main file



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# GARDINIER INC. 1989 MR 20 PH 12: 22

Post Office Box 3269

Tampa, Florida 33601

Telephone 813 - 677 - 9111

TWX 810 - 876 - 0648

Telex - 52666

Cable - Gardinphos

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March 13, 1989

MAR 20 1989

DER - BAQM

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

SUBJECT: AIR CONSTRUCTION PERMIT APPLICATIONS

FOR GARDINIER, INC. MOLTEN SULFUR SYSTEM

HILLSBOROUGH COUNTY, FLORIDA

Dear Mr. Fancy:

Attached are four (4) copies of an application package for an air construction permit for the existing molten sulfur system at the Gardinier phosphate fertilizer complex in Hillsborough County, Florida. The system consists of one 18,000 long ton (tonne), two 10,000 tonne storage tanks and three molten sulfur pits that provide surge capacity between the molten sulfur storage tanks and the three sulfuric acid plants operated by Gardinier, Inc. The system is to be permitted for an annual sulfur throughput rate of 1.2 million tonnes per year.

The sulfur particle emission rate from each of the molten sulfur storage tanks and from each of the sulfur pits will be less than one ton per year. Hence, all of the units are exempt from weight emission limiting standards by Rule 17-2.600(11)(e)2,FAC.

Mr. Clair Fancy March 13, 1989 Page Two

Gardinier would prefer a single air construction permit for the entire molten sulfur facility. For the sake of clarity. however, separate permit applications (DER Form 17-1.202[1]) have been prepared for each of the three molten sulfur storage tanks and a single application has been prepared for the three sulfur pits. Separate application forms have been used to transmit the information as the vent system on the No. 3 storage tank will be modified to convert the tank to a single-vent tank; assuring that the emissions from the tank will be less than one ton per year. Additionally, the vent systems for Tanks 1 and 2, and possibly the storage capacities of these tanks, will be modified. information regarding the three sulfur pits has been entered on one application form, as the pits are similar (but not identical); no modifications are anticipated for any of the three pits, and the sulfur particle emission rate form each pit is less than one per year.

If there are any questions regarding these applications or if additional information should be necessary, please do not hesitate to contact me.

Sincerely,

E.O. Morris

Environmental Manager

cc: Jerry Campbell/EPC/\$365.00

Kowal Sassaman File: P-15

copied P. Raval - 3/29/89

| r | VENDOR NUMBER | INVOICE NUMBER | INVOICE D | ATE  | GROSS AMOUNT     | DISCOUNT | NET AMOUNT |
|---|---------------|----------------|-----------|------|------------------|----------|------------|
|   | 3351          | 7              | 3 15      | · 89 | 20000            | i<br>I   | 20000      |
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|   |               |                |           |      |                  |          |            |
|   |               | ·              |           |      |                  |          |            |
|   | Permit fee/   | Air Construct  | ion perm  | it f | or Gardinier, In | c.       |            |
|   |               | ur System (P-  |           |      |                  | 1.       |            |
|   | <b>,</b>      |                |           |      |                  |          |            |
|   |               | ,              |           | ,    | <br>             | 103      |            |
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|   | . 146,        |                |           |      |                  |          |            |
|   | TOTAL         |                |           |      | 20000            | 1        | 20000      |

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



GARDINIER INC

TAMPATELOPIDA

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64-1278 611. DOLLARS CENTS

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STATE OF FLORIDA DEPARTMENT OF THE ENVIRONMENTAL REGULATION ORDER 4520 OAK FAIR BOULEVARD

GARDINIER, INC.

