHECK DATE

TO THE ORDER OF
FLORIDA DEPARTMENT OF
ENVIRONMENTAL REGULATION
7601 HIGHWAY 301 N
TAMPA FL 33610

PAYABLE AT
NCNB NATIONAL BANK OF FLORIDA
TAMPA, FLORIDA
OR PAYABLE AT
NCNB NATIONAL BANK OF NORTH CAROLINA
ASHEVILLE, N.C.

[redacted]

AC 29-089697

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

DER
JUL 6 1984
BAQM

SOURCE TYPE: Air Pollution [ ] New[1] [X] Existing[1]

APPLICATION TYPE: [X] 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; Peeking Unit No. 2, Gas Fired) No. 7 Sulfuric Acid Plant

SOURCE LOCATION: Street U.S. Highway 41 & Riverview Drive City South of Tampa

UTM: East 363.2 North 3082.3

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

APPLICANT NAME AND TITLE: Rudy J. Cabina, Vice President

APPLICANT ADDRESS: P.O. Box 3269, Tampa, Florida 33601

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: By: Rudy J Cabina

Rudy J. Cabina, Vice President
Name and Title (Please Type)

Date: 7/3/84 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 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.

(Affix Seal)

Signed: By: Robert B Melreit

Robert B. Melreit
Name (Please Type)

Gardinier, Inc.
Company Name (Please Type)

P.O. Box 3269, Tampa, Florida 33601
Mailing Address (Please Type)

Florida Registration No. 20408 Date: 7/3/84 Telephone No. 813 677 9111

[1]See Section 17-2.02(15) and (22), Florida Administrative Code, (F.A.C.)

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.

This project will modify the No. 7 Sulfuric Acid Plant to produce 450 tons per day of additional sulfuric acid. Emissions from this source will comply with all applicable State of Florida and Hillsborough County regulations.

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

Start of Construction November 1, 1984 Completion of Construction January 31, 1985

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.)

Modifications to Converter - $85,000

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

Permit No.	A029-22820	AC29-21337	A029-5763	AC29-2384	A029-2180	A029-5699
Issued	Sep 10, 1982	Sep 7, 1979	Nov 2, 1977	Nov 25, 1974	May 25, 1973	Sep 1982
Expire	Jul 15, 1987	Jul 1, 1983	Sep 30, 1979	Mar 1, 1977	Jul 1, 1975	July 1987

E. Is this application associated with or part of a Development of Regional Impact (DRI) pursuant to Chapter 380, Florida Statutes, and Chapter 22F-2, Florida Administrative Code? ____ Yes __X__ No

F. Normal equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 52 ; if power plant, hrs/yr n/a ;

if seasonal, describe: Not seasonal

G. 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? Yes
   a. If yes, has "offset" been applied? N/A
   b. If yes, has "Lowest Achievable Emission Rate" been applied? N/A
   c. If yes, list non-attainment pollutants.

      Total Suspended Particulate, Ozone

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

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		
Sulfur	-	-	60,124	A
Atmospheric Oxygen	-	-	89,911	B
Water	-	-	33,678	C

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

1. Total Process Input Rate (lbs/hr): 183,713

2. Product Weight (lbs/hr): 183,333

C. Airborne Contaminants Emitted:

Name of Contaminant	Emission[1]		Allowed Emission[2] Rate per Ch. 17-2, F.A.C.	Allowable[3] Emission lbs/hr	Potential Emission[4]		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/hr	T/yr	
Sulfur Dioxide	367	1606	4.0lb/ton H_2SO_4	367	367	1606	D
Acid Mist	13.8	60.2	0.15 lb/ton H_2SO_4	13.8	13.8	60.2	D

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

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles[5] Size Collected (in microns)	Basis for Efficiency (Sec. V, It[5]
Final Converter	Sulfur Dioxide	99.5+	-	
Final Absorber & Mist Eliminator	Sulfuric Acid Mist	99+	Unk	

[1]See Section V, Item 2.

[2]Reference applicable emission standards and units (e.g., Section 17-2.05(6) Table II, E. (1), F.A.C. – 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)

[5]If Applicable

E. Fuels NO FUEL IS USED

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

*Units Natural Gas, MMCF/hr; Fuel Oils, barrels/hr; Coal, 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.

There are no solid wastes. Cooling tower and boiler blowdown will be discharged to a deep well injection disposal system.

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

Stack Height: 149.5 ft. Stack Diameter: 7.5 ft.

Gas Flow Rate: 113,925 ACFM Gas Exit Temperature: 150 °F.

Water Vapor Content: 0 % Velocity: 43.0 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.)
Lbs/hr Incinerated							

Description of Waste _____

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

Approximate Number of Hours of Operation per day _____ days/week _____

Manufacturer _____

Date Constructed _____ Model No. _____

NOT APPLICABLE

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

Stack Height: _____ ft. Stack Diameter _____ 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.):

SECTION V: SUPPLEMENTAL REQUIREMENTS

Please provide the following supplements where required for this application.

1. Total process input rate and product weight – show derivation.
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, 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 8½" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.
7. An 8½" 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 8½" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

Supplemental Requirements

1. Total Process Input Rate and Product Weight:

The following data and chemical equations will describe the input rates and product weight:

The atomic weight of sulfur (2) is 32.064
The molecular weight of oxygen (O_2) is 31.9988
The molecular weight of water (H_2O) is 18.01534
The molecular weight of sulfur dioxide (SO_2) is 64.0628
The molecular weight of sulfur trioxide (SO_3) is 80.0622
The molecular weight of sulfuric acid (H_2SO_4) is 98.0754

The following chemical equations describe the production of sulfuric acid:

$$S + O_2 \longrightarrow SO_2$$

$$SO_2 + \tfrac{1}{2}O_2 \longrightarrow SO_3$$

$$SO_3 + H_2O \longrightarrow H_2SO_4$$

If the plant produces 183,333 lbs/hr of H_2SO_4 and emits 367 lbs/hr of SO_2 and 13.8 lbs/hr of H_2SO_4 mist, then the amounts of sulfur, oxygen and water required are easily calculated. These amounts are:

Sulfur = 60,124 lbs/hr

Oxygen = 89,911 lbs/hr

Water = 33,678 lbs/hr

Total = 183,713 lbs/hr input weight

2. Emission estimate is based on performance standards for existing sulfuric acid plants. EPA Method 8 will be used to determine compliance.

3. Potential discharge is the actual emission.

4. Design details are discussed in attached report.

5. SO_2 Efficiency based on sulfur budget is as follows:

Total Sulfur input = 60,124 lbs/hr

Sulfur Emitted as SO_2 = 124 lbs/hr

$$\frac{184}{60,124} \times 100 = .31\%$$

100% - 0.31 % = 99.69% Efficiency

Acid Mist Efficiency is 99.99%

9. An application fee of $20, unless exempted by Section 17-4.05(3), F.A.C. 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

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?
[X] Yes [ ] No

Contaminant	Rate or Concentration
Sulfur Dioxide	4.0 lb/ton H_2SO_4
Sulfuric Acid Mist	0.15 lb/ton H_2SO_4

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy) [ ] Yes [ ] No

Contaminant	Rate or Concentration
Sulfur Dioxide	4.0 lb/ton H_2SO_4
Sulfuric Acid Mist	0.15 lb/ton H_2SO_4

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

Contaminant	Rate or Concentration
Sulfur Dioxide	4.0 lb/ton H_2SO_4
Sulfuric Acid Mist	0.15 lb/ton H_2SO_4

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

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:
5. Useful Life:
6. Operating Costs:
7. Energy:
8. Maintenance Cost:
9. Emissions:

Contaminant	Rate or Concentration

*Explain method of determining D 3 above.

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. SEE ATTACHMENT

a. Control Device:

b. Operating Principles:

c. Efficiency*: d. Capital Cost:

e. Useful Life: f. Operating Cost:

g. Energy*: 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*: d. Capital Cost:

e. Useful Life: f. Operating Cost:

g. Energy**: h. Maintenance Costs:

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:

*Explain method of determining efficiency.

**Energy to be reported in units of electrical power – KWH design rate.

3.

a. Control Device:

b. Operating Principles:

c. Efficiency*: d. Capital Cost:

e. Life: f. Operating Cost:

g. Energy: h. Maintenance Cost:

*Explain method of determining efficiency above.

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*:

d. Capital Cost:

e. Life:

f. Operating Cost:

g. Energy:

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: SEE ATTACHMENT

1. Control Device:

2. Efficiency*:

3. Capital Cost:

4. Life:

5. Operating Cost:

6. Energy:

7. Maintenance Cost:

8. Manufacturer:

9. Other locations where employed on similar processes:

a.

(1) Company:

(2) Mailing Address:

(3) City:

(4) State:

(5) Environmental Manager:

(6) Telephone No.:

*Explain method of determining efficiency above.

(7) Emissions*:

Contaminant	Rate or Concentration

(8) Process Rate*:

b.

(1) Company:

(2) Mailing Address:

(3) City:

(4) State:

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

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions*:

Contaminant	Rate or Concentration

(8) Process Rate*:

10. Reason for selection and description of systems:

*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

A. Company Monitored Data SEE ATTACHMENT

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.

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

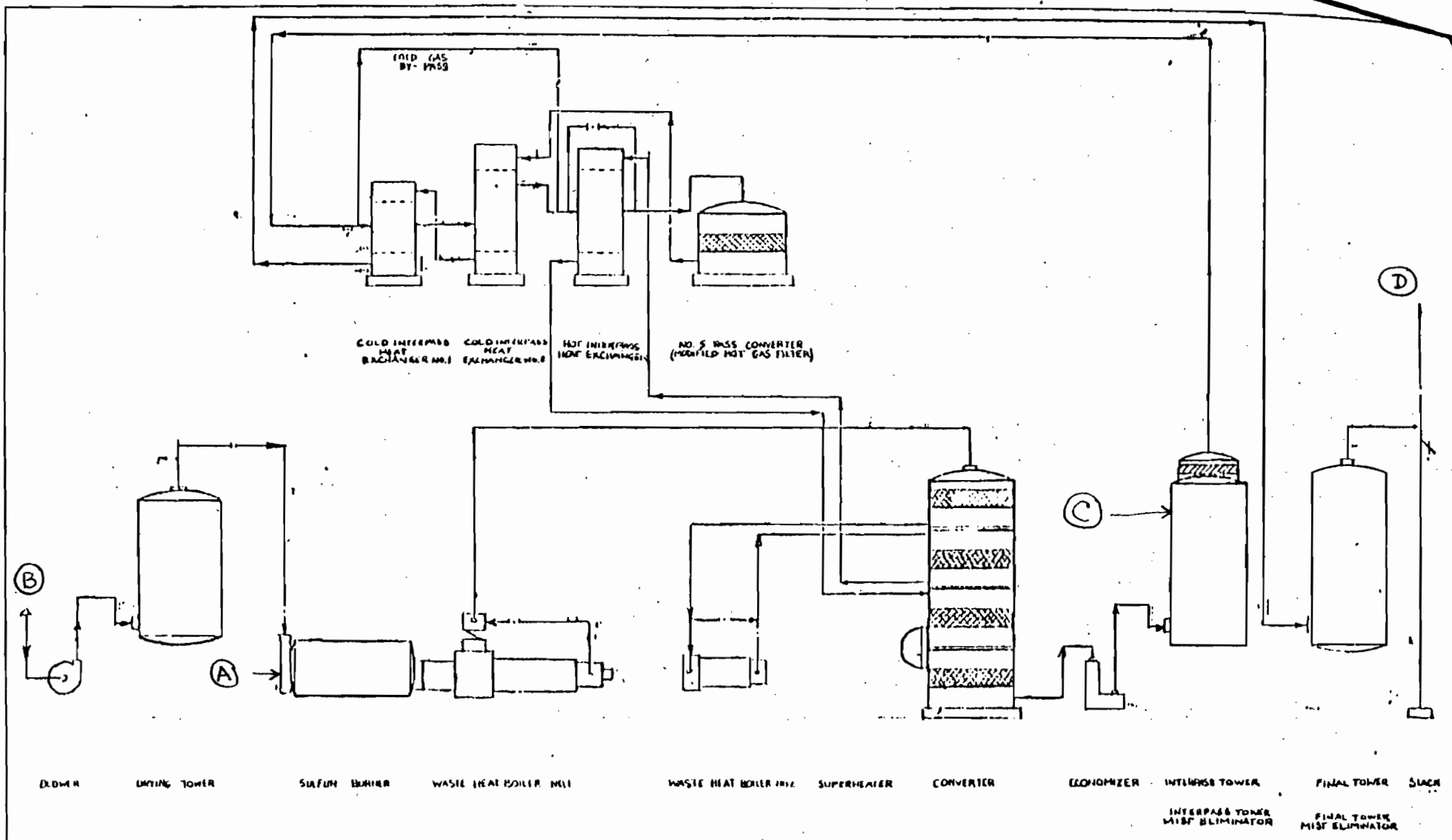
Attach list of emission sources. Emission data required is source name, description on point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

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

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

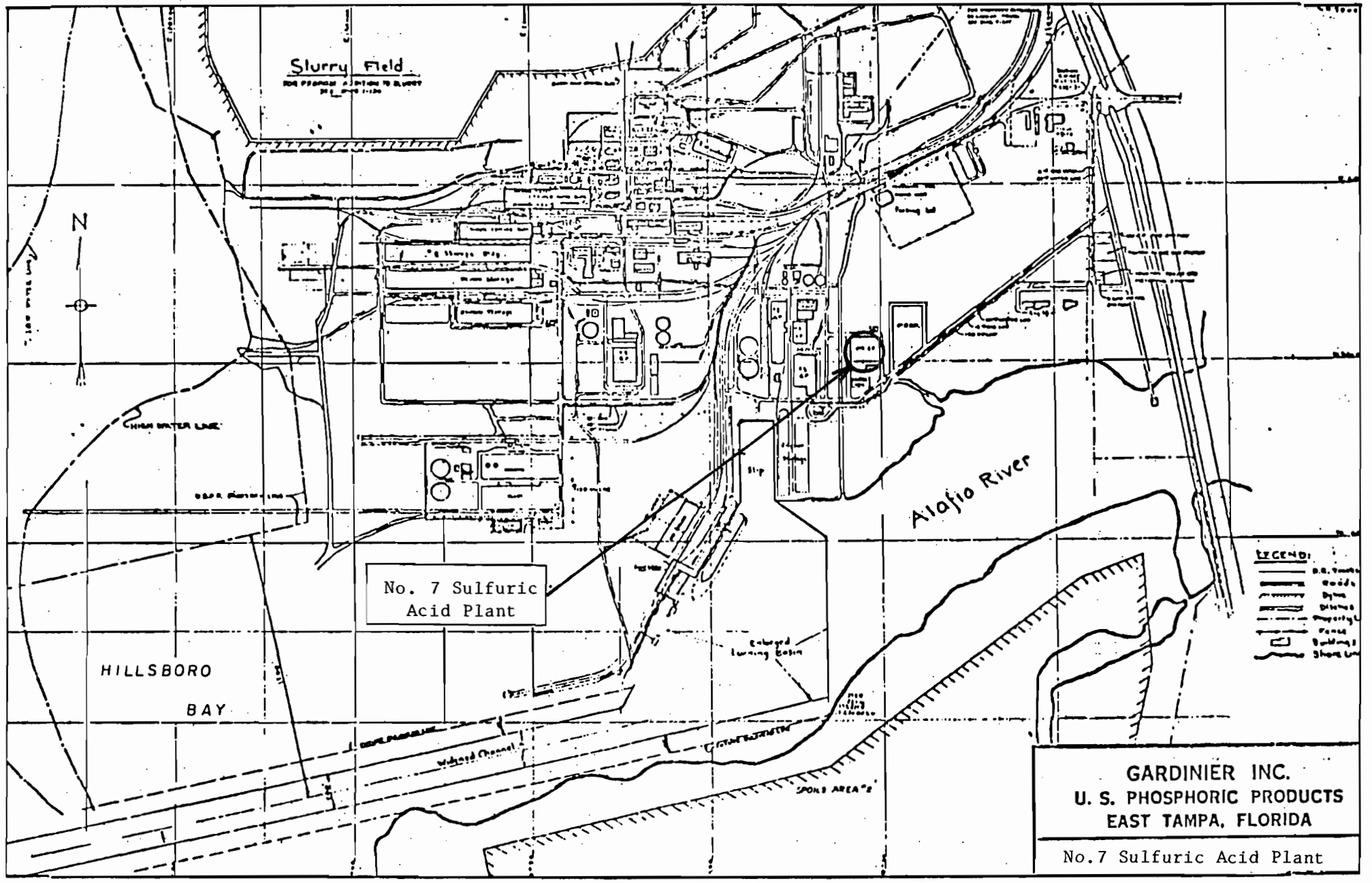
G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

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.