AUTHORIZED S

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

#57702B369# #O611127BB# O11/07/093#

Ac 29-162375

#200pd 3-20-49 Reept. 117605

STATE OF FLORIDA

### DEPARTMENT OF ENVIRONMENTAL REGULATION



RECEIVED

MAR 20 1989

# DER-BAOM APPLICATION TO XXXXXXX/CONSTRUCT AIR POLLUTION SOURCES

| mibionizon to diamita, obligation min to   | MOTEON DOURSES   |
|--|--|
| SOURCE TYPE: Molten Sulfur System [] New1  | [X] Existing <sup>1</sup>  |
| APPLICATION TYPE: [X] Construction [ ] Operation [ ] M   | odification  |
| COMPANY NAME: Gardinier, Inc.  | COUNTY: Hillsborough   |
| Identify the specific emission point source(s) addressed   | in this application (i.e. Lime   |
| Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas  | Fired)   |
| SOURCE LOCATION: Street U. S. 41   | City Gibsonton   |
| UTM: East (17) 363.0 km  | North 3082.3 km  |
| Latitude 27 ° 51 ' 36 "N   | Longitude <u>82</u> ° <u>23</u> ' <u>29</u> "W   |
| APPLICANT NAME AND TITLE: E. O. Morris, Environmental Ma   | anager   |
| APPLICANT ADDRESS: P. O. Box 3269, Tampa, Florida 3360   |  |
| APPLICANI ADDRESS:   |  |
| SECTION I: STATEMENTS BY APPLICANT A   | AND ENGINEER   |
| A. APPLICANT   |  |
| I am the undersigned owner or authorized representation  | ve* ofGardinier, Inc.  |
| I certify that the statements made in this application permit are true, correct and complete to the best of a lagree to maintain and operate the pollution cont facilities in such a manner as to comply with the postatutes, and all the rules and regulations of the department understand that a permit, if granted by the department upon sale of establishment. | my knowledge and belief. Further, rol source and pollution control provision of Chapter 403, Florida partment and revisions thereof. The artment, will be non-transferable regal transfer of the permitter |
| *Attach letter of authorization Signed:  | O. Alpria  |
| E. O. Morri  | s, Environmental Manager Title (Please Type)   |
|  | Telephone No. (813) 677-9111   |
| B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where rec  |  |

This is to certify that the engineering features of this pollution control project have been descigned/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

DER Form 17-1.202(1) Effective October 31, 1982

<sup>1</sup> See Florida Administrative Code Rule 17-2.100(57) and (104)

|    | pollution sources.  | Signed  |
|----|---|---|
|    | 30,00000000   | John B. Koogler, Ph.D., P.E.  |
|    |   | Name (Please Type)  |
|    |   | Koogler & Associates, Environmental Services  |
|    |   | Company Name (Please Type)  |
|    |   | 4014 N.W. 13th Street, Gainesville, Florida 32609   |
|    | 13035   | Mailing Address (Please Type)   |
| lo | rida Registration No. 12925   | Date: 7/9/89 Telephone No. (904) 377-5822   |
|    | SECTION   | II: GENERAL PROJECT INFORMATION   |
|    | necessary.  | ult in full compliance. Attach additional sheet if  |
|    | See individual information  | packages.   |
| •  |   | packages.  in this application (Construction Permit Application Only)   |
|    |   | in this application (Construction Permit Application Only)  |
|    | Schedule of project covered  Start of Construction Augus  Costs of pollution control s  for individual components/un  | in this application (Construction Permit Application Only)  |
|    | Schedule of project covered  Start of Construction Augus  Costs of pollution control s for individual components/un  Information on actual costs permit.)   | in this application (Construction Permit Application Only)  1989  |
|    | Schedule of project covered  Start of Construction Augus  Costs of pollution control s for individual components/un  Information on actual costs permit.)   | in this application (Construction Permit Application Only)  1989  |
|    | Schedule of project covered  Start of Construction Augus  Costs of pollution control s for individual components/un  Information on actual costs permit.)  Tank ven†s will be modified                                | in this application (Construction Permit Application Only)  1989  |
|    | Schedule of project covered  Start of Construction Augus  Costs of pollution control s for individual components/un  Information on actual costs permit.)  Tank ven†s will be modified                                | in this application (Construction Permit Application Only)  1989  |
|    | Schedule of project covered  Start of Construction Augus  Costs of pollution control s for individual components/un Information on actual costs permit.)  Tank vents will be modified  No modifications are required. | in this application (Construction Permit Application Only) of 1989 Completion of Construction February 1992  ystem(s): (Note: Show breakdown of estimated costs only its of the project serving pollution control purposes. shall be furnished with the application for operation but no air pollution control equipment will be required. red for sulfur pits. |
|    | Schedule of project covered  Start of Construction Augus  Costs of pollution control s for individual components/un Information on actual costs permit.)  Tank vents will be modified  No modifications are required. | in this application (Construction Permit Application Only)  1989  |