FLOW DIAGRAM

No. 7 CONTACT ACID PLANT


Slurry Field
N
Alafia River
No. 7 Sulfuric
Acid Plant
HILLSBORO
BAY
GARDINIER INC.
U. S. PHOSPHORIC PRODUCTS
EAST TAMPA, FLORIDA
No.7 Sulfuric Acid Plant

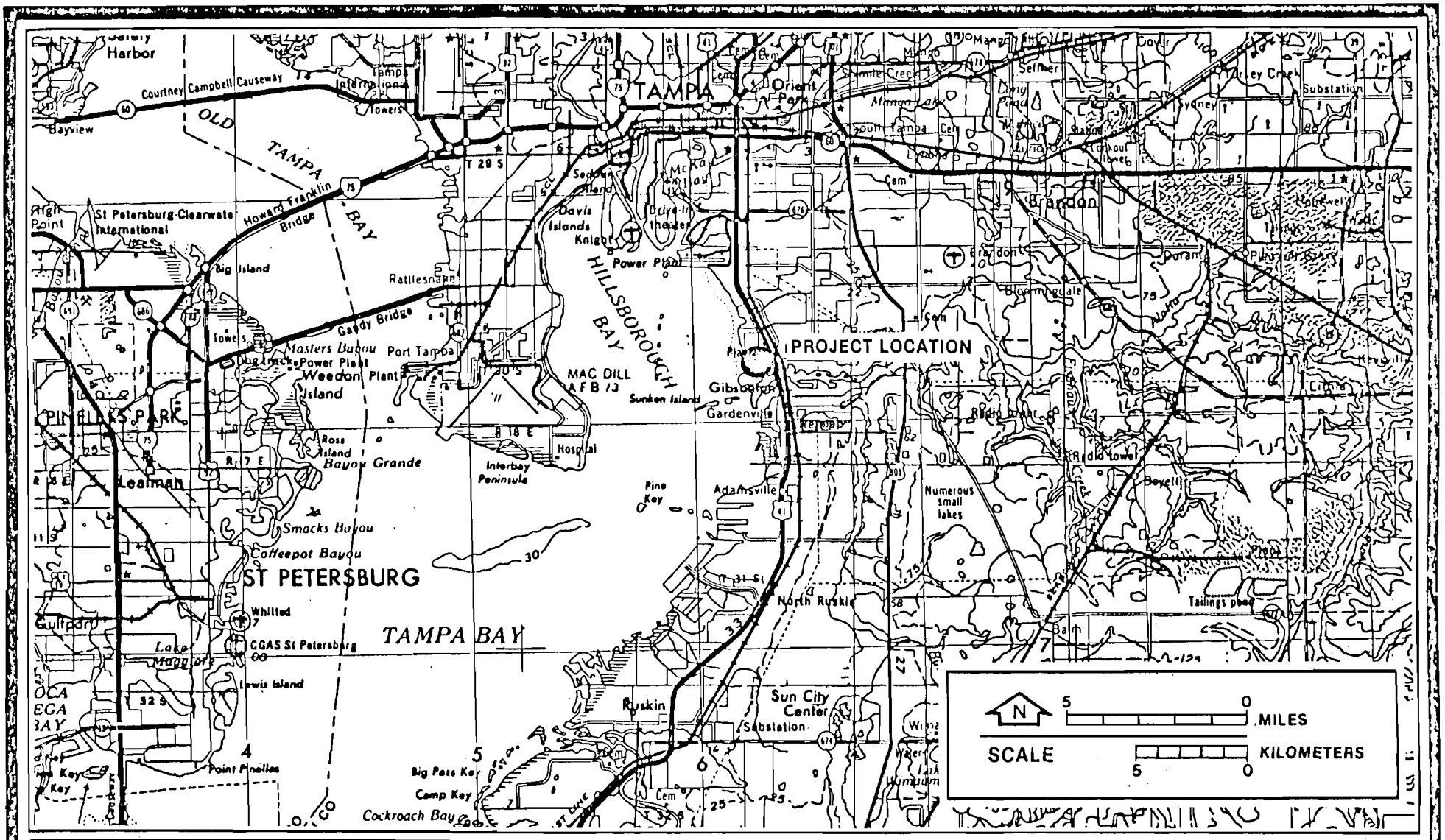


Figure 1-1
GENERAL LOCATION MAP OF GARDINIER, INC.

SOURCE: USGS, 1972.

GARDINIER, INC.
TAMPA, FLORIDA

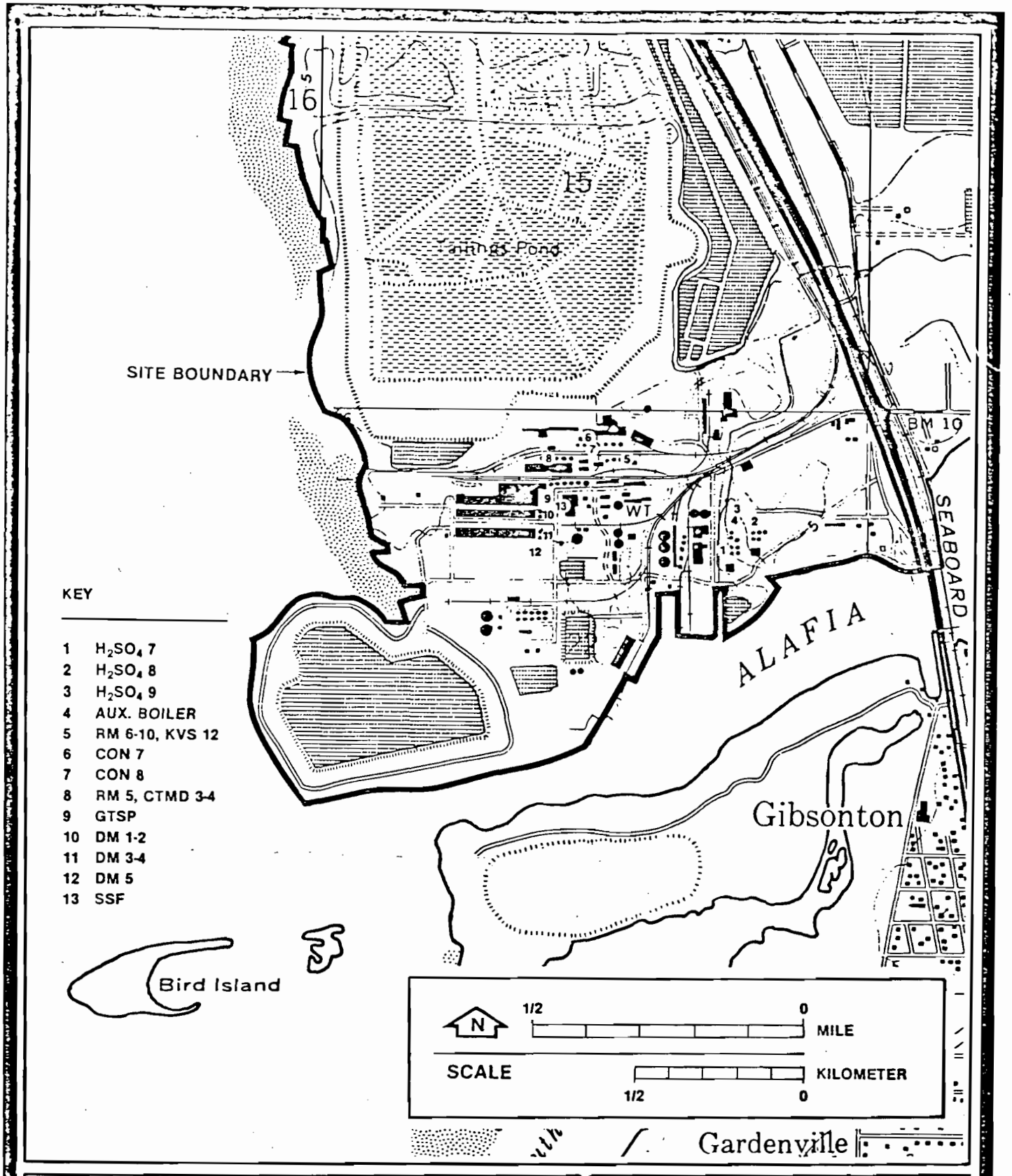


Figure 1-2
SITE LOCATION MAP OF GARDINIER, INC.

SOURCE: USGS, 1981.

GARDINIER, INC.
TAMPA, FLORIDA

GARDINIER INC.

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

-C-E-R-T-I-F-I-C-A-T-E-

I, Robert C. Guthrie, Secretary of GARDINIER, INC. a Delaware Corporation (hereinafter called the "Corporation"), DO HEREBY CERTIFY that attached hereto is a correct and complete copy of a resolution duly adopted by the Board of Directors of the Corporation at the Regular Meeting thereof held on July 13, 1982, duly convened and held pursuant to notice, at which meeting a quorum was present and acting throughout, and such resolution has not been amended or revoked and such resolution is now in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand this day of January 4, 1983.

Robert C. Guthrie

Robert C. Guthrie
Secretary

RESOLVED THAT Mr. Pearce A. Nelson and/or Mr. Rudy J. Cabina, or either of them be and each hereby is, appointed as the authorized representative of GARDINIER, INC. to execute the applications for permits to operate/construct pollution sources.

State of Florida

Department of State

I certify from the records of this office that GARDINIER, INC., a Delaware corporation, is authorized to transact business within the State of Florida, qualified on February 15, 1973.

The charter number for this corporation is 829527.

I further certify that said corporation has filed all annual reports and paid all annual report filing fees due this office through December 31, 1982, and its status is active.

Given under my hand and the Great Seal of the State of Florida, at Tallahassee, the Capital, this the 25th day of January, 1983.

George Firestone
Secretary of State

CER 101

GARDINIER, INC. TAMPA, FLORIDA

CHECK NO. 065871

66-798
531

DATE MO.	DAY	YR.
5	28	84

PAY EXACTLY ******1,000 DOLLARS AND 00 CENTS

DOLLARS	CENTS
$******1,000	00

VOID 90 DAYS AFTER CHECK DATE

TO THE ORDER OF
FLORIDA DEPARTMENT OF
ENVIRONMENTAL REGULATION
7601 HIGHWAY 301
TAMPA FL 33610

PAYABLE AT
NCNB NATIONAL BANK OF FLORIDA
TAMPA, FLORIDA
OR PAYABLE AT
NCNB NATIONAL BANK OF NORTH CAROLINA
ASHEVILLE, N.C.

[redacted]

[redacted]

GARDINIER, INC. TAMPA, FLORIDA

CHECK NO. 066063

66-798
531

DATE MO.	DAY	YR.
5	30	84

PAY EXACTLY ********170 DOLLARS AND 00 CENTS

DOLLARS	CENTS
$********170	00

VOID 90 DAYS AFTER CHECK DATE

TO THE ORDER OF
HILLSBOROUGH COUNTY ENVIRONMENTAL PROTECTION COMMISSION
1900 9TH AVENUE
TAMPA FL 33605

PAYABLE AT
NCNB NATIONAL BANK OF FLORIDA
TAMPA, FLORIDA
OR PAYABLE AT
NCNB NATIONAL BANK OF NORTH CAROLINA
ASHEVILLE, N.C.

[redacted]

AIR QUALITY IMPACT ASSESSMENT NO. 7 AND NO. 8 SULFURIC ACID PLANT EXPANSION

GARDINIER, INC.
TAMPA, FLORIDA

Prepared for:

GARDINIER, INC.,
Tampa, Florida

Prepared by:

ENVIRONMENTAL SCIENCE AND ENGINEERING, INC.
Gainesville, Florida

ESE No. 83-157-0100

January 13, 1984

ESE

ENVIRONMENTAL SCIENCE AND ENGINEERING, INC.

January 13, 1984
ESE No. 83-157-0100

Mr. Al Morrison
U.S. 41 South and Riverview Drive
Gardinier, Inc.
Tampa, Florida 33601

Dear Al:

Please find enclosed two copies of the draft air quality impact assessment for the proposed No. 7 and No. 8 H_2SO_4 plants' expansion. Please review the report and provide any comments. ESE will retain the computer model printouts until submittal of the document to DER.

Please call at your earliest convenience after review of the report.

Sincerely,

David A. Buff

David A. Buff, P.E.
Senior Engineer

DAB:jgh

Enclosures

TABLE OF CONTENTS

TABLE OF CONTENTS
(Continued, Page 2 of 2)

LIST OF TABLES

LIST OF TABLES
(Continued, Page 2 of 2)

LIST OF FIGURES

1.0 PROJECT DESCRIPTION

Gardinier, Inc. of Tampa, Florida, is proposing to expand the production capacities of the No. 7 and No. 8 Sulfuric Acid (H_2SO_4) plants at the Tampa phosphate fertilizer complex. The No. 7 H_2SO_4 is currently permitted to produce 1,750 tons per day (TPD) of H_2SO_4, and No. 8 H_2SO_4 is permitted for 1,770 TPD H_2SO_4. It is proposed to increase the H_2SO_4 production capabilities of both of these plants to 2,200 TPD. These increases in production will be accomplished by modifying the drying tower acid drain system, the second catalyst mass performance, and the final absorbing tower cooling system on both H_2SO_4 plants.

Phosphate fertilizers are manufactured at the Gardinier plant. Sulfuric acid is used to derive phosphoric acid from mined phosphate rock. The Gardinier plant currently does not have sufficient H_2SO_4 production capabilities to meet phosphoric acid production and phosphate fertilizer production capacities, capacities which are allowed under existing air pollution permits for those specific facilities. Expansion of the No. 7 and No. 8 H_2SO_4 plants will allow future demands to be met and allow the capacities of the H_2SO_4 plants to match the remainder of the facility.

The Gardinier Tampa plant is located south of Tampa on Hillsborough Bay (Figures 1-1 and 1-2). The surrounding land area is rural in nature. Other significant air pollution sources are located nearby, including the Tampa Electric Company (TEC) Big Bend, Hookers Point, and Gannon generating stations.