TANK NO. 1

# STATE OF FLORIDA

# DEPARTMENT OF ENVIRONMENTAL REGULATION



### INFORMATION FOR TANK NO. 1

| SOURCE TYPE:Molten Sulfur Storage Tank [] New1 [X] Exi                                  | sting <sup>l</sup>                       |  |  |  |  |
|---|--|--|--|--|--|
| APPLICATION TYPE: $[\chi]$ Construction $[\ ]$ Operation $[\ ]$ Modification            | tion                                     |  |  |  |  |
| COMPANY NAME: Gardinier, Inc.   | COUNTY: Hillsborough                     |  |  |  |  |
| Identify the specific emission point source(s) addressed in this application (i.e. Lime |  |  |  |  |  |
| Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired)                        | Tank No. 1                               |  |  |  |  |
| SOURCE LOCATION: Street U. S. 41  | City Gibsonton                           |  |  |  |  |
| UTM: East (17) 363.0 km North   | 3082.3 km                                |  |  |  |  |
| Latitude 27° 51' 36"N Longitu   | ide <u>82</u> ° <u>23</u> ' <u>29</u> "W |  |  |  |  |
| APPLICANT NAME AND TITLE: E. O. Morris, Environmental Manager                           |  |  |  |  |  |
| APPLICANT ADDRESS: P. O. Box 3269, Tampa, Florida 33601                                 |  |  |  |  |  |

#### SECTION II: GENERAL PROJECT INFORMATION

| whether<br>necessar                                     | у.  |
|---|---|
| See pag   | e 2a of 12.   |
|   |   |
|   |   |
|   |   |
|   |   |
| Schedule  | of project covered in this application (Construction Permit Application On)   |
| Start of  | Construction August 1989 Completion of Construction February 1992   |
| Costs of  | pollution control system(s): (Note: Show breakdown of estimated costs only  |
| for indi<br>Informat<br>permit.)                        | vidual components/units of the project serving pollution control purposes. ion on actual costs shall be furnished with the application for operation  |
| for indi<br>Informat<br>permit.)                        | vidual components/units of the project serving pollution control purposes.  |
| for indi<br>Informat<br>permit.)                        | vidual components/units of the project serving pollution control purposes. ion on actual costs shall be furnished with the application for operation  |
| for indi<br>Informat<br>permit.)                        | vidual components/units of the project serving pollution control purposes. ion on actual costs shall be furnished with the application for operation  |
| for indi<br>Informat<br>permit.)                        | vidual components/units of the project serving pollution control purposes. ion on actual costs shall be furnished with the application for operation its will be modified but no air pollution control equipment will be requir   |
| for indi Informat permit.) Tank ven                     | vidual components/units of the project serving pollution control purposes. ion on actual costs shall be furnished with the application for operation its will be modified but no air pollution control equipment will be required.  any previous DER permits, orders and notices associated with the emission |
| for indi Informat permit.) Tank ver  Indicate point, in | vidual components/units of the project serving pollution control purposes. ion on actual costs shall be furnished with the application for operation its will be modified but no air pollution control equipment will be requir   |
| for indi Informat permit.) Tank ven                     | vidual components/units of the project serving pollution control purposes. ion on actual costs shall be furnished with the application for operation its will be modified but no air pollution control equipment will be required.  any previous DER permits, orders and notices associated with the emission |

#### SECTION II: A.

Permitting of existing molten sulfur storage Tank No. 1 to comply with Rules 17-2 and 17-4, FAC. The tank presently has a capacity of 10,000 long tons (tonnes) of sulfur. The tank will possibly be expanded in size to 18,000 tonne capacity within 24 months of the receipt of a permit. In the expanded configuration, the tank will have the same vent arrangement as Tank No. 3; a single center roof vent.

Drawing SK-1 shows the present configuration of Tank No. 1 and Drawing SK-3 shows the dimensions of an 18,000 tonne tank (Tank No. 3). Drawing SK-4 shows the detail of seals for roof rim vents regardless of the ultimate capacity of the tank.

As a single vent tank, Tank No. 1 will have particulate matter emissions of less than one ton per year and the tank will operate in compliance with all applicable rules in Chapter 17-2, FAC.

|  | _     |
|--|-------|
| f this is a new source or major modification, answer the following quest Yes or No)  Existing minor source                           | ions. |
| . Is this source in a non-attainment area for a particular pollutant?  | NA    |
| a. If yes, has "offset" been applied?  |       |
| b. If yes, has "Lowest Achievable Emission Rate" been applied?   |       |
| c. If yes, list non-attainment pollutants.   |       |
| . Does best available control technology (BACT) apply to this source? If yes, see Section VI.  | NA    |
| . Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections VI and VII. | NA    |
| . Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source?  | NA    |
| . Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source?                                       | NA    |
| o "Reasonably Available Control Technology" (RACT) requirements apply<br>o this source?  | NO    |
| a. If yes, for what pollutants?  |       |

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

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

| Description    |        | Contam<br>Type | inants ##   | Utilization<br>Rate - lbs/hr | . Relate to Flow Diagram |
|----------------|--------|----------------|-------------|------------------------------|--------------------------|
| <u> </u>       |        |                |             |                              |                          |
| Molten Sulfur  |        | None           | _           | 2,200,000*                   | 1 A                      |
| ·              |        | •              |             |                              |                          |
|                |        |                |             |                              |                          |
| _              |        | <del></del>    |             |                              | -                        |
| *Transfer rate | of mol | lten sulfur    | from vessel | to tank.                     |                          |

- B. Process Rate, if applicable: (See Section V, Item 1)
  - 1. Total Process Input Rate (1bs/hr): NA Molten sulfur storage
  - 2. Product Weight (1bs/hr):NA Molten sulfur storage
- C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

| Name of      | Emission          |                | Allowed <sup>2</sup> Emission Allowable <sup>3</sup> Rate per Emission |              | Potential <sup>4</sup><br>Emission |      | Relate<br>to Flow |  |
|--------------|-------------------|----------------|--|--------------|------------------------------------|------|-------------------|--|
| Contaminant  | Maximum<br>lbs/hr | Actual<br>T/yr | Rule<br>17-2   | lbs/hr       | lbs/yr                             | T/yr | Diagram           |  |
| Part. Matter |                   |                |  |              |                                    |      |                   |  |
| (1)          | 1.44              | 0.29           | <u>-</u>   | -            | 1.44                               | 0.29 | 1C                |  |
| (2)          | 0.08              | 0.31           | -  | 1            | 0.08                               | 0.31 | 1C                |  |
| Total        | _                 | 0.60           | 17-2.600(11)   | (e)2 <1.0 tp | ,<br>-                             | 0.60 | 1C                |  |
|              |                   |                |  |              |                                    |      |                   |  |

<sup>1(1)</sup> Sulfur pumped to tank at 1000 tonnes/hr; (2) Tank sitting idle or with sulfur being withdraws Section V, Item 2.

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

<sup>&</sup>lt;sup>3</sup>Calculated from operating rate and applicable standard.

 $<sup>^{4}</sup>$ Emission, if source operated without control (See Section V, Item 3).

D. Control Devices: (See Section V, Item 4) Basis for Range of Particles Efficiency Contaminant Efficiency Name and Type Size Collected (Model & Serial No.) (in microns) (Section V (If applicable) Item 5) NONE E. Fuels Consumption\* Maximum Heat Input Type (Be Specific) avg/hr max./hr (MMBTU/hr) NONE \*Units: Natural Gas--MMCF/hr; Fuel Cils--gallons/hr; Coal, wood, refuse, other--lbs/hr. Fuel Analysis: Percent Sulfur:\_\_\_\_\_ Percent Ash:\_\_\_\_\_ Density: \_\_\_\_\_ lbs/gal Typical Percent Nitrogen:\_\_\_\_ Heat Capacity: \_\_\_\_\_\_\_ BTU/1b \_\_\_\_\_\_ BTU/gal Other Fuel Contaminants (which may cause air pollution):\_\_\_\_\_ F. If applicable, indicate the percent of fuel used for space heating. Annual Average NA Maximum G. Indicate liquid or solid wastes generated and method of disposal. NONE