The only pollutants emitted by the No. 7 and No. 8 H_2SO_4 plants are sulfur dioxide (SO_2) and sulfuric acid mist (H_2SO_4 mist). As a result, these are also the only pollutants affected by the proposed expansion of these plants. The H_2SO_4 plants are the only H_2SO_4 mist-emitting sources at the Gardinier plant. However, several other SO_2 sources exist which result from fuel oil burning. The majority of these sources do not have any emission limit or allowable emission rate for

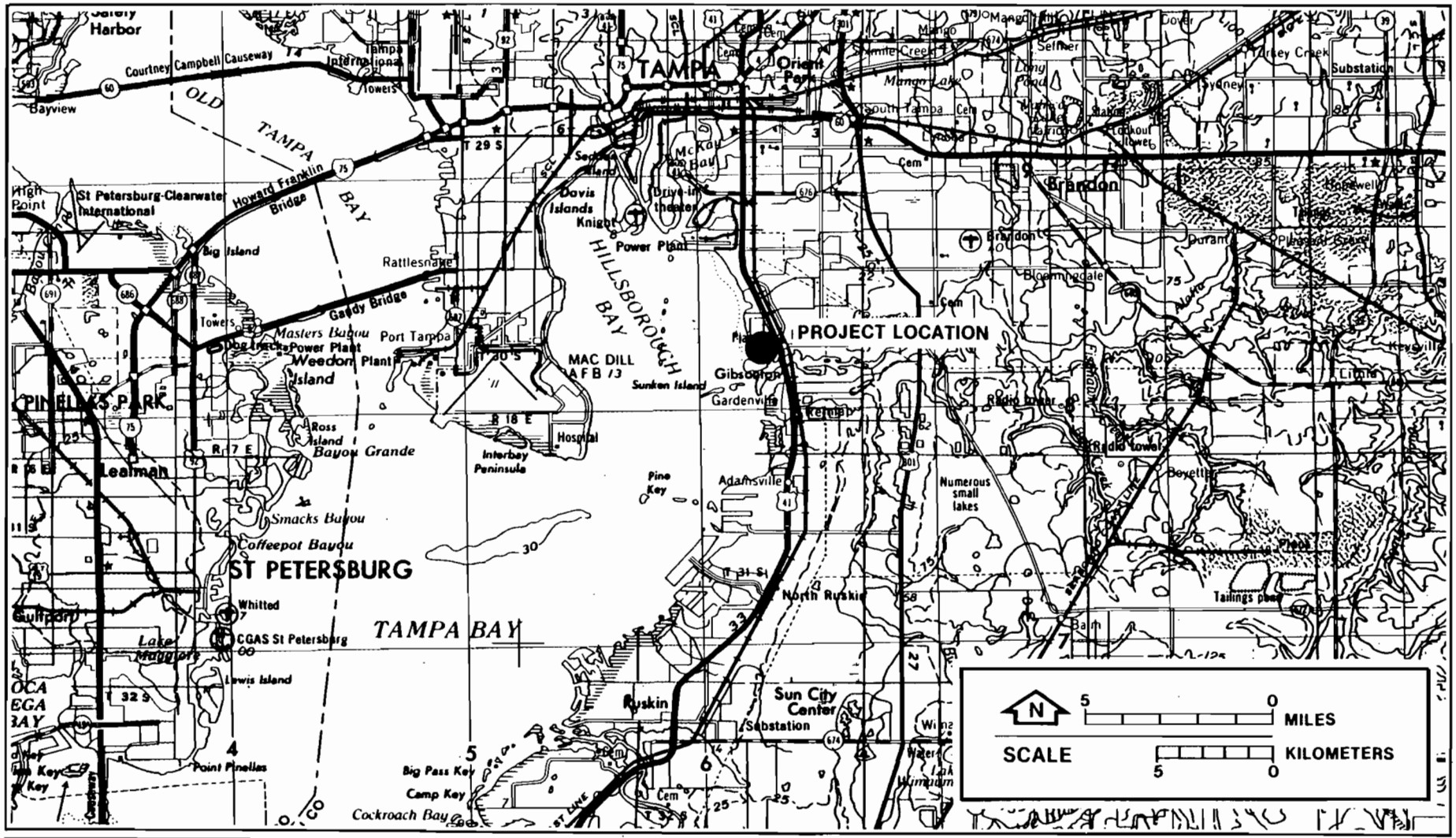


Figure 1-1
GENERAL LOCATION MAP OF GARDINIER, INC.

SOURCE: USGS, 1972.

GARDINIER, INC.
TAMPA, FLORIDA

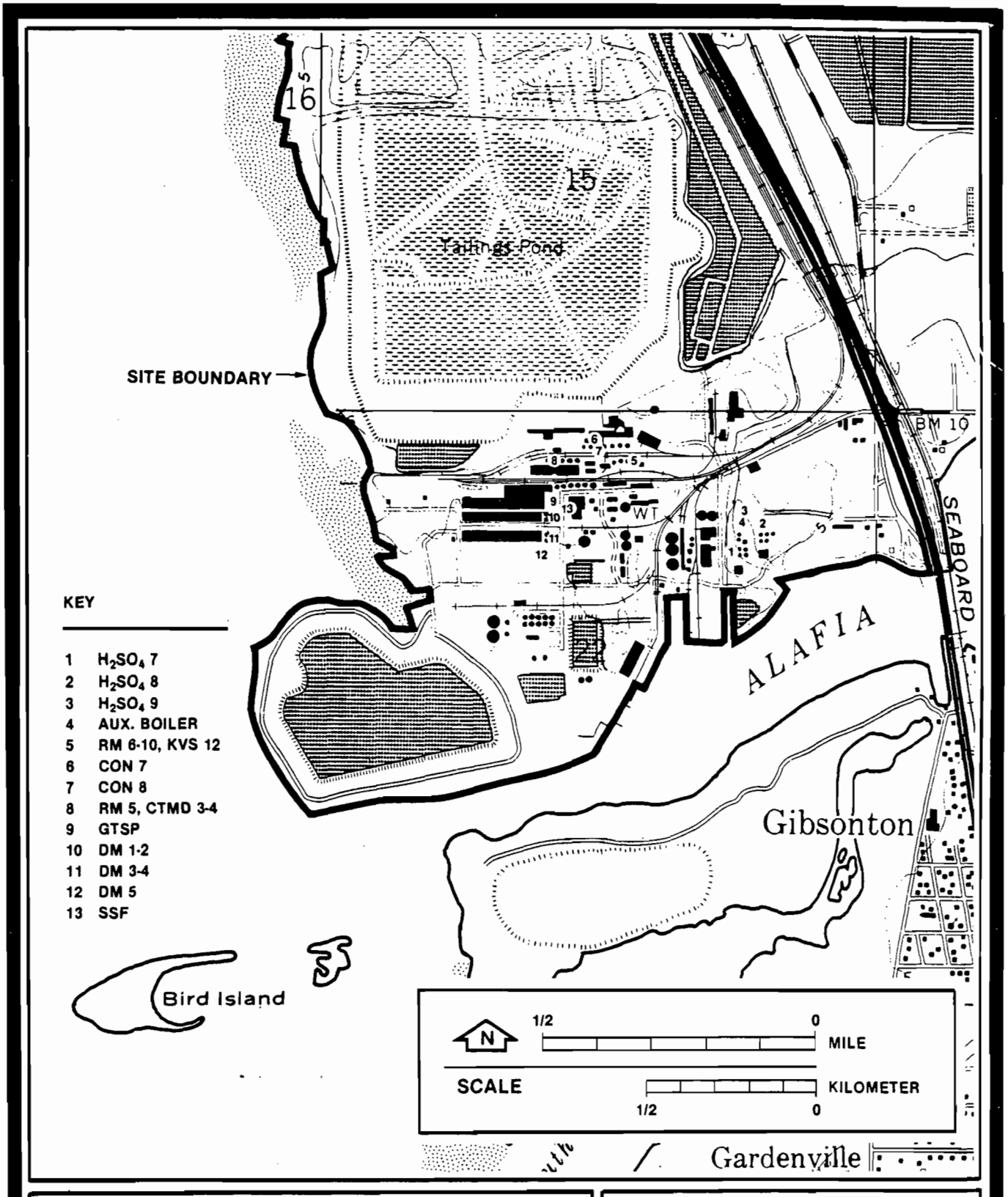


Figure 1-2
SITE LOCATION MAP OF GARDINIER, INC.

SOURCE: USGS, 1981.

GARDINIER, INC.
TAMPA, FLORIDA

SO_2. Shown in Table 1-1 are the calculated SO_2 emissions from each source other than H_2SO_4 plants based on the rated heat input (10^6 Btu/hr) and the type oil fired. In determining the fuel oil heating values and sulfur contents, the Air Pollutant Emissions Reports (APER) submitted annually to the Florida Department of Environmental Regulation (DER) were reviewed for the years 1975 through 1982. The worst-case oil from any year, in terms of SO_2 emitting potential, was used to develop the emission rates in Table 1-1. Many of the fuel-burning sources can use and have historically used natural gas. Price and availability dictate which fuel is used. The values in Table 1-1 reflect all fuel oil burning, which is the worst-case for SO_2 emissions.

The No. 5 diammonium phosphate plant SO_2 emissions are limited by permit condition to 10 pounds per hour (lb/hr). It is noted that Table 1-1 does not include two permitted sources of SO_2 emissions. The first is the ammonia (NH_3) plant, since it is currently shutdown and will remain so in the future. The second is the Auxiliary Boiler. This boiler will operate only when one of the H_2SO_4 plants is shutdown, and therefore will operate very infrequently. In addition, maximum SO_2 emissions from the Auxiliary Boiler would be only 55.6 lb/hr, which is much lower than the emissions from any one of the H_2SO_4 plants.

Stack parameters and emissions for all SO_2 sources to be operating in the future at Gardinier, including the expanded No. 7 and No. 8 H_2SO_4 plants, are presented in Table 1-2. The locations of the various sources within the Gardinier complex are shown in Figure 1-2. The No. 7 and No. 8 H_2SO_4 plants emissions are based upon 2,200 TPD H_2SO_4 production for each, with No. 7 at 4 lb SO_2/ton H_2SO_4 produced and No. 8 at 10 lb/ton. No. 9 H_2SO_4 plant emissions are based upon 2,631 TPD H_2SO_4 and 4 lb SO_2/ton. Stack parameters for the H_2SO_4 plants are based upon the source tests described in the footnotes to Table 1-2. No modifications will be made to the existing stacks serving the No. 7 and No. 8 H_2SO_4 plants.

Table 1-1. Maximum SO_2 Emissions from Fuel-Burning Sources at Gardinier

Source	Unit Code	Maximum Heat Input (10^6 Btu/hr)	Type Oil	Maximum Gallons Per Hour*	Maximum SO_2 Emissions* (lb/hr)
No. 12 Mill	KVS 12	3.0	#2	22.9	1.3
No. 5 Mill	RM 5	0.2	#2	1.5	0.084
Nos. 6-10 Mills	RM 6-10	0.9	#2	6.9	0.39
No. 7 Concentrator	CONC 7	30	#6	202.7	85.3
No. 8 Concentrator	CONC 8	30	#6	202.7	85.3
No. 3 Triple Dryer	CTMD 3	13.5	#6	91.2	38.4
No. 4 Triple Dryer	CTMD 4	13.5	#6	91.2	38.4
Granular Triple Super Phosphate	GTSP	40	#6	270.3	113.7
Nos. 1 and 2 Diammonium phosphate**	DM 1-2	3.6	#2	27.5	1.54
Nos. 3 and 4 Diammonium phosphate**	DM 3-4	3.6	#2	27.5	1.54
No. 5 Diammonium phosphate	DM 5	--	#2	--	10.0†
Sodium Fluosilicate	SSF	1.3	#2	9.9	0.55

* Calculated based upon worst-case fuel from 1975-1982 of: 2.63% S--148,000 Btu/gal for No. 6 oil (1980); 0.35% S--130,853 Btu/gal for No. 2 oil (1977). Assumes 8.0 lb/gal for both No. 6 and No. 2 fuels.

† Based upon PSD permit (PSD-FL-026) of July 11, 1980.

** Values represent total of both sources.

Source: ESE, 1983.

Table 1-2. Maximum SO_2 Emissions and Stack Parameters for Gardinier After Proposed Expansion

Unit Code	Maximum SO_2 Emission Rate (g/s)	Height (m)	Diameter (m)	Velocity (m/s)	Temperature (K)	UTM Coordinates (km) X	UTM Coordinates (km) Y
KVS 12	0.16	21.6	0.49	21.5	333	362.90	3082.60
RM 5	0.01	20.1	0.61	14.9	336	362.65	3082.60
RM 6-10	0.049	29.0	0.61	29.1	339	362.90	3082.60
CON 7	10.75	23.8	1.83	5.8	347	362.80	3082.70
CON 8	10.75	23.8	1.83	5.8	344	362.80	3082.70
CTMD 3	4.84	20.7	1.07	10.7	316	362.65	3082.60
CTMD 4	4.84	20.7	1.07	12.2	316	362.65	3082.60
GTSP	14.3	38.4	2.44	11.0	327	362.60	3082.45
DM 1,2*	0.19	27.4	1.22	16.8	336	362.60	3082.40
DM 3,4*	0.19	27.4	1.07	20.4	336	362.60	3082.30
DM 5	3.05	40.4	2.13	16.0	314	362.60	3082.25
SSF	0.069	12.2	0.51	9.1	322	362.75	3082.45
H_2SO_4 7†	46.2	45.6	2.29	13.1	339	363.20	3082.30
H_2SO_4 8†	115.5	45.6	2.44	11.5	339	363.30	3082.40
H_2SO_4 9**	55.3	45.6	2.74	10.0	347	363.20	3082.45

* Emissions represent total for both plants; stack parameters represent individual plants.

† Emissions based upon 2,200 TPD H_2SO_4 and 4 lb SO_2/ton for No. 7 H_2SO_4, 10 lb/ton for No. 8 H_2SO_4. Stack parameters based on source test of 5/19/82 for No. 7 which reflected production rate of 88.8 tons per hour, i.e., closest to 91.7 TPH (= 2,200 TPD); ACFM = 113,500. Stack temperature = 151°F.

** Emissions based upon 2,631 TPD H_2SO_4 and 4 lb SO_2/ton. Stack parameters based upon stack test of 1/18/83, with 108.8 TPH production (Permit = 108.3 TPH); ACFM = 124,700; stack temperature = 165°F.

Source: ESE, 1983.

Stack parameters for all other SO_2 sources were obtained from review of the APER submitted yearly to DER, and generally represent average values. SO_2 emissions represent maximum values due to fuel oil burning, as presented in Table 1-1.

2.0 AIR QUALITY REVIEW REQUIREMENTS AND SOURCE APPLICABILITY

The following discussions pertain to the regulatory requirements that must be met for the construction and operation of the expanded No. 7 and No. 8 H_2SO_4 plants, as required by federal and state PSD regulations and other air quality regulations.

2.1 NATIONAL AND STATE AAQS

As a result of the requirements of the 1970 CAA Amendments, EPA enacted primary and secondary national AAQS (Federal Register, 1971) for six air pollutants. Primary national AAQS are required to protect the public health, and secondary national AAQS are required to protect the public welfare from any known or anticipated adverse effects associated with the presence of pollutants in the ambient air.

Table 2-1 presents the existing applicable national and State of Florida AAQS for SO_2. Since the original standards were issued in 1971, EPA eliminated the annual and 24-hour secondary AAQS for SO_2. Prior to these changes, the State of Florida promulgated the secondary national AAQS for SO_2 as the state AAQS. Since states have the authority to adopt AAQS more stringent than those established by EPA, the State of Florida has chosen to retain the secondary AAQS for SO_2 which were eliminated by EPA. Pollutants for which AAQS have been established are called "criteria" pollutants.

Areas of the country shown to be in violation of AAQS are designated as nonattainment areas, and new sources to be located in or near these areas may be subject to more stringent air permitting requirements. The only area of the state designated as nonattainment for SO_2 by EPA (Federal Register, March 3, 1978) and the State of Florida (Ch 17-2, FAC, 1982) is the northwest corner of Pinellas County.

The Gardinier plant is located in Hillsborough County, which is designated as attainment for all pollutants, except particulate matter and ozone. The SO_2 nonattainment area is located 44 km to the

Table 2-1. Federal and State AAQS for SO_2

Pollutant	Averaging Time	Federal		State of Florida
		Primary Standard	Secondary Standard	
Sulfur Dioxide	Annual Arithmetic Mean	80	N/A	60
	24-Hour Maximum*	365	N/A	260
	3-Hour Maximum*	N/A	1,300	1,300

* Maximum concentration not to be exceeded more than once per year.

Sources: 40 CFR, Parts 50 and 52.
Ch 17-2, FAC.

northwest of the Gardinier plant site. Current DER regulations provide that the Pinellas County SO_2 nonattainment area will become attainment by March 31, 1984 (FAC, Chapter 17-2.410). This date is prior to the start-up dates of the expanded No. 7 and No. 8 sulfuric acid plants; therefore, no analysis of SO_2 impacts upon the nonattainment area was conducted.

2.2 FEDERAL AND STATE PSD

2.2.1 General Requirements

Under federal PSD review requirements, all major new or modified sources of air pollutants regulated under CAA must be reviewed and approved by EPA (or in this case, reviewed by DER since review authority has been delegated to the state: Federal Register, Vol. 48, No. 226, November 22, 1983). A "major stationary source" is defined as any one of 28 named source categories which has the potential to emit 100 TPY or more, or any other stationary source which has the potential to emit 250 TPY or more, of any pollutant regulated under CAA. "Potential to emit" means the capability at maximum design capacity to emit a pollutant after the application of control equipment.

"Major modification" means any physical change in the design or operation of a major stationary source, or a series of contemporaneous changes in the design or operation of a major stationary source, that would result in a significant net emission increase of any pollutant regulated under CAA. "Significant" is defined as any increase in emissions in excess of specified levels (Table 2-2).