Air flow with no tank activity or during sulfur withdrawal during tank filling. Emission Stack Geometry and Flow Characteristics (Provide data for each stack): 32 ft @ 18000 tonne capacity Stack Height: 24 ft @ 10000 tonne capacityft. Stack Diameter: 0.83 ft. Gas Flow Rate: 40/445 ACFM 30/330 DSCFM Gas Exit Temperature: 240 °F. Water Vapor Content: 2 % Velocity: \_\_\_\_1.2/13.6 FPS SECTION IV: INCINERATOR INFORMATION (NOT APPLICABLE) Type I | Type II. Type of Type O Type III Type IV Type V Type VI (Plastics) (Rubbish) (Refuse) (Garbage) (Patholog- (Liq.& Gas (Solid By-prod.) Waste ical) By-prod.) Actual lb/hr Incinerated Uncontrolled (lbs/hr) Description of Waste \_\_\_\_\_ Total Weight Incinerated (1bs/hr) \_\_\_\_\_\_ Design Capacity (1bs/hr)\_\_\_\_ Approximate Number of Hours of Operation per day \_\_\_\_\_ day/wk \_\_\_\_\_ wks/yr.\_\_\_\_ Manufacturer\_\_\_\_ Date Constructed Model No. Heat Release Fuel\_ Volume Temperature (ft)3 . BTU/hr (BTU/hr) Type (°F) Primary Chamber Secondary Chamber Stack Height: \_\_\_\_\_ ft. Stack Diamter: \_\_\_\_ Stack Temp. \_\_\_\_ Gas Flow Rate: \_\_\_\_\_\_ACFM \_\_\_\_\_\_ DSCFM\* Velocity: \_\_\_\_\_\_FPS \*If 50 or more tons per day design capacity, aubmit 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

DER Form 17-1.202(1) Effective November 30, 1982 [ ] Other (specify)\_\_\_\_\_

|   |      | <br> |   |    | <br>   |
|---|------|------|---|----|--|
|   | <br> | <br> |   |    | <br>   |
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|   |      | <br> |   |    |  |
| _ |      |      |   |    |  |
|   |      |      | · | ·  | l of any effluent other than that emitted from the stack (scrubber |

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

# SECTION V: SUPPLEMENTAL REQUIREMENTS (SEE PAGE 7a - c of 12)

Please provide the following supplements where required for this application.

- 1. Yotal process input rate and product weight -- show derivation [Rule 17-2.100(127)]
- 2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.
- 3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).
- 4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section aketch, design pressure drop, etc.)
- 5. With construction permit application, attach derivation of control device(a) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).
- 6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.
- 7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).
- 8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

DER Form 17-1.202(1) Effective November 30, 1982

#### SECTION V: SUPPLEMENTAL INFORMATION

#### Process input/production rates

#### Input Rate

Molten sulfur input rate to tank

- = 1000 tonne/hr x 2200 lb/ton
- = 2,200,000 1b/hr

Annual throughput @ 1.2 MM tonnes for the entire facility.

Assume annual throughput will be equally distributed between the three tanks.

- = 1,2000,000/3
- = 400,000 tonne/yr

Time required to transfer sulfur to tank

- = 400,000 tonne/yr x 1/1000 tonne/hr
- = 400 hr/yr

#### Sulfur Withdrawal

Maximum sulfur withdrawal rate is approximately 300 tonnes/hr. The sulfur is pumped to one of three covered sumps that serve the sulfuric acid plants.

#### 2/3. Controlled and Uncontrolled Emissions

Tank No. 1 will possibly be expanded from 10,000 tonne capacity to 18,000 tonne capacity within 24 months of receipt of permit. Hence, this permit application addresses the expanded tank. If the tank is not expanded, the configuration will be as shown in Drawing SK-1. The roof vents, except for the single center vent, will be sealed. Seal details are shown in Drawing SK-4.