PSD review is used to determine whether significant air quality deterioration will result from the new or modified source. PSD requirements are contained in 40 CFR 52.21, Prevention of Significant Deterioration of Air Quality, and in the State of Florida PSD Regulations (Ch 17-2, FAC). Major sources are required to undergo the

Table 2-2. Federal and State of Florida PSD Significant Emission Rates

Pollutant	Regulated Under	Federal and State Significant Emission Rate (TPY)
Sulfur Dioxide	NAAQS, NSPS	40
Particulate Matter	NAAQS, NSPS	25
Nitrogen Oxides	NAAQS, NSPS	40
Carbon Monoxide	NAAQS, NSPS	100
Ozone	NAAQS, NSPS	40*
Lead	NAAQS	0.6
Sulfuric Acid Mist	NSPS	7
Total Fluorides	NSPS	3
Total Reduced Sulfur	NSPS	10
Reduced Sulfur Compounds	NSPS	10
Hydrogen Sulfide	NSPS	10
Asbestos	NESHAP	0.007
Beryllium	NESHAP	0.0004
Mercury	NESHAP	0.1
Vinyl Chloride	NESHAP	1
Benzene	NESHAP	0
Radionuclides	NESHAP	0
Inorganic Arsenic	NESHAP	0
Any Regulated Pollutant	--	Class I Impact†

* Increase in Volatile Organic Compound emissions.
† Any emission rate for a source located within 10 km of a Class I area which causes impacts of 1 ug/m^3, 24-hour average, or greater.

Notes: TPY = Tons per year
NAAQS = National Ambient Air Quality Standards.
NSPS = New Source Performance Standards.
NESHAP = National Emission Standards for Hazardous Air Pollutants.

Sources: 40 CFR, Part 52.21.
Ch 17-2, FAC.

following reviews related to PSD for each pollutant emitted in significant amounts:

1. Control technology review,
2. Source impact analysis,
3. Air quality analysis (monitoring), and
4. Additional impact analyses.

Requirements for each of these areas are discussed in more detail below.

2.2.2 Increments/Classifications

Congress, in promulgating the 1977 CAA Amendments, specified that certain increases above an air quality "baseline concentration" level of SO_2 and PM concentrations would constitute significant deterioration. The magnitude of the increment that cannot be exceeded depends on the classification of the area in which a new source (or modification) will have an impact. Three classifications were designated based on criteria established in the CAA Amendments. Initially, Congress promulgated areas as Class I (international parks, national wilderness areas, and memorial parks larger than 5,000 acres; and national parks larger than 6,000 acres) or Class II (all other areas not designated as Class I). No Class III areas, which would be allowed greater deterioration than Class II areas, were designated. However, the states were given the authority to redesignate any Class II area to Class III status, provided certain requirements were met. EPA then promulgated as regulations the CAA Amendments requirements for classifications and area designations (Federal Register, August 7, 1977). The State of Florida has adopted the EPA class designations and allowable PSD increments (Table 2-3).

The term "baseline concentration" evolves from federal and state PSD regulations and denotes a fictitious concentration level corresponding to a specified baseline date and certain additional baseline sources. The baseline concentration is comprised of the predicted impact of the baseline emissions and a representative background concentration, which

Table 2-3. Federal* and State† PSD Allowable Increments

Pollutant/Averaging Time	Allowable Increment (ug/m^3) Class I	Class II	Class III
Particulate Matter			
Annual Geometric Mean	5	19	37
24-Hour Maximum**	10	37	75
Sulfur Dioxide			
Annual Arithmetic Mean	2	20	40
24-Hour Maximum**	5	91	182
3-Hour Maximum**	25	512	700

* 40 CFR Part 52, Section 52.21.
† Ch 17-2, FAC.
**Maximum concentration not to be exceeded more than once per year.

Source: ESE, 1983.

refers to concentration levels due to sources not accounted for in the point source emission inventories (i.e., natural and distant manmade sources).

Within Florida, there are four Class I areas: Everglades National Park, Chassahowitzka National Wilderness Area, St. Marks National Wilderness Area, and Bradwell Bay Wilderness Area. All of these Class I areas are more than 100 km from the Gardinier plant site, except for the Chassahowitzka Class I area, which is located approximately 85 km to the north. All other areas of the state classified as attainment or unclassifiable are designated Class II areas.

2.2.3 Control Technology Review

The control technology review requirements of the federal PSD regulations stipulate that all applicable federal and state emission-limiting standards be met, and that BACT be applied to control emissions from the source. The BACT requirements are applicable to all pollutants for which the increase in emissions from the source or modification exceeds the significant emission rate (see Table 2-2).

Under EPA's implementation of the CAA Amendments, the basic control technology requirement is the application and evaluation of BACT. BACT is defined as follows [40 CFR 52.21(b)(12)]:

> An emission limitation...based on the maximum degree of reduction for each pollutant...which would be emitted from any proposed major stationary source or major modification which the Administrator, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable... for control of such pollutant.

In December 1978, EPA's Office of Air, Noise, and Radiation published Guidelines for the Evaluation of BACT to assist states and EPA Regional Offices in making BACT determinations. The BACT requirements are intended to ensure that the control systems incorporated in the design of a proposed facility reflect the latest in control technologies used in a particular industry and take into consideration existing and future

air quality in the vicinity of the proposed facility. BACT must, as a minimum, demonstrate compliance with state emission limits. An evaluation of the air pollution control techniques and systems, including a cost-benefit analysis of alternative control technologies capable of achieving a higher degree of emission reduction than the chosen technology, is also required. The cost-benefit analysis requires the documentation of the materials, energy, and economic penalties associated with the proposed and alternative control systems as well as the environmental benefits derived from these systems.

2.2.4 Air Quality Analysis

In accordance with requirements of 40 CFR 52.21(m), any application for a PSD permit must contain, for each pollutant regulated under CAA, an analysis of continuous ambient air quality data in the area affected by the proposed major stationary source or major modification. For a new major source, the affected pollutants are those that the source would potentially emit in a significant amount.

According to CAA, ambient air monitoring for a period of up to 1 year generally is appropriate to complete the PSD requirements of CAA. Existing data from the vicinity of the proposed source may be utilized, if the data meet certain quality assurance requirements; otherwise, additional data may need to be gathered. Guidance in designing a PSD monitoring network is provided in EPA's Ambient Monitoring Guidelines for Prevention of Significant Deterioration (EPA, November 1980).

The regulations include an exemption which excludes or limits the pollutants for which an air quality analysis is conducted. This exemption states that the Administrator may exempt a proposed major stationary source or major modification from the monitoring requirements of 40 CFR 52.21(m) with respect to a particular pollutant if the emissions increase of the pollutant from the source or modification would cause, in any area, air quality impacts less than the federal de minimis levels presented in Table 2-4.

Table 2-4. Federal and State of Florida PSD De Minimis Impact Levels

Pollutant	De Minimis Air Quality Impact Level (ug/m^3)		
	Code of Federal Regulations	EPA Ambient Monitoring Guidelines	State of Florida
Sulfur Dioxide	13, 24-hour	13, 24-hour	13, 24-hour
Particulate Matter	10, 24-hour	10, 24-hour	10, 24-hour
Nitrogen Oxides	14, annual	14, annual	14, annual
Carbon Monoxide	575, 8-hour	575, 8-hour	575, 8-hour
Ozone	100 tons/yr*	100 tons/yr*	100 tons/yr*
Lead	0.1, 24-hour	0.1, 3-month	0.1, 24-hour
Sulfuric Acid Mist	†	†	†
Total Fluorides	0.25, 24-hour	0.25, 24-hour	0.25, 24-hour
Total Reduced Sulfur	10, 1-hour	†	10, 1-hour
Reduced Sulfur Compounds	10, 1-hour	†	10, 1-hour
Hydrogen Sulfide	0.04, 1-hour	0.2, 1-hour	0.04, 1-hour
Asbestos	†	†	†
Beryllium	0.0005, 24-hour	0.001, 24-hour	0.0005, 24-hour
Mercury	0.25, 24-hour	0.25, 24-hour	0.25, 24-hour
Vinyl Chloride	15, 24-hour	15, 24-hour	15, 24-hour
Benzene	†	†	†
Radionuclides	†	†	†
Inorganic Arsenic	†	†	†

* Increase in VOC emissions.
† No ambient air measurement method; no monitoring required.

Sources: 40 CFR 52.21(i)(8).
FAC, Chapter 17-2.500.
Ambient Monitoring Guidelines for Prevention of Significant Deterioration, EPA, November 1980.

The State of Florida has passed similar PSD air quality analysis requirements. EPA and State of Florida de minimis air quality impact levels are currently identical. In February 1981, EPA revised the de minimis levels and averaging times for three of the pollutants in the "Ambient Monitoring Guidelines for PSD" (EPA, February 1981), as shown in Table 2-4. The averaging period for the de minimis level for lead was changed to 3 months, and the de minimis impact levels for beryllium and hydrogen sulfide were changed to 0.001 microgram per cubic meter (ug/m^3) and 0.2 ug/m^3, respectively. Those revisions, however, have not been incorporated into the Code of Federal Regulations, and, therefore, the original federal (and State of Florida) de minimis levels technically still apply.

2.2.5 Source Impact Analysis

A source impact analysis must be performed by a proposed major source subject to PSD for each pollutant for which the increase in emissions exceeds the significant emission rates (Table 2-2). The PSD regulations specifically require the use of atmospheric dispersion models in performing impact analysis, estimating baseline and future air quality levels, and determining compliance with AAQS and allowable PSD increments. Designated EPA models must normally be used in performing the impact analysis. Specific applications for other than EPA-approved models require EPA's consultation and prior approval. Guidance for the use and application of dispersion models is presented in the EPA publication, "Guideline on Air Quality Models" (EPA, 1978).

Various lengths of record for meteorological data can be utilized for impact analysis. A 5-year period can be used with corresponding evaluation of highest, second-highest short-term concentrations for comparison to AAQS or PSD increments. The term "highest, second-highest" refers to the highest of the second-highest concentrations at all receptors (i.e., the highest concentration at each receptor is discarded). The second-highest concentration is significant because short-term AAQS specify that the standard should not be exceeded at any

location more than once a year. If fewer than 5 years of meteorological data are used, the highest concentration at each receptor must be used.

2.2.6 Additional Impact Analysis

In addition to air quality impact analyses, federal PSD regulations require analyses of the impairment to visibility and the impacts on soils and vegetation that would occur as a result of the proposed source. These analyses are to be conducted primarily for PSD Class I areas. Impacts due to general commercial, residential, industrial, and other growth associated with the source must also be addressed. These analyses are required for each pollutant emitted in significant amounts.

2.2.7 Good Engineering Practice (GEP) Stack Height

The 1977 CAA Amendments require that the degree of emission limitation required for control of any pollutant not be affected by a stack height that exceeds GEP or any other dispersion technique. On February 8, 1982, EPA promulgated final stack height regulations (EPA, February 8, 1982). Guidelines were published by EPA in July 1981 to assist in the determination of the GEP stack height.

GEP stack height is defined as the highest of:

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

   $H_g = H + 1.5L$

   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).

"Nearby" is defined as a distance up to five times the lesser of the height or width dimension of a structure or terrain feature, but not greater than 0.5 mi. While 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 greater.

2.3 SOURCE APPLICABILITY

2.3.1 Pollutant Applicability

As described in Section 1.0, the only regulated pollutants affected by the proposed expansion are SO_2 and H_2SO_4 mist. Historic annual emissions of SO_2 from the Gardinier plant are shown in Table 2-5 for the last 2 calendar years (1981 and 1982). The emissions figures were obtained from the APER submitted annually by Gardinier to DER. As shown, total plant SO_2 emissions were nearly equal in 1981 and 1982 at about 1,820 tons per year. Since phosphate rock processing plants are one of the 28 listed source categories, and the Gardinier plant is a phosphate rock processing plant, the plant is an existing major source if emissions of any regulated pollutant exceed 100 tons per year. Emissions of SO_2 do exceed 100 tons per year and, therefore, the Gardinier plant is an existing major source for PSD purposes.

Review of Table 2-5 reveals that the H_2SO_4 plants produce the majority of SO_2 emissions (greater than 80 percent in either year). Emissions of SO_2 from sources other than the H_2SO_4 plants are dependent upon fuel type and quality. Many can use natural gas or fuel oil; price and availability during any particular year dictate the choice of fuel.

A major modification, as described in Section 2.2, is a significant increase in emissions of any regulated pollutant at a major stationary source. PSD review applies to each pollutant for which the increase in emissions exceeds the PSD significant emission rate (Table 2-2). Since emission increases at the Gardinier plant due to the proposed modifications will only occur at the No. 7 and No. 8 H_2SO_4 plants, only these sources were considered in determining the net emissions increase. Emissions from all other SO_2 sources will not exceed current permit

Table 2-5. Summary of SO_2 Emissions, Gardinier, Inc., 1981-1982

Unit Code	SO_2 Emissions (tons/yr) 1981	1982	Average 1981-1982
KVS 12	0.26	--	0.13
RM 5	0.24	0.10	0.27
RM 6-10	0.08	0.20	0.14
CONC 7	73.70	*	36.85
CONC 8	81.70	*	40.85
CTMD 3	18.38	0.88	9.63
CTMD 4	15.06	0.48	7.77
GTSP	109.80	11.90	60.85
DM 1-2	0.64	*	0.32
DM 3-4	0.42	<0.01	0.21
DM 5	16.40	9.22	12.81
SSF	0.75	0.06	0.41
Ammonia (NH_3)	1.40	3.91	2.66
Auxiliary Boiler	4.80	0.04	2.42
H_2SO_4 7	128.40	764.70	446.55
H_2SO_4 8	477.30	396.20	436.75
H_2SO_4 9	891.30	635.90	763.60
TOTAL	1,820.63	1,823.59	1,822.11†

* Unit did not operate.
† Sum may not equal total due to round-off error.

Source: Gardinier, Inc. Air Pollutant Emissions Reports to the DER, 1981, 1982.

conditions, although emissions may fluctuate below these levels depending upon phosphate fertilizer market conditions and fuel type and quality. Since such fluctuations constitute normal routine operation, they need not be considered in determining the net emissions increase [40 CFR 52.21(2)(i) and FAC 17-2.100(102)].

Current actual and allowable emissions, proposed allowable emissions, and the net increase in allowable emissions of SO_2 and H_2SO_4 mist from the No. 7 and No. 8 H_2SO_4 plants are shown in Table 2-6. Current actual emissions of both SO_2 and H_2SO_4 mist are well below allowable emissions. The net increase in both SO_2 and H_2SO_4 mist emissions are estimated to exceed the PSD significant emission rates. As a result, both of these pollutants are required to undergo the PSD review described in Section 2.2. The calculated net increase does not include offsets derived from the shutdown of the ammonia plant, but these offsets are minor (less than 3 tons per year) and would not change the pollutant applicability.

2.3.2 Emission Standards

The No. 7 H_2SO_4 plant is currently required to emit no more than 4 lb SO_2 per ton H_2SO_4 produced and 0.15 lb H_2SO_4 mist per ton H_2SO_4 produced. Emission limits for the No. 8 H_2SO_4 plant are 10 lb/ton for SO_2 and 0.30 lb/ton for H_2SO_4 mist. These emission limits will be retained after the expansion of the H_2SO_4 production capacities of these plants.

2.3.3 Increment Consumption

The PSD increments allow a specified amount of deterioration in air quality to occur as judged against a "baseline" air quality level. This baseline level must be established before PSD increment consumption due to a proposed modification can occur. The baseline date has been established by DER to be December 27, 1977, for the entire State of Florida. Several provisions exist in FAC 17-2.500(4) which identify emissions which affect PSD increment consumption. These provisions

Table 2-6. Net Emission Increases at Gardinier, Inc., Due to the Proposed Modification

	SO_2 (tons/yr)		H_2SO_4 Mist (tons/yr)	
	Actual*	Allowable	Actual*	Allowable
Current Emissions				
No. 7 H_2SO_4 @ 1,750 TPD	447	1,278 (4 lb/ton)	13.6	47.9 (0.15 lb/ton)
No. 8 H_2SO_4 @ 1,770 TPD	438	3,232 (10 lb/ton)	14.7	96.9 (0.30 lb/ton)
TOTALS	885	4,510	28.3	144.8
Proposed Emissions				
No. 7 H_2SO_4 @ 2,200 TPD	--	1,606 (4 lb/ton)	--	60.2 (0.15 lb/ton)
No. 8 H_2SO_4 @ 2,200 TPD	--	4,015 (10 lb/ton)	--	120.5 (0.30 lb/ton)
TOTALS		5,621		180.7
Net Increase	--	1,111	--	35.9
PSD Significant Emission Rate		40		7

* Average of 1981 and 1982 calendar years, from Air Pollutant Emissions Reports.