If the tank capacity is increased to 18,000 tonnes, the tank will be as shown in Drawing SK-3 (Tank No. 3); with the roof rim vents sealed as shown in Drawing SK-4. Emissions from the tank will be essentially the same regardless of capacity.

Emission measurements made on a single vent molten sulfur storage tank (Pennzoil) demonstrated that the ventilation rate of the tank (wind induced), while the tank is sitting idle (or while sulfur is being withdrawn) is approximately 30 dscfm. These measurements also indicated the sulfur particle concentration in the air vented from the

tank is in the range of 0.46 grains per dscf.

Measurements made on the Gardinier molten sulfur storage tanks in November 1988 (multiple vents on the tanks) showed a sulfur particle concentration in the vented gas of 0.51 grains per dscf when molten sulfur was being pumped into the tanks at the rate of 1000 tonnes per hour and 0.29 grains per dscf when the tanks were sitting idle.

For calculating emissions from the tank, the following conditions have been established:

#### Tank Filling

Ventilation Rate = 330 dscfm (Ventilation due to inflow of 1000

tonnes/hr molten sulfur plus wind induced

ventilation)

Sulfur Particle

Concentration = 0.51 grains/dscf

Time = 400 hr/yr

Tank Idle

Ventilation Rate = 30 dscfm (from Pennzoil report)

Sulfur Particle

Concentration = 0.29 grains/dscf

Time = 8760-400

= 8360 hr/yr

Emissions were estimated for the single vent only as rim vents will be sealed as shown in Drawing SK-4.

#### Tank Filling

Emissions = 330 cfm x 60 min/hr

x 0.51 gr/cf x 1/7000 gr/lb

= 1.44 lb/hr

x 400 hr/yr x 1/2000

= 0.29 tpy

#### Tank Idle

Emissions =  $30 \operatorname{dscfm} \times 60 \operatorname{min/hr} \times 0.29 \operatorname{gr/cf}$ 

x 1/7000 0.075 lb/hr

x 8360 hr/yr x 1/2000

= 0.31 tpy

### Total Emissions

Hourly

0.075 to 1.44 lb/hr

Annual

0.60 tpy

4. Control System
See Drawing SK-4 for vent seal design

- Control Efficiency Not Applicable
- 6. System Flow Diagram Attachment 1
- 7. Location Map Attachment 2
- 8. Site Map
  Attachment 3
- 9. Permit Fee \$200 for the molten sulfur system
- 10. Not Applicable

| 9. | The appropriate | application fee in accordance  | with Rule 17-4.05. | The check should be |
|----|-----------------|--------------------------------|--------------------|---------------------|
|    | made payable to | the Department of Environmenta | l 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

| Α.       | (NOT APPLICAL Are standards of performance for new state applicable to the source? | BLE) ionary sources pursuant to 40 C.F.R. Part 60 |
|----------|--|---|
|          | [ ] Yes [ ] No   |   |
|          | Contaminant  | Rate or Concentration                             |
| <u></u>  |  |   |
|          |  |   |
| <u>.</u> |  |   |
|          |  |   |
| В.       | Has EPA declared the best available contryes, attach copy)                         | col technology for this class of sources (I       |
|          | [ ] Yea [ ] No   |   |
|          | Contaminant  | Rate or Concentration                             |
|          |  |   |
|          |  |   |
|          |  |   |
|          |  |   |
| с.       | What emission levels do you propose as bes   | t available control technology?                   |
|          | Contaminant  | Rate or Concentration                             |
|          |  |   |
|          |  |   |
|          |  |   |
|          |  |   |

Control Device/System:

2. Operating Principles:

3. Efficiency:\*

4. Capital Costs:

\*Explain method of determining

DER Form 17-1.202(1) Effective November 30, 1982

|                                    | 5.           | Useful Life:   |             | 6.   | Operating Costs:  |         |
|------------------------------------|--------------|--|-------------|------|---|---------|
|                                    | 7.           | Energy:  |             | 8.   | Maintenance Cost:   |         |
|                                    | 9.           | Emissions:   |             |      | •   |         |
|                                    |              | Contaminant  |             |      | Rate or Concentration                                       |         |
|                                    |              |  |             | _    |   |         |
|                                    |              |  |             |      |   |         |
|                                    | 10.          | Stack Parameters   |             | -    |   |         |
|                                    | a.           | Height:  | ft.         | ь.   | Diameter:   | ft.     |
|                                    | c.           | Flow Rate:   | ACFM        | d.   | Temperature:  | ۹F.     |
|                                    | ٠.           | Velocity:  | FPS         |      |   |         |
| E.                                 |              | cribe the control and treatment additional pages if necessary).  Control Device: | techn       | olog | y available (As many types as appl<br>Operating Principles: | icable, |
|                                    | c.           | Efficiency: 1  |             | d.   | Capital Cost:   |         |
|                                    | e.           | Useful Life:   |             | f.   | Operating Cost:   |         |
|                                    | g.           | Energy: <sup>2</sup>   |             | h.   | Maintenance Cost:   |         |
|                                    | i.           | Availability of construction was   | terial      | s an | d process chemicals:  |         |
|                                    | j.           | Applicability to manufacturing p   | 00068       | ses: |   |         |
|                                    | k.           | Ability to construct with contr<br>within proposed levels:                       | ol de       | vice | , install in available space, and o                         | perate  |
|                                    | 2.           |  |             |      |   |         |
|                                    | a.           | Control Device:  |             | ь.   | Operating Principles:                                       |         |
|                                    | c.           | Efficiency: 1  | :           | d. , | Capital Cost:   |         |
|                                    | е.           | Useful Life:   |             | f.   | Operating Cost:   |         |
|                                    | g.           | Energy: <sup>2</sup>   |             | h.   | Maintenance Cost:   |         |
|                                    | i.           | Availability of construction mat   | erial       | s an | d process chemicals:  |         |
| 1 <sub>Ex</sub><br>2 <sub>En</sub> | plai<br>ergy | n method of determining efficienc<br>to be reported in units of elect            | y.<br>rical | pow  | er – KWH design rate.                                       |         |

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j. Applicability to manufacturing processes: Ability to construct with control device, install in available space, and operate within proposed levels: 3. Control Device: b. Operating Principles: **A**. Efficiency: 1 d. Capital Cost: c. Useful Life: f. Operating Cost: Energy: 2 h. Maintenance Cost: g. Availability of construction materials and process chemicals: Applicability to manufacturing processes: j. Ability to construct with control device, install in available space, and operate k. within proposed levels: 4. Control Device: b. Operating Principles: а. Efficiency: 1 d. Capital Costs: Useful Life: f. Operating Cost: Energy: 2 h. Maintenance Cost: Availability of construction materials and process chemicals: Applicability to manufacturing processes: Ability to construct with control device, install in available space, and operate within proposed levels: Describe the control technology selected: 2. Efficiency: 1 1. Control Device: 3. Capital Cost: 4. Useful Life: 6. Energy: 2 5. Operating Cost: 8. Manufacturer: Maintenance Cost: 9. Other locations where employed on similar processes: a. (1) Company: (2) Mailing Address: (4) State: (3) City: Lexplain method of determining efficiency.  $^{2}$ Energy to be reported in units of electrical power – KWH design rate. DER Form 17-1.202(1)