Source: ESE, 1984.

relate to emission increases and decreases at facilities which occurred due to construction commencing after January 6, 1975.

A review of the history of the Gardinier plant in regard to SO_2 emissions will allow a better understanding of the status of the facility in regard to PSD increment consumption. The permit history of the H_2SO_4 plants (Nos. 4 through 9) is shown in Table 2-7. The No. 7 and No. 8 H_2SO_4 plants were modified to double absorption prior to January 6, 1975 (i.e., construction permits were obtained before this date). In 1979, the No. 7 H_2SO_4 plant received a construction permit to increase capacity from 1,380 TPD to 1,750 TPD of H_2SO_4. In conjunction with this change, the allowable SO_2 emission level was reduced from 10 lb/ton to 4 lb/ton.

The original construction permit for the No. 9 H_2SO_4 plant was received prior to January 6, 1975. In October 1976, the older Nos. 4, 5, and 6 H_2SO_4 plants were permanently shutdown.

The SO_2 emission decreases and increases at the Gardinier H_2SO_4 plants which affect increment consumption, including the presently proposed expansion, are summarized in Table 2-8. Both actual and allowable emissions are shown, based upon a 100-percent capacity factor on all units. The post-January 6, 1975 capacity increases at the No. 7 H_2SO_4 plant represent increases in actual emissions which consume PSD increment. Although the allowable SO_2 emission rate was reduced from 10 lb/ton to 4 lb/ton, review of historic source test data (Appendix A) show that the unit had met the 4-lb/ton limit since converting to double adsorption in 1977. Thus, for purposes of calculating actual emissions changes from this unit, the 4-lb/ton factor was assumed for both prior to and after the change occurred.

The currently proposed increases in production capacity of the No. 7 and No. 8 H_2SO_4 plants will also represent post-January 6, 1975 emissions increases which consume PSD increments. The actual emissions for the

Table 2-7. Permit History of Sulfuric Acid Plants at Gardinier, Inc.

Permit No.	Date	Comments
No. 7 H_2SO_4		
AC 29-2391	11/25/74	Modify to double absorption plant
AO 29-5762	11/02/77	Operating permit for double absorption plant (1,380 TPD)
AO 29-22820	8/24/79	Renew operating permit
AC 29-21337	9/07/79	Modify to 1,750 TPD and reduce allowable SO_2 emissions to 4 lb/ton
AO 29-56993	9/10/82	Operating permit for 1,750 TPD expansion
No. 8 H_2SO_4		
AC 29-3290	11/25/74	Modify to double absorption plant
AO 29-2390	5/21/77	Operating permit for double absorption plant (1,784 TPD)
AO 29-18228	5/26/79	Renew operating permit (1,770 TPD)
No. 9 H_2SO_4		
AC 29-2391	11/25/74	Original construction permit for 2,600 TPD double absorption plant
AO 29-2391	3/29/77	Operating permit (2,800 TPD)
AO 29-16532	2/09/79	Renew operating permit (2,631 TPD)
Nos. 4, 5, and 6 H_2SO_4		
	October 1976	Units shutdown

Source: ESE, 1984.

No. 8 H_2SO_4 are based upon 4 lb/ton, since historic source test data (Appendix A) show that this level has been generally achieved.

The shutdown of the No. 4, No. 5, and No. 6 H_2SO_4 plants in 1976 represents post-January 6, 1975 emission decreases which expand the available PSD increments. The actual emissions for these units are based upon the last 2 years of operation (1975 through October 1976), as reported in the APER for 1975 and 1976.

The bottom line of Table 2-8 shows the net change in increment-affecting emissions at Gardinier, including the proposed expansions of the No. 7 and No. 8 H_2SO_4 plants. The results show large decreases in both actual and allowable SO_2 emissions. In addition to these changes in emissions, the stack heights of the No. 7 and No. 8 H_2SO_4 plants are currently 149.5 feet. The shutdown No. 4, No. 5, and No. 6 H_2SO_4 plants all had shorter stacks, ranging from 72 feet to 80 feet. Thus, the air quality impacts from the older units would be greater than for the No. 7 and No. 8 units, per ton of SO_2 emitted.

Changes to other SO_2-emitting sources at Gardinier since January 6, 1975, at Gardinier have been minimal and would not significantly affect the results shown in Table 2-8. These changes include the addition of the No. 5 diammonium phosphate plant (10 lb/hr, 44 tons per year), and the shutdown of the ammonia plant (less than 5 tons per year).

Based upon the above considerations, it is concluded that the proposed expansion of the No. 7 and No. 8 H_2SO_4 plants will not cause or contribute to any violation of the allowable SO_2 PSD increments. The Gardinier plant is not located in an area where the PSD increments are known to be violated. Emission reductions at Gardinier since January 6, 1975, provide greatly expanded PSD increments in the vicinity of the plant. These emission decreases are of such magnitude that no detailed modeling analysis is needed, either for the PSD Class II area

Table 2-8. Summary of SO_2 Emission Changes at Gardinier H_2SO_4 Plants Which Affect PSD Increment Consumption

Unit/Date	Change	Actual SO_2 (tons/yr)*	Allowable SO_2 (tons/yr)*
No. 7 H_2SO_4			
9/07/79	Increase capacity from 1,380 TPD to 1,750 TPD and reduce allowables from 10 lb/ton to 4 lb/ton	+270†	-1,241
Proposed	Increase capacity from 1,750 TPD to 2,200 TPD	+329†	+329
No. 8 H_2SO_4			
Proposed	Increase capacity from 1,770 TPD to 2,200 TPD at 10 lb/ton	+312†	+785
No. 4 H_2SO_4			
1976	Unit shutdown, 274 TPD @ 6,992 lb SO_2/day	-892**	-1,276
No. 5 H_2SO_4			
1976	Unit shutdown, 475 TPD @ 12,140 lb SO_2/day	-1,773**	-2,216
No. 6 H_2SO_4			
1976	Unit shutdown, 650 TPD @ 16,598 lb SO_2/day	-2,469**	-3,029
Net Change		-4,223	-6,648

* Based upon year-round, continuous operation. Negative numbers indicate emission decreases; positive numbers indicate emission increases.
† Based upon 4 lb/ton before and after increase in capacity.
** Average of last 2 years of operation (1975 and 1976) based upon Air Pollutant Emissions Reports.

Source: ESE, 1984.

surrounding the Gardinier site, or for the PSD Class I area located 85 km to the north of the site.

2.3.4 GEP Stack Height

The heights of the existing No. 7 and No. 8 H_2SO_4 plants are 149.5 feet (45.6 m). These existing stacks will not be modified as a result of the proposed expansion. These stack heights are less than the 65-m height allowed under the GEP stack height regulations and, therefore, the stacks will not exceed the GEP stack height.

2.3.5 Ambient Monitoring

An ambient monitoring analysis is presented in Section 4.0 for SO_2 to satisfy PSD preconstruction monitoring requirements. Currently, no ambient monitoring requirements exist for H_2SO_4 mist under PSD, as no acceptable ambient monitoring technique has been approved (see Table 2-4).

3.0 BEST AVAILABLE CONTROL TECHNOLOGY EVALUATION

The source applicability analysis for the proposed Gardinier H_2SO_4 plant expansion, presented in Section 2.0, identified SO_2 and H_2SO_4 mist as air pollutants requiring a BACT review under federal and state PSD regulations. The State of Florida has received review authority for the federal PSD program (Federal Register, Vol. 48, No. 226, November 22, 1983). As a result, Florida's PSD regulations and BACT requirements must be met by the proposed modification. DER defines BACT as follows [Ch 17-2.100(22), FAC]:

> 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 . . . Each BACT determination shall include applicable test methods or shall provide for determining compliance with the standard(s) by means which achieve equivalent results.

DER generally follows EPA's BACT guidelines in defining BACT. The remainder of this section describes the proposed BACT and emission limit for each pollutant subject to BACT. An analysis of alternative control technologies, including economic, energy, and environmental considerations, is also presented.

3.1 SULFUR DIOXIDE

3.1.1 Proposed SO_2 BACT

The No. 7 and No. 8 H_2SO_4 plants at Gardinier are double-absorption, 5-stage converter plants. SO_2 to H_2SO_4 conversion efficiency depends primarily on the number of converter stages and, to a lesser extent, on the amount of catalyst. No H_2SO_4 plant in the United States is known to currently have more than five converter stages. The double absorption, 5-stage converter plant is considered to be state of the art in reducing SO_2 emissions from H_2SO_4 plants and is already in operation at the No. 7 and No. 8 plants, and therefore this control technology is proposed as BACT for SO_2. The proposed BACT

SO_2 emission limit is the current allowable level of 4 lb/ton H_2SO_4 produced for No. 7 H_2SO_4 and 10 lb/ton for No. 8 H_2SO_4.

The SO_2 source test data presented in Appendix A show that the maximum SO_2 emission level measured from No. 7 H_2SO_4 is 2.97 lb/ton. Compliance test results (average of three consecutive individual tests) ranged from 0.43 to 2.63 lb/ton. The upper levels recorded approach the 4.0-lb/ton allowable emission level. As the catalyst beds in the H_2SO_4 plant age over time, the SO_2 conversion efficiency decreases. Thus, the source test data alone cannot reflect emission levels that the No. 7 H_2SO_4 plant can achieve in the future, and the 4-lb/ton allowable rate is the proposed BACT emission rate. In addition, day-to-day emission rates can vary due to fluctuations in process variables.

Source test data for the No. 8 H_2SO_4 plant (Appendix A) show individual SO_2 tests have ranged up to 6.20 lb/ton. Compliance test results have ranged from 0.73 lb/ton to 6.01 lb/ton, with two values exceeding the 4-lb/ton level. Because these SO_2 test results have shown greater variability and higher levels than those for the No. 7 H_2SO_4 plant, it is proposed to retain the current allowable emission limit on the No. 8 H_2SO_4 plant of 10 lb/ton as the BACT emission limit. Day-to-day variations in process variables and catalyst aging affects could cause SO_2 emissions to increase above the historic measured levels for this plant.

3.1.2 Alternative SO_2 Control Technologies

EPA's review of New Source Performance Standards (NSPS) for H_2SO_4 plants (MITRE Corp., 1979) presents a comprehensive assessment of the alternative control technologies applicable to SO_2 removal from H_2SO_4 plant tail gases. The study identified the double-absorption contact H_2SO_4 plant, sodium sulfite-bisulfite scrubbing, ammonia scrubbing, and molecular sieves as alternatives. The study concluded that the best demonstrated control technology to reduce SO_2

emissions is the double-absorption H_2SO_4 plant. Nearly all the H_2SO_4 plants built in the United States since 1971 have used the dual-absorption process, wherein two absorber stages are used instead of only one, as in the single-absorption process. SO_2 conversion efficiencies for the double-absorption plant range from 96 percent and up.

Reduction of SO_2 emissions below those currently achieved by the No. 7 and No. 8 H_2SO_4 double-absorption plants would require add-on control equipment, such as one of the flue gas desulfurization (FGD) processes described above. This would add considerable capital and operating costs to the present system, produce a waste disposal problem, and would not result in significant benefits to the environment. The proposed Gardinier expansion will increase allowable SO_2 emissions from the entire plant by less than 255 lb/hr. This represents only 12 percent of the total allowable SO_2 emissions the Gardinier plant will be permitted to emit after the expansion is completed (2,113 lb/hr).

The EPA NSPS review studied the SO_2 control alternative of replacing the catalyst bed in the dual-absorption plant more frequently than is normally practiced. Complete replacement of the first three beds of a 4-stage converter at a frequency three times greater than is normally practiced was estimated to result in a cost impact of $0.50/ton of H_2SO_4 produced. This was considered to be an unacceptable method because pretax profits to the plant could be reduced by 20 percent or more.

None of the available SO_2 control technologies is considered to be superior to the selected BACT, based on economic, energy, and environmental impacts. The chosen SO_2 BACT for the No. 7 and No. 8 H_2SO_4 plants is the currently operating double-absorption plant.

3.2 SULFURIC ACID MIST

3.2.1 Proposed H_2SO_4 Mist BACT

The No. 7 and No. 8 H_2SO_4 plants at Gardinier are currently equipped with Brinks vertical pad-type, high efficiency mist eliminators to control H_2SO_4 mist emissions. Current mist emission limits are 0.15 lb/ton for No. 7 and 0.3 lb/ton for No. 8. All H_2SO_4 plants operating in the United States in 1979 that were required to meet the NSPS level of 0.15 lb/ton used high efficiency mist eliminators, primarily of the vertical pad type. Acid mist emissions are primarily related to moisture levels in the sulfur feedstock and in the air fed to the furnace, and the efficiency of the mist eliminator. Since the No. 7 and No. 8 Gardinier H_2SO_4 plants currently use high efficiency mist eliminators, and these are considered to be the state-of-the-art control, they are proposed as BACT for H_2SO_4 mist emissions. The EPA NSPS review study (MITRE Corp., 1979) identified these types of mist eliminators as the best demonstrated control technology for H_2SO_4 emissions. The proposed BACT emission levels for H_2SO_4 mist are the current allowables for the units--0.15 lb/ton for No. 7 H_2SO_4 plant and 0.30 lb/ton for No. 8 H_2SO_4.

Review of the source test data presented in Appendix A shows that H_2SO_4 mist compliance test values ranged from 0.030 lb/ton to 0.130 lb/ton for the No. 7 H_2SO_4 plant. These data indicate that emissions can fluctuate significantly, due to the factors discussed previously, and can range up to the 0.15-lb/ton current allowable limit. Based on the source test data, no reduction in the allowable level is justified.

The source test data for No. 8 H_2SO_4 show similar results. Individual tests ranged up to 0.207 lb/ton, while compliance tests ranged from 0.035 to 0.174 lb/ton. Day-to-day fluctuations in process variables could cause emissions to approach the current allowable level

of 0.30 lb/ton, and no reduction in this level is warranted based on the available data.

3.2.2 Alternative H_2SO_4 Mist Control Technologies

EPA's review of the H_2SO_4 plant NSPS identified three types of fiber mist eliminators and an electrostatic precipitator (ESP) as control techniques for controlling H_2SO_4 mist emissions from H_2SO_4 plants. EPA chose the fiber mist eliminator as the best demonstrated technology for the following reasons:

1. No evidence exists that any new H_2SO_4 plants have installed ESPs to control mist emissions.
2. ESPs require a relatively large space for erection.
3. ESPs would have high capital and installation costs, as well as high operating costs as a result of high maintenance due to the acid environment in which the ESP would operate.

The three types of fiber mist eliminators identified as applicable to H_2SO_4 plants are the vertical tube, the vertical panel, and the horizontal pad filters. Source test data in the EPA review indicated that all of the types can meet the NSPS level of 0.15 lb/ton, and no one type is superior to the others, although the majority of plants use the vertical tube type. Therefore, it is concluded that the alternative filter types cannot achieve a degree of H_2SO_4 mist reduction that is significantly better than the vertical pad filters currently in use on the No. 7 and No. 8 H_2SO_4 plants. The selected BACT for control of H_2SO_4 mist emissions is the currently operating, high efficiency mist eliminators.

The proposed Gardinier H_2SO_4 expansion will increase allowable H_2SO_4 mist emissions by 8.2 lb/hr. This will result in only a 25-percent increase in current allowable H_2SO_4 emissions (33.1 lb/hr). A lower BACT emission limit would not result in significant benefits to the environment.

4.0 AIR QUALITY ANALYSIS

4.1 MONITORING REQUIREMENTS

The Clean Air Act Amendments of 1977 require that the owner or operator of any proposed major new source or major modification conduct ambient air monitoring for applicable pollutants. Monitoring must be conducted for a period of up to 1 year prior to submission of a construction permit application. As discussed in the source applicability section, Section 2.3, only SO_2 requires an air quality analysis to meet PSD preconstruction monitoring requirements for the proposed Gardinier expansion.

The EPA "Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD)" (EPA, 1980) sets forth guidelines for preconstruction monitoring. The guidelines allow the use of existing air quality data in lieu of additional air monitoring, if the existing data are "representative." Three criteria are used in determining if the data are representative: monitor location, quality of data, and currentness of data.

Gardinier desires to submit existing representative SO_2 air quality data in lieu of additional monitoring to satisfy the preconstruction requirements. The representativeness criteria are discussed in Section 4.2 for the available existing data.

4.2 EXISTING SO_2 AIR QUALITY DATA

The EPA Ambient Monitoring guidelines state that:

> If the proposed construction will be in an area of multisource emissions and basically flat terrain, then the proposed source or modification may propose the use of existing data at nearby monitor sites if either of the following criteria are met.
>
> 1. The existing monitor is within 10 km of the points of proposed emissions, or
> 2. The existing monitor is within or not farther than 1 km away from either the area(s) of the maximum air pollutant concentration from existing sources or the area(s) of the combined maximum impact from existing and proposed sources.

The Gardinier site is located in an area of multisource emissions (i.e., TEC Big Bend, Gannon, and Hookers Point, etc.) and flat terrain; therefore, the criteria presented above are applicable. Gardinier proposes to satisfy the first criterion, i.e., existing monitor located within 10 km of the proposed emissions. Presented in Table 4-1 is a summary of ambient SO_2 data available from 1981 through June 1983 for all monitors located within 10 km of the Gardinier site. A total of six stations is located within 10 km of Gardinier, four of which have continuous SO_2 monitors. Thus, the existing data satisfy the monitor location criterion.

The second criterion is data quality. The monitoring network is operated by the Hillsborough County Environmental Protection Commission and is believed to meet all quality assurance requirements. All data recoveries have exceeded the requirement of 80-percent recovery, as shown in Table 4-1.

The third criterion is the currentness of data. This generally means that the data have been gathered within the last 3 years, provided the data are still representative of current conditions. Since Table 4-1 presents the data available up to the present time (these monitors are currently operating), the data are considered to be representative of current conditions.

The data presented are considered to meet all of the requirements for PSD preconstruction monitoring. Gardinier is therefore submitting these data in lieu of additional monitoring.

4.3 BACKGROUND SO_2 CONCENTRATIONS

A background SO_2 concentration must be estimated to account for SO_2 sources which are not explicitly included in the atmospheric dispersion modeling analysis. The available ambient SO_2 data presented in Table 4-1 were used for this purpose.

Table 4-1. Summary of SO_2 Data for Sites Within 10 km of Gardinier, Inc.

SAROAD Site No. (Distance Away)	Monitoring Method	Period	No. of Obs.	Percent Data Recovery	SO_2 Concentration (ug/m_3) 3-Hour Max	3-Hour 2nd Max	24-Hour Max	24-Hour 2nd Max	Annual Average
1800-021	Continuous	1981	8,181	93.4	897	652	123	116	15
(8.2 km)		1982	7,714	88.1	693	629	160	125	15
		1983*	4,182	95.5	624	507	104	84	14
1800-066	Gas bubbler	1981	52	—	—	—	63	58	14
(3.9 km)		1982	51	—	—	—	39	24	8
		1983*	27	—	—	—	45	24	8
1800-083	Gas bubbler	1981	52	—	—	—	110	47	14
(G02)		1982	51	—	—	—	52	31	8
(0.6 km)		1983*	29	—	—	—	31	24	7
4360-035	Continuous	1981	7,655	87.4	293	291	116	116	28
(9.8 km)		1982	8,481	96.8	376	334	103	88	25
		1983*	4,287	97.9	327	265	85	77	18
4360-051	Continuous	1981	7,459	85.1	271	266	118	102	18
(8.6 km)		1982	8,615	98.3	452	327	117	97	24
		1983*	4,231	96.6	432	273	81	81	15
4360-053	Continuous	1981	7,754	88.5	219	217	64	60	14
(9.5 km)		1982	8,467	96.7	375	292	90	84	19
		1983*	4,307	98.3	225	199	69	58	15

* January through June only.
† Based upon 8,760 hr/yr.

Source: ESE, 1984.

Annual average, 24-hour maximums, and 3-hour maximums for SO_2 are shown in Table 4-1. Since all of the monitors are located in an area of multisource emissions, these concentrations are expected to include substantial contributions from sources in the area, including the existing Gardinier facility. Potential major contributing sources are also explicitly included in the modeling analysis. For the short-term averaging times, these concentrations would not be representative of background concentrations which would be expected to occur in conjunction with the worst-case meteorology. For the annual averaging time, the background concentration would be significantly lower than the values shown in Table 4-1.

A representative background SO_2 concentration was considered to be the highest annual average concentration recorded at monitoring site 1800-021. This value was 15 ug/m^3, recorded in both 1981 and 1982. Site 1800-021 is located 8.2 km southeast of Gardinier. TEC Big Bend power plant lies about 5 km due east of the site. These two sources are the only nearby sources of SO_2 that would directly influence the monitor. Therefore, the data from this site were considered to be more representative of the background concentration than the data from the other monitoring sites listed in Table 4-1, which could be impacted by a number of SO_2 sources.

The 15-ug/m^3 background SO_2 level was used for all averaging times and was added to dispersion modeling results, presented in Section 5.0, in order to estimate total air quality impacts. The highest and second-highest 3-hour and 24-hour concentrations reported for monitoring site 1800-021 in Table 4-1 are assumed to be due to either the Gardinier plant or the TEC Big Bend plant, and therefore were considered not to be representative of the short-term background concentration. Since all major SO_2 sources (i.e., greater than 25 TPY) located within 20 km of the Gardinier plant were considered in the dispersion modeling analysis, the 15-ug/m^3 annual average recorded at Station 1800-021 was also considered to be representative of the short-term background concentration level.

5.0 SOURCE IMPACT ANALYSIS

5.1 ANALYSIS APPROACH AND ASSUMPTIONS

5.1.1 General Modeling Approach

The general modeling approach followed EPA and DER modeling guidelines for determining compliance with AAQS. In general, when model predictions are used to determine compliance with AAQS, current EPA and DER policies stipulate that the highest annual average and highest or highest, second-highest short-term (i.e., 24 hours or less) concentrations must be compared to the applicable AAQS. If concentrations are predicted with only 1 year of meteorological data, the highest short-term concentration calculated among the field of receptors should be compared with AAQS. The use of a 5-year meteorological data base allows comparison of the predicted highest, second-highest short-term concentrations with short-term AAQS. The highest, second-highest concentration is calculated for a receptor field by:

1. Eliminating the highest concentration predicted at each receptor,
2. Identifying the second-highest concentration at each receptor, and
3. Selecting the highest concentration among these second-highest concentrations.

This approach is consistent with AAQS, which permits a short-term average concentration to be exceeded once per year at each receptor.

Model predictions for all averaging periods were performed using the Industrial Source Complex Short-Term (ISCST) model. A brief description of the ISCST model is given in Section 5.2. To develop the maximum short-term SO_2 concentrations for the proposed Gardinier expansion, the general modeling approach was divided into screening and refined phases to reduce the computation time required to model the emission points. The basic difference between the two phases is the receptor grid used when predicting concentrations, the number of emission points, and the number of meteorological periods evaluated. In general,

concentrations for the screening phase were predicted using a coarse receptor grid, limited number of major sources (i.e., sources with SO_2 emissions of more than 250 tons per year), and a 5-year meteorological record. The highest and highest, second-highest short-term concentrations predicted over the field of receptors were then reviewed to ensure the hourly concentrations were predicted during valid meteorological conditions (e.g., non-calm wind conditions).

After a final list of highest, second-highest short-term concentrations was developed, the refined phase of the analysis was conducted by predicting concentrations for a refined receptor grid centered on the receptor at which the highest, second-highest concentration from the screening phase was produced. The ISCST model was run for the meteorological periods during which both the highest and second-highest concentrations were predicted to occur at that receptor, based on the screening phase results. This approach was used to ensure that valid highest, second-highest concentrations were obtained. More detailed descriptions of the emission inventory and receptor grids used in the screening and refined phases of the analysis are presented in Sections 5.1.4 and 5.1.5, respectively.

5.1.2 Model Selection

The ISC dispersion model (Cramer, 1979) was used to evaluate the SO_2 emissions from the Gardinier facility. This model is contained in EPA's User's Network for Applied Modeling of Air Pollution (UNAMAP), Version 5 (EPA, 1983). The ISC model was selected primarily for the following reasons:

1. EPA and DER have approved the general use of the model for air quality dispersion analyses because the model assumptions and methods are consistent with those in the Guideline on Air Quality Models (EPA, April 1978).
2. The ISC model is capable of predicting the impacts from stack, area, and volume sources that are spatially distributed

over large areas and located in flat or gently rolling terrain.

3. The results from the ISC model are appropriate for addressing compliance with AAQS.

The ISC model has rural and urban options which affect the plume rise formulas, wind speed profile exponent law, dispersion curves, and mixing height formulations used in calculating ground-level concentrations. One of the criteria used to determine when the rural or urban mode is appropriate is based on land use near the proposed plant (Auer, 1978). If the land use is classified as heavy industrial, light-moderate industrial, commercial, or compact residential for more than 50 percent of the area within a 3-km radius circle centered on the proposed source, the urban mode should be selected. Otherwise, the rural option is more appropriate. Based on a review of the land use around the Gardinier facility, the rural mode was selected because of the general lack of or minimal residential, industrial, and commercial development.

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

The second model code is the ISC long-term (ISCLT) model, which is an extension of the Air Quality Display Model (AQDM) and the Climatological Dispersion Model (CDM). The ISCLT model uses joint frequencies of wind direction, wind speed, and atmospheric stability to calculate seasonal and/or annual average ground-level concentrations. This model code was not used because the annual average concentrations were obtained from the ISCST model.

5.1.3 Meteorological Data

Meteorological data used in the ISCST model to determine air quality impacts consisted of a concurrent 5-year period of hourly surface weather observations from the NWS station at Tampa International Airport and twice-daily radiosonde soundings from the NWS station at Ruskin, Florida. The years of meteorological data consisted 1973, 1974, 1975, 1978, and 1979.

The NWS stations in Tampa, located approximately 18 km to the northwest of the Gardinier plant site, and Ruskin, located approximately 15 km to the south-southwest of the plant site, were selected for use in the study because they are the closest primary weather stations to the study area with similar surrounding topographical features and land-water boundaries. These stations also have the most readily available and complete data base which is representative of the proposed plant sites.

The surface observations included wind direction, wind speed, temperature, cloud cover, and cloud ceiling. The wind speed, cloud cover, and cloud ceiling values are used in the ISCST meteorological preprocessor program to determine atmospheric stability using the Turner stability scheme. Based on the temperature measurements at Tampa, Florida, morning and afternoon mixing heights were calculated with the radiosonde data at Ruskin using the Holzworth approach (1972). Hourly mixing heights were derived from the morning and afternoon mixing heights using the interpolation method developed by EPA (Holzworth, 1972). The hourly surface data and mixing heights were used to develop a sequential series

of hourly meteorological data (i.e., wind direction, wind speed, temperature, stability, and mixing heights). Because the observed hourly wind directions are classified into one of thirty-six 10-degree sectors, the wind directions are randomized within each sector using an EPA preprocessing program to account for the expected variability in air flow.

5.1.4 Emission Inventory

A listing of all sources considered in the modeling analyses for determining total air quality impacts is presented in Table 5-1. The emission and stack parameters for the Gardinier sources were presented in Table 1-2 in Section 1.0. The emission and stack parameters for all other sources were obtained from a previous ESE report for the coal reconversion at the TEC Gannon Units 1 through 4 (ESE, 1980), and discussions with personnel from DER and Hillsborough County Environmental Protection Commission.

To reduce the amount of computation time required to model these sources, including those at the Gardinier plant, the modeling was performed in screening and refined phases. The screening phase considered modeling only those sources with emissions above a certain threshold based on the source's location from the Gardinier plant. The following criteria were used to determine the sources to be modeled:

1. For Gardinier sources, individual point sources with emissions greater than or equal to 3.1 g/s (i.e., equivalent to 125 TPY).
2. For other sources, individual point sources with emissions greater than 7.2 g/s (i.e., equivalent to 250 TPY) within 20 km of the Gardinier sources.

For the screening modeling, Gardinier sources with similar stack heights and stack parameters were combined and treated as one stack to reduce computation time. The Gardinier screening emission inventory is listed in Table 5-2.

Table 5-1. SO_2 Emissions and Stack Parameters for All Sources Considered in the Modeling*

Sources	SO_2 Emissions (g/s)	Stack Height (m)	Stack Diameter (m)	Exit Gas Velocity (m/s)	Exit Gas Temperature (K)	UTM Coordinates (km) X	UTM Coordinates (km) Y
Tampa Electric Company							
Big Bend Units 1, 2	5,250†	149.35	7.3	28.7	423	361.6	3075.0
Big Bend Unit 3	2,690†	149.35	7.3	14.43	418	361.6	3075.0
Big Bend Unit 4	436	149.35	7.3	19.97	342	361.6	3075.0
Gannon Units 1, 2	760.2	93.3	3.05	32.4	438	360.0	3087.5
Gannon Unit 3	483.5	93.3	3.23	35.4	427	360.0	3087.5
Gannon Unit 4	567.3	93.3	2.93	24.6	443	360.0	3087.5
Gannon Unit 5	690.7	93.3	4.45	20.7	416	360.0	3087.5
Gannon Unit 6	1,148.5	93.3	5.40	23.4	439	360.0	3087.5
Hookers Point Units 1,2,5	167.0	85.3	3.43	18.2	403	358.0	3091.0
Hookers Point Units 3, 4	113.6	81.7	3.66	11.5	397	358.0	3091.0
Hookers Point Unit 6	107.1	85.3	2.89	17.9	436	358.0	3091.0
Chloride Metals							
50-01	13.0	30.2	0.6	22.9	398	361.8	3088.3
50-04	7.2	29.9	0.6	12.1	345	361.8	3088.3
General Portland							
18-04	81.0	36.0	2.7	17.7	505	358.0	3090.6
18-05	10.3	36.0	2.7	8.8	454	358.0	3090.6
Gulf Coast 57-01	10.3	29.6	0.6	29.1	344	363.9	3093.8
Tampa Water Pump							
9-01	1.79	38.1	2.5	6.9	589	360.0	3092.2
9-02	1.79	38.1	1.5	0.4	394	360.0	3092.2
Florida Steel 20-01	0.81	22.6	2.9	1.3	306	364.6	3094.2
Exxon 21-01	0.78	9.4	3.0	11.0	340	362.2	3087.2
IMC Corporation 24-01	3.62	13.1	0.3	9.7	349	360.1	3087.5
National Gypsum 28-01	3.92	27.1	0.3	8.3	374	347.4	3082.5
Nitram							
29-03	0.50	27.4	1.4	1.9	505	363.1	3089.0
29-04	2.62	27.4	1.4	10.8	505	363.1	3089.0
Thatcher Glass							
45-01	3.51	29.9	0.6	12.1	345	361.8	3088.3
45-02	1.56	30.2	0.6	22.9	398	361.8	3088.3

Table 5-1. SO_2 Emissions and Stack Parameters for All Sources Considered in the Modeling* (Continued, Page 2 of 2)

Sources	SO_2 Emissions (g/s)	Stack Height (m)	Stack Diameter (m)	Exit Gas Velocity (m/s)	Exit Gas Temperature (K)	UTM Coordinates (km) X	UTM Coordinates (km) Y
Sulfur Terminal 82-01, 02	1.5	9.1	0.6	5.9	592	358.0	3089.2
Comco							
Dryer	3.4	22.9	0.35	24.4	366	361.4	3086.9
Heater	0.55	12.2	0.36	8.66	561	361.4	3086.9
AMAX							
2-01, 02	90.7	61.0	2.4	10.3	337	348.5	3057.3
2-06, 07	3.1	61.0	2.1	20.5	311	348.5	3057.3
2-11	0.83	12.5	1.4	10.0	299	348.5	3057.3
FPL Manatee Units 1, 2	1,905	152.0	7.9	20.5	427	367.6	3055.1

* See text for details concerning those sources considered in the screening and refined analyses.
† SO_2 emissions are based on maximum allowable 3-hour emissions. For 24-hour average, maximum allowable SO_2 emissions Units 1 and 2 are 4,170 g/s and for Unit 3 is 2,130 g/s.

Source: ESE, 1984.

Table 5-2. Combined Gardinier Sources Used for Screening Modeling

Sources	SO_2 Emissions (g/s)	Stack Height (m)	Stack Diameter (m)	Exit Gas Velocity (m/s)	Exit Gas Temperature (K)	UTM Coordinates (km) X	Y
RM 5, CTMD 3, 4	9.69	20.7	1.07	11.5	316	362.65	3082.6
CON 7, 8	21.5	23.8	1.83	5.8	345	362.8	3082.7
GTSP	14.3	38.4	2.44	11.0	327	362.6	3082.45
H_2SO_4 7	46.2	45.6	2.29	13.1	339	363.2	3082.3
H_2SO_4 8	116.0	45.6	2.44	11.5	339	363.3	3082.4
H_2SO_4 9	55.3	45.6	2.74	10.0	347	363.2	3082.45

Source: ESE, 1984.

After the screening modeling was performed and the worst-case meteorological periods identified, all the sources shown in Table 5-1 and Gardinier sources shown in Table 1-2 were modeled using a refined receptor grid. This inventory includes all other sources with emissions greater than 0.72 g/s (i.e., 25 TPY) and located within 20 km of the Gardinier site. In addition, emissions from the Florida Power & Light Company (FPL) Manatee and AMAX facilities, located about 30 km from the Gardinier facility, were included in the modeling because of the magnitude of their emissions and the potential combined impacts with TEC Big Bend Units and Gardinier sources.

A summary of the number of sources and emissions considered in the screening and refined phases of the analysis is presented in Table 5-3. As shown in this table, 22 sources were modeled in the screening phase and represent almost 50 percent of all sources and 86 percent of all emissions considered in the refined analysis. For sources that were within 20 km of the Gardinier plant (i.e., excluding emissions from the AMAX and FPL Manatee facilities), the total emissions considered in the screening phase represent more than 99 percent of those used in the refined analysis. For the Gardinier sources, the emissions considered in the screening phase represent approximately 99 percent of all emissions from the Gardinier plant.

5.1.5 Receptor Grids

As discussed in Section 5.1.1, the general modeling approach considered screening and refined phases to address compliance with AAQS. For the screening phase, concentrations were predicted for three main receptor grids using a limited number of receptors and sources for each receptor grid. The locations of the receptor grids were based on identifying the areas in which the maximum concentrations would be expected due to the Gardinier sources only and due to the interaction of the Gardinier sources with other major sources of SO_2. For the screening phase, only those non-Gardinier sources with SO_2 emissions greater than

Table 5-3. Summary of SO_2 Sources Within 20 km of the Gardinier Facility Considered in the Screening and Refined Modeling

Sources	Screening Modeling		Refined Modeling	
	SO_2 Emissions (g/s)	Number of Emission Points	SO_2 Emissions (g/s)	Number of Emission Points
Gardinier	263.0	6*	266.2	15
Tampa Electric Company				
Big Bend	8,376.0†	3	8,376.0†	3
Gannon	3,650.2	5	3,650.2	5
Hooker's Point	387.7	3*	387.7	3*
Chloride Metals	20.2	2	20.2	2
General Portland	91.3	2	91.3	2
Gulf Coast	10.3	1	10.3	1
Tampa Water Pump	--	--	3.6	2
Florida Steel	--	--	0.8	1
Exxon	--	--	0.8	1
IMC Corporation	--	--	3.6	1
National Gypsum	--	--	3.9	1
Nitram	--	--	3.1	2
Thatcher Glass	--	--	5.1	2
Sulfur Terminal	--	--	1.5	1
Comco	--	--	4.0	2
AMAX**	--	--	94.6	3
FPL Manatee**	--	--	1,905.0	1
TOTAL ALL SOURCES	12,798.7	22	14,829.4	48

* Several emission points for these sources were combined in the modeling based upon similar stack parameters.

† Emissions for Units 1, 2, and 3 based on maximum allowed for 3 hours (32 tons per hour).

** These sources were more than 20 km from the Gardinier facility, but because of their emissions, were considered in the modeling analysis.

Source: ESE, 1984.

250 TPY and located within 20 km of the Gardinier facility were considered (see Section 5.1.4). A listing of the non-Gardinier SO_2 sources and their location with respect to the Gardinier facility are presented in Table 5-4. Because these major sources are located in distinct directions and more than 5 km from the Gardinier facility, not all of these sources were modeled for each of the three grids. Descriptions of the three receptor grids and major sources considered in each grid are as follows:

1. Receptor grid that consisted of 148 receptors located in the immediate vicinity of the Gardinier plant. These receptors were generally spaced at intervals of 200 to 400 m along the plant boundary lines and out to about 2 km from the plant boundary. Because other major sources are located either to the northwest or southwest of Gardinier (see Table 5-4), this receptor grid was divided into three receptor grids: north, south, and east-west. For the north receptor grid (77 receptors located in the immediate vicinity to the north of the Gardinier sources), emissions from only the Gardinier and the TEC Big Bend plants were considered in the modeling since the other major sources would not contribute to concentrations at these receptors for wind directions from the south that align the Gardinier sources with those at the Big Bend plant.

   For the south receptor grid (48 receptors located in the immediate vicinity to the south of the Gardinier sources), emissions from the TEC Gannon and Hookers Point, Chloride Metals, General Portland, Gulf Coast, and Gardinier facilities were considered in the modeling. Emissions from the TEC Big Bend facility are not expected to contribute to the maximum concentrations for wind directions from the north that align the Gardinier sources with these major sources.

   For the east-west receptor grid (23 receptors located in the immediate vicinity to the east and west of the Gardinier

Table 5-4. Major Sources* Within 20 km from the Gardinier Facility

Source	Location from the Gardinier Plant†	
	Direction (degrees)	Distance (km)
Tampa Electric Company		
Big Bend	191	7.6
Hookers Point	330	9.9
Gannon	329	5.8
Chloride Metals	348	5.9
General Portland	328	9.5
Gulf Coast	5	11.3

* Sources with SO_2 emissions greater than 250 TPY.
† Based on UTM x,y coordinates of 363.0, 3082.5 km.

Source: ESE, 1984.

sources), emissions from all the major sources were considered.

2. Receptor grid that consisted of 20 receptors located in an area to the southwest of TEC Big Bend plant that aligned the Gardinier sources with those at the Big Bend plant. The receptors were located at intervals of 300 to 500 m. Emissions from the Gardinier and Big Bend sources only were considered for this receptor grid.
3. Receptor grid that consisted of a total of 12 receptors, with 3 receptors located at distances of 0.5, 1.0, and 2.0 km of each of the following sources: TEC Hookers Point/General Portland, TEC Gannon, Chloride Metals, and Gulf Coast Lead. The General Portland and TEC Hookers Point facilities were considered as one major source area because they are located within 400 m of each other. Emissions from all the major sources were considered in the modeling. The receptors were placed along the directions which aligned the Gardinier facility and the major source.

After the screening modeling was completed, the refined modeling consisted of modeling all sources (see Section 5.1.4) using a receptor grid centered on the receptor which had the highest, second-highest 3- and 24-hour concentrations. The receptors were located at intervals of 100 m in a 400-m by 400-m grid, for a total of 25 receptors. To ensure that a valid highest, second-highest concentration was calculated, concentrations were predicted for the refined grid for the periods that produced both the highest and the highest, second-highest concentration from the screening receptor grid.

Refined modeling analysis was not performed for the annual averaging time because the spatial distribution of annual average concentrations is not expected to vary significantly from those produced during the screening analysis.

5.1.6 Background Concentrations

To estimate total air quality concentrations, a background concentration must be added to the modeling results. The background concentration is considered to be the air quality concentration contributed by sources not included in the modeling evaluation.

The derivation of the background concentration for the modeling analysis was presented in Section 4.0. Based on this analysis, the background SO_2 concentration was determined to be 15 ug/m^3. This background level was considered to be representative of all averaging times. This background level was added to model-predicted concentrations to estimate total air quality levels for comparison to AAQS.

5.2 MODEL RESULTS

A summary of the maximum 3-hour, 24-hour, and annual average total SO_2 concentrations predicted for all sources for the screening and refined analyses are presented in Tables 5-5, 5-6, and 5-7, respectively. The total concentrations are determined from the impacts of Gardinier and other modeled sources, added to background concentrations determined from monitoring data. The results are also presented for the maximum concentrations for the three general receptor grids used in the modeling analyses. Based on the results presented in these tables, the maximum SO_2 concentrations due to all sources are predicted to be less than the AAQS for all averaging periods.

As shown in Table 5-5, the total 3-hour average concentrations for all receptor locations considered in the modeling are predicted to be less than the Florida 3-hour AAQS of 1,300 ug/m^3, which is not to be exceeded more than once per year. The maximum predicted 3-hour concentration was 1,005 ug/m^3 and occurred in the receptor grid located to the north of the major sources. This maximum concentration is primarily due to the sources to the north of the Gardinier facility with little contribution from sources at Gardinier.

Table 5-5. Maximum 3-Hour Average SO_2 Concentrations for Comparison to AAQS

Receptor Grid Location	Modeling Analysis	Concentration (ug/m^3)				Receptor Location UTM Coordinates (km)		Period		
			Contribution From							
		Total	Gardinier Sources	Other Modeled Sources	Background	X	Y	Julian Day	Hour Ending	Year
Around Gardinier	Screening	898	456	427	15	363.5	3083.4	158	18	1978
	Refined	901	456	430	15	363.5	3083.4	158	18	1978
South of Big Bend	Screening*	999	0	984	15	360.4	3073.7	158	12	1979
North of Other Major Sources	Screening	937	2	920	15	361.7	3088.79	153	12	1978
	Refined	1005	4	986	15	361.8	3088.99	183	15	1978

Note: Florida 3-hour AAQS is 1,300 ug/m^3, not to be exceeded more than once per year.

* Refined analysis not performed for this receptor grid. See text for details.

Source: ESE, 1984.

Table 5-6. Maximum 24-Hour Average SO_2 Concentrations for Comparison to AAQS

Receptor Grid Location	Modeling Analysis	Concentration (ug/m^3)				Receptor Location UTM Coordinates (km)		Period		
			Contribution From							
		Total	Gardinier Sources	Other Modeled Sources	Background	X	Y	Julian Day	Hour Ending	Year
Around Gardinier	Screening	246	231	0	15	361.9	3083.2	127	24	1979
	Refined	249	234	0	15	362.0	3083.1	127	24	1979
South of Big Bend	Screening*	114	0	99	15	360.4	3073.7	158	24	1979
North of Other Major Sources	Screening*	180	31	134	15	361.38	3090.26	193	24	1975

Note: Florida 24-hour AAQS is 260 ug/m^3, not to be exceeded more than once per year.

* Refined analysis not performed for this receptor grid. See text for details.

Source: ESE, 1984.

Table 5-7. Maximum Annual Average SO_2 Concentrations for Comparison to AAQS

Receptor Grid Location	Concentration (ug/m^3) Total	Total Due To: Gardinier Sources	Total Due To: Other Modeled Sources	Total Due To: Background	Receptor Location UTM Coordinates (km) X	Receptor Location UTM Coordinates (km) Y	Period Year
Around Gardinier	58.4	29.2	14.2	15	362.1	3082.4	1978
South of Big Bend	20.8	3.1	2.7	15	360.4	3073.7	1978
North of Other Major Sources	41.3	2.4	23.9	15	361.38	3090.26	1975

Note: Florida annual AAQS is 60 ug/m^3.

Source: ESE, 1984.

For the refined receptor grids around the Gardinier facility and to the south of the TEC Big Bend facility, the maximum predicted 3-hour average concentrations were 901 and 999 ug/m^3, respectively. The Gardinier sources contributed approximately 51 and 0 percent, respectively, to those maximum concentrations. The maximum concentration of 901 ug/m^3 predicted around the Gardinier facility occurred at the plant property line to the northeast of the Gardinier sources. Because emissions from the Gardinier facility did not contribute to this maximum concentration to the south of the Big Bend facility, modeling results were not refined using a refined receptor grid.

As shown in Table 5-6, the total 24-hour average concentrations for all receptors considered in the modeling are predicted to be less than the Florida 24-hour AAQS of 260 ug/m^3, which is not to be exceeded more than once per year. The maximum predicted 24-hour concentration of 249 ug/m^3 occurred in the receptor grid around the Gardinier facility. This maximum concentration, located along the northwest plant property line, is primarily due to the Gardinier sources, which contribute 94 percent to the total concentration. The estimated background concentration constituted the remainder of the total. None of the other major sources considered in the modeling contributed to the maximum concentration.

The maximum 24-hour average concentrations predicted in the screening analysis for the other receptor grids were less than 200 ug/m^3. Because the Gardinier sources contributed less than 20 percent to the maximum concentrations and maximum concentrations were much lower than that predicted for the receptor grid around the Gardinier facility, modeling results were not refined using a refined grid.

As shown in Table 5-7, the total annual average concentrations for all receptors considered in the modeling are predicted to be less than the Florida annual AAQS of 60 ug/m^3. The maximum predicted annual average concentration was 58.4 ug/m^3 and occurred in the receptor

grid around the Gardinier facility. The Gardinier sources contributed 50 percent to the maximum concentration, which is predicted to occur at the western plant property line.

For the other receptor grids, the maximum predicted annual concentrations were less than 42 ug/m^3. The contribution of the Gardinier sources was less than 15 percent to these concentrations.

6.0 ADDITIONAL IMPACT ANALYSIS

6.1 IMPACTS UPON VEGETATION

Natural vegetation in the vicinity of the Gardinier site consists of cut-over pine flatwoods and mixed forest. Near the coast, mangrove trees and salt-tolerant plants form the vegetative cover. Winter vegetables and pasture grasses are cultivated inland from the facility.

Plant response to atmospheric pollutants is influenced by the concentration during exposure, duration of each exposure, and the frequency of exposures. The usual pattern of pollutant exposure is that of a few episodes of relatively high concentrations for a short duration interspersed with long periods of extremely low concentrations. Effects on most plants will be from the short-term higher doses (a dose is the product of the concentration of the pollutant and the duration of exposure).

The total maximum (highest, second-highest) predicted 3-hour concentration of SO_2 around the Gardinier facility is 901 ug/m^3; this concentration is most likely to occur within 1 km northeast of the emission source. Concentrations will diminish appreciably with distance beyond the location of the maximum concentration. Higher 3-hour concentrations are predicted to the south of Big Bend and north of the other major sources, but the contributions of Gardinier sources to these maximum concentrations, which are below the AAQS, are minimal.

The total maximum predicted 24-hour average SO_2 concentration is 249 ug/m^3, and is predicted to occur northwest of the Gardinier sources in Hillsborough Bay. The total maximum predicted annual SO_2 concentration, including the background concentration level, is 58.4 ug/m^3. It is noted that these predicted levels of impact are much higher than actual measured concentrations at monitors located within 10 km of Gardinier.

Little information is available on the effects of airborne pollutants on species native to Florida. Woltz and Howe (1981) showed that exposure to 1,300 ug/m^3 SO_2 for 8 hours caused no visible injury

to bald cypress (Taxodium distichum), slash pine (Pinus elliottii), live oak (Quercus virginiana), or red mangrove (Rhizophora mangle).

The threshold SO_2 doses known to adversely affect the growth of some common vegetables and grasses are shown in Table 6-1. Most of these doses are higher than SO_2 doses predicted to result from the proposed facility, particularly since agricultural areas and large areas of natural vegetation are some distance from the areas where maximum concentrations will occur.

6.2 IMPACTS UPON SOILS

Soils in the vicinity of the Gardinier site consist primarily of tidal lands and somewhat poorly drained sands with organic pans. The tidal lands occur along the coast between the tidal swamps and the flatwoods. It consists of mucky fine sand to dark-gray fine sand overlying gray fine sand, mixed with broken and whole shells. These soils will not be affected by SO_2 concentrations resulting from facility emissions, because both the underlying substrate and the sea spray from the nearby bay are neutral to alkaline and would neutralize any acidifying effects of SO_2 deposition.

The poorly drained sands are already strongly acidic. Normal liming practices currently used on soils in the vicinity of Gardinier by agricultural interests will effectively mitigate the small effects of any increased SO_2 deposition resulting from increased SO_2 emissions from the proposed expansion.

6.3 IMPACTS UPON VISIBILITY

The existing No. 7 and No. 8 H_2SO_4 plants must currently meet an opacity limitation of 10 percent. This opacity limit must also be met after the plants are expanded to greater capacity. This opacity level produces essentially no visible emissions and, therefore, no increase in the visible plume from the existing plants due to the expansion is expected.

Table 6-1. Lowest Doses of SO_2 Reported to Affect Growth of Some Grasses and Vegetables

Species	Lowest SO_2 Dose Known to Affect Species (ug/m^3)	Reference
Rye grass	367, for 131 days reduced growth	Ayazloo and Bell, 1981
Orchard grass	37 to 62, for 72 days reduced growth	Crittenden and Read, 1979
Oats	1,048, for 3 hours four times during life cycle reduced growth	Heck and Dunning, 1978
Sweet corn	812, for 7 days causes chlorosis, but no yield effects	Mandl et al., 1975
Tomato	1,258, for 5 hours on each of 57 days reduced growth	Kohut et al., 1982
Radish	262, for 3 hours reduced growth	Reinert et al., 1982
Cucumber	52, for 672 hours reduced growth	Meistrik, 1980

Source: ESE, 1984.

Since a PSD Class I area is located less than 100 km from the Gardinier site (85 km), a visibility impact assessment of the Class I area is required. A Level I visibility screening analysis was conducted following the procedures outlined in "Workbook for Estimating Visibility Impairment" (EPA, 1980). The procedure calculates three visibility parameters: plume contrast against the sky (C_1), plume contrast against terrain (C_2), and change in sky/terrain contrast (C_3). If the absolute values of each of these parameters are less than 0.1, then it is highly unlikely that the emissions from the source would cause visibility impairment in the Class I area.

Parameter C_1 is dependent upon NO_x emissions; since no NO_x emissions have been calculated for the proposed Gardinier H_2SO_4 expansion, this parameter was not evaluated further. Parameter C_2 is dependent upon both particulate and NO_x emissions, where particulate emissions would include H_2SO_4 mist. Parameter C_3 is dependent upon particulate and SO_2 emissions. Particulate (H_2SO_4 mist) and SO_2 emissions used for the calculations were based upon the total allowable emissions from the No. 7 and No. 8 H_2SO_4 plants (not just the increase in allowables due to the proposed expansion). Following the Workbook procedure, the value of C_2 was calculated to be 6×10^{-5}, and C_3 was calculated to be 0.005.

Since the absolute values of C_2 and C_3 are below the threshold criteria of 0.10, no visibility impacts are expected upon the Class I area due to emissions from the proposed expansion.

6.4 ADDITIONAL GROWTH

Only the existing No. 7 and No. 8 H_2SO_4 plants are being expanded at the Gardinier facility. Total H_2SO_4 production capacity will increase by 880 tons per day, representing a 15-percent increase. The remainder of the Gardinier plant is already capable of utilizing this increased H_2SO_4 capacity. This small increase in production capacity will have a commensurately small impact on jobs, payroll, and taxes in the area.

Significant new associated facilities will not be required. As a result, no significant growth-related impacts are expected due to the proposed expansion.

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No. 7 Sulfuric Acid Plant Emission Tests

Date	Average Production Rate (tons/hr)	Sulfur Dioxide (lb/hr) Avg.	Sulfur Dioxide (lb/hr) Max.	Sulfur Dioxide (lb/ton) Avg.	Sulfur Dioxide (lb/ton) Max.	H_2SO_4 Mist (lb/hr) Avg.	H_2SO_4 Mist (lb/hr) Max.	H_2SO_4 Mist (lb/ton) Avg.	H_2SO_4 Mist (lb/ton) Max.
08/15/77	57.5	48	56	0.83	0.98	1.9	2.1	0.032	0.037
03/30/78	47.5	106	109	2.23	2.29	1.5	2.0	0.032	0.042
10/31/78	46.0	43	56	0.93	1.19	3.0	4.6	0.065	0.099
05/18/79	44.8	19	20	0.43	0.44	4.3	4.4	0.095	0.097
01/21/80	49.6	32	35	0.64	0.70	1.2	1.8	0.025	0.036
09/11/80	41.7	31	32	0.75	0.77	1.9	2.0	0.045	0.049
05/20/81	42.7	41	45	0.95	1.05	5.4	8.9	0.130	0.210
05/19/82	88.8	235	250	2.65	2.82	3.0	3.2	0.030	0.040
01/13/83	81.5	214	243	2.63	2.97	3.7	4.5	0.040	0.050
Maximums			250		2.97		8.9		0.210

Note: Rated capacity: Prior to 1982--1,350 TPD (57.5 TPH).
Begin 1982--1,750 TPD (72.9 TPH).

Source: Gardinier, Inc., 1984.

No. 7 Sulfuric Acid Plant Emission Tests

Date	Average Production Rate (tons/hr)	Sulfur Dioxide (lb/hr) Avg.	Sulfur Dioxide (lb/hr) Max.	Sulfur Dioxide (lb/ton) Avg.	Sulfur Dioxide (lb/ton) Max.	H_2SO_4 Mist (lb/hr) Avg.	H_2SO_4 Mist (lb/hr) Max.	H_2SO_4 Mist (lb/ton) Avg.	H_2SO_4 Mist (lb/ton) Max.
03/02/77	74.0	127	133	1.73	1.81	4.5	5.7	0.061	0.077
12/09/77	53.4	39	41	0.73	0.78	9.3	11.0	0.174	0.207
08/04/78	63.5	86	95	1.36	1.49	6.8	9.4	0.107	0.147
03/07/79	73.8	299	307	4.05	4.16	2.6	2.7	0.035	0.036
10/25/79	65.1	391	404	6.01	6.20	2.7	3.7	0.042	0.057
08/05/80	69.1	231	245	3.35	3.55	4.2	4.5	0.060	0.065
03/03/81	68.2	118	120	1.70	1.80	3.4	6.2	0.050	0.090
01/26/82	69.8	110	111	1.58	1.59	7.0	10.3	0.100	0.150
08/18/82	66.0	93	93	1.40	1.41	2.2	2.4	0.040	0.040
Maximums			404		6.20		11.0		0.207

Note: Rated capacity = 1,770 TPD (73.75 TPH).

Source: Gardinier, Inc., 1984.

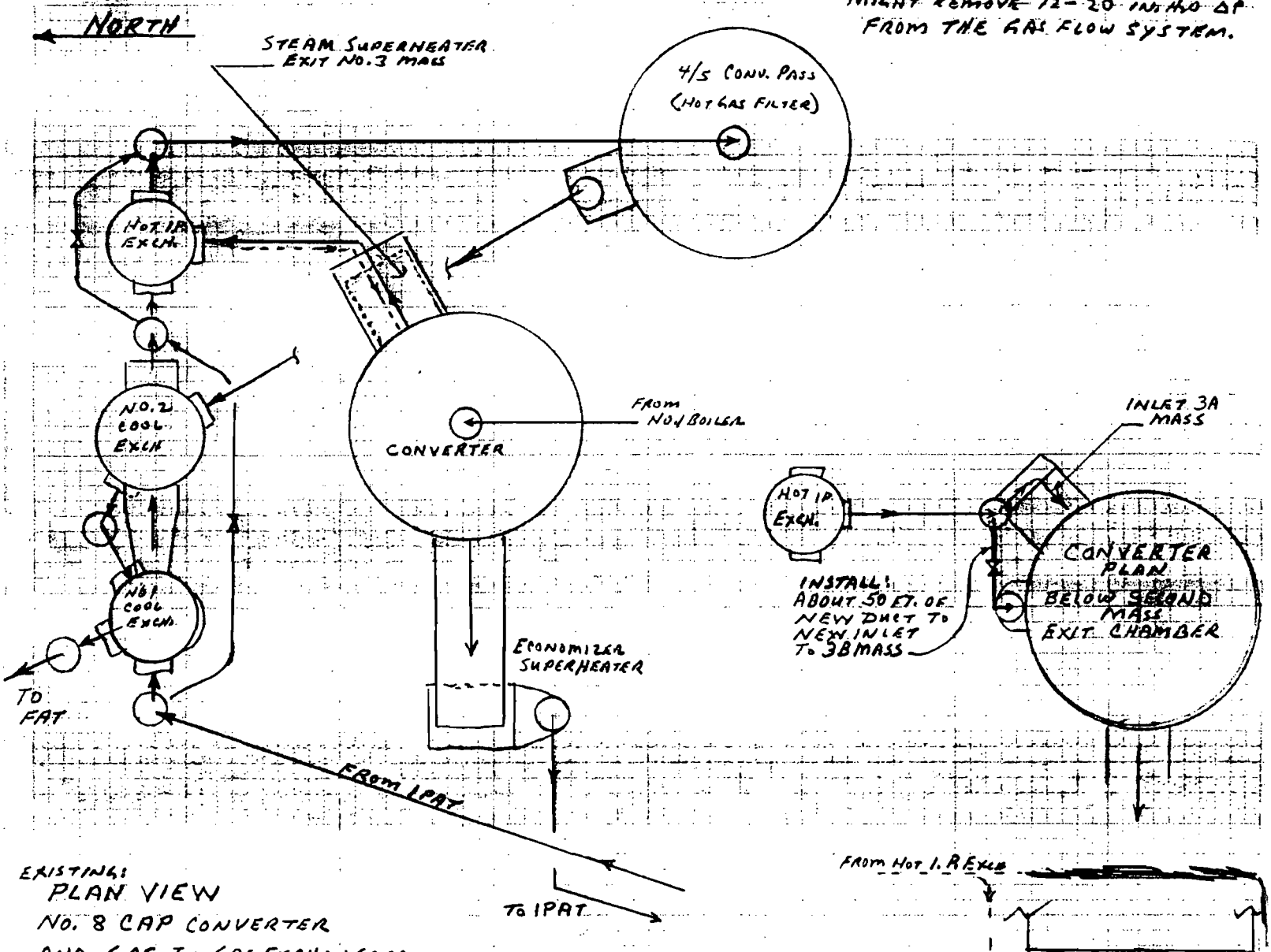
No. 7 Sulfuric Acid Plant Emission Tests

Date	Average Production Rate (tons/hr)	Sulfur Dioxide (lb/hr) Avg.	Sulfur Dioxide (lb/hr) Max.	Sulfur Dioxide (lb/ton) Avg.	Sulfur Dioxide (lb/ton) Max.	H_2SO_4 Mist (lb/hr) Avg.	H_2SO_4 Mist (lb/hr) Max.	H_2SO_4 Mist (lb/ton) Avg.	H_2SO_4 Mist (lb/ton) Max.
12/20/76	118.2	256	272	2.16	2.31	6.0	6.9	0.050	0.060
11/23/77	111.1	216	217	1.94	1.97	7.9	8.3	0.071	0.074
05/12/78	107.5	192	196	1.78	1.82	14.7	16.4	0.136	0.152
03/22/79	112.0	214	222	1.91	1.98	3.5	3.9	0.031	0.035
08/30/79	103.0	204	207	1.98	2.01	3.5	3.7	0.034	0.035
05/29/80	94.0	192	198	2.05	2.12	4.5	5.2	0.048	0.055
02/26/81	106.8	174	204	1.60	1.90	6.6	7.4	0.060	0.070
11/12/81	103.5	202	211	1.95	2.04	4.4	4.5	0.040	0.040
07/14/82	89.0	154	156	1.73	1.75	4.3	4.5	0.048	0.050
01/18/83	108.8	234	239	2.15	2.19	4.6	4.9	0.040	0.050
Maximums			272		2.31		16.4		0.152

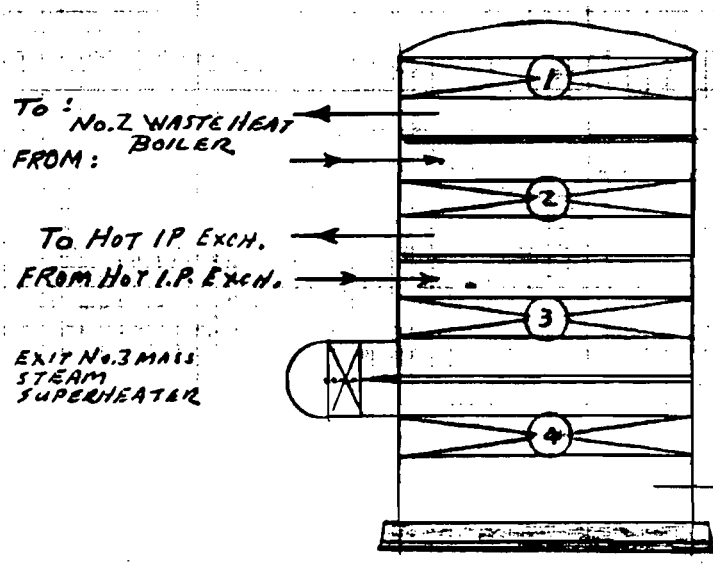
Note: Rated capacity = 2,600 TPD (108.3 TPH).

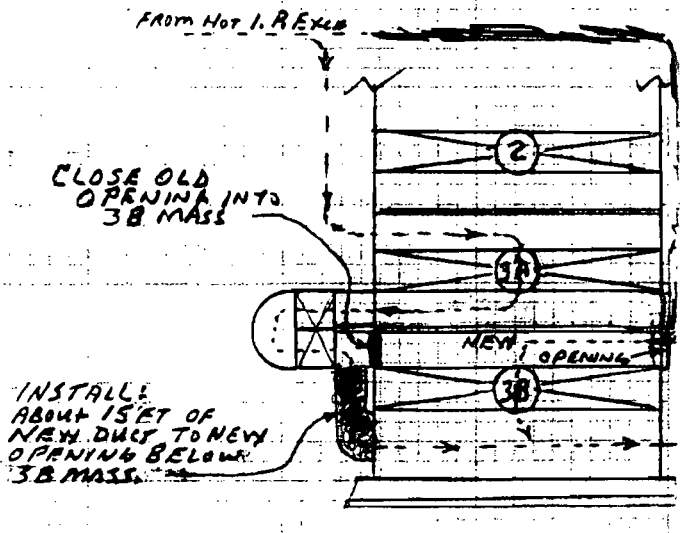
Source: Gardinier, Inc., 1984.

SKETCH OF NO. 8 CAP CONVERTER SHOWING EXISTING LAY-OUT AND PROPOSED GAS DUCT CHANGES THAT MIGHT REMOVE 12–20 INS H₂O ΔP FROM THE GAS FLOW SYSTEM.



EXISTING: PLAN VIEW NO. 8 CAP CONVERTER AND GAS-TO-GAS EXCHANGERS





MIXED GAS FLOW TO THE OLD ECONOMIZER/SUPERHEAT

$300,00

EXISTING: SCHEMATIC ELEVATION OF $SO_2 \rightarrow SO_3$ CONVERTER NO. 8 H_2SO_4 PLANT

OKH 9-21-72

GARDINIER INC.

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

July 10, 1986

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

Subject: No. 8 Sulfuric Acid Plant, Construction Permit No.AC29-089696
Bi-Annual Progress Report

Dear Mr. Fancy:

The "Step-Two Modifications" of our construction permit have not yet been fully implemented. However, work has begun in a portion related to the replacement of the cast iron cooling coils (item F of Step Two). Completion of this item is expected in early 1987.

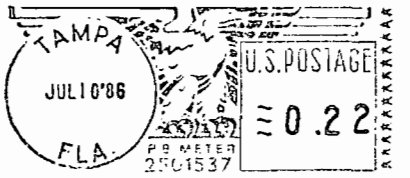
Meanwhile, as stated in our previous progress reports, this plant will run when needed at a production of 2,080 S.T.P.D. or less while maintaining emissions levels below 4 lbs. SO_2/Ton of acid and 0.15 lbs. Mist/Ton.

Sincerely,

E. O. Morris
Manager
Research and Development

cc: HCEPC
Bill Thomas, Tampa

GARDINIER INC.
P. O. BOX 3269 TAMPA, FLORIDA 33601



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

GARDINIER INC.

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

April 18, 1986

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

Subject: No. 8 Sulfuric Acid Plant, Construction Permit No.AC29-089696
Bi-Annual Progress Report

Dear Mr. Fancy:

The "Step-Two Modifications" of our construction permit on this plant have not yet been implemented.

As you may be aware, demand for fertilizer products has been very slack, and as a result, this plant has seen intermittent service in recent months. Therefore we have not yet scheduled a date for the implementation of our "Step-Two Modifications."

Meanwhile, as stated in our previous progress report, this plant will run when needed at a production of 2080 STPD or less while maintaining emissions levels below 4 lb. SO_2/Ton of acid and 0.15 lb. Mist/Ton.

Sincerely,

E. O. Morris
Manager
Research and Development

cc: HCEPC

4/23

~~Bill T. - fyi~~

~~Patty - for file.~~ Please send copy to district

Sent 5/7

PA

Clay

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