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| (     | 5) Environmental Manager:                                     |                            |                |                     |             |              |
|-------|---|----------------------------|----------------|---------------------|-------------|--------------|
| (     | 6) Telephone No.:   |                            |                |                     |             |              |
| (     | 7) Emissions: 1   |                            |                |                     |             |              |
|       | Contaminant   |                            |                | Rate or             | Concentrati | on           |
|       |   |                            |                |                     |             |              |
|       |   |                            |                |                     |             |              |
| (     | 8) Process Rate: 1  |                            |                |                     |             |              |
| b     | . (1) Company:  |                            |                |                     |             |              |
| (     | 2) Mailing Address:   |                            |                |                     |             |              |
| (     | 3) City:  |                            | (4) State:     |                     |             |              |
| (     | 5) Environmental Manager:                                     |                            |                |                     |             |              |
| (     | 6) Telephane Na.:   |                            |                |                     |             |              |
| (     | 7) Emissions: 1   |                            |                |                     |             |              |
|       | Contaminant   |                            |                | Rate or (           | Concentrati | on           |
|       |   |                            |                |                     |             |              |
| (     | 8) Process Rate: 1  |                            |                | •                   |             |              |
| 1     | O. Reason for selection and                                   | description                | of systems:    |                     |             |              |
|       | icant must provide this info<br>lable, applicant must state t |                            |                | Should              | this infor  | mation not b |
| A. C  | SECTION VII - P<br>(NOT                                       | REVENTION OF<br>APPLICABLE |                | T DETERIOR          | RATION      |              |
| 1     | no. sites   | TSP:                       | <u> </u>       | _ SO <sup>2</sup> * | W:          | ind spd/dir  |
| Р     | eriod of Monitoring   | month da                   | /<br>y -year t | o /                 | day year    |              |
| 0     | ther data recorded  |                            |                |                     |             |              |
|       | ttach all data or statistical                                 |                            | •              |                     |             |              |
| *Spec | ify bubbler (8) or continuous                                 | (C).                       |                |                     |             |              |
|       | orm 17-1.202(1)<br>tive November 30, 1982                     | Page 1                     | 1 of 12        |                     |             |              |

|    | 2.   | Instrumenta                                | ation, Fie | ld and   | Labora | tory       |       |               |         |       |           |         |        |              |
|----|------|--|------------|----------|--------|------------|-------|---------------|---------|-------|-----------|---------|--------|--------------|
|    | a.   | Was instru                                 | mentation  | EPA ref  | erence | d or i     | ts eq | uivale        | nt?     | [ ]   | Yes       | [ ] N   | o      |              |
|    | ь.   | Was instrum                                | entation   | calibra  | ted in | accor      | dance | with          | Depa    | rtmer | nt p      | rocedur | es?    |              |
|    |      | [ ] Yes [                                  | ] No [ ]   | Unknow   | n      |            |       |               |         |       |           | •       |        |              |
| В. | Met  | eorological                                | Data Used  | for Ai   | r Qual | ity Mo     | delin | g             |         |       |           |         |        |              |
|    | 1.   | Year(                                      | s) of dat  | a from   | month  | / /<br>day | year  | to <u>mon</u> | /<br>th | day   | /<br>yea: | _<br>r  |        |              |
|    | 2.   | Surface dat                                | a obtaine  | d from   | (locat | ion)       |       |               |         |       |           |         |        | <del> </del> |
|    | 3.   | Upper air (                                | mixing he  | ight) d  | ata ob | tained     | from  | (loca         | tion    | )     |           |         |        |              |
|    | 4.   | Stability w                                | ind rose   | (STAR)   | data o | btaine     | d fro | m (loc        | atio    | n)    |           |         |        |              |
| с. | Comp | puter Models                               | Used       |          |        |            |       |               |         |       |           |         |        |              |
|    | 1.   |  |            |          |        |            |       | Modifi        | ød?     | If y  | es,       | attach  | desci  | ription.     |
|    | 2.   |  |            |          |        |            |       | Modifi        | ed?     | If y  | es,       | attach  | desci  | ription.     |
|    | 3.   |  |            |          |        |            |       | Hodifi        | ød?     | If y  | es,       | attach  | desci  | ription.     |
|    | 4.   |  |            |          |        |            |       |               |         |       |           |         |        |              |
|    |      | ach copies o<br>le output ta               |            | al mode  | l runs | showi      | ng in | put da        | ta,     | recep | tor       | locati  | วกร, ย | nd prin-     |
| D. | Арр  | licants Maxi                               | mum Allow  | able Emi | ission | Data       |       |               |         |       |           |         |        |              |
|    |      | lutant                                     |            | Emi      | ission | Rate       |       |               |         |       |           |         |        |              |
|    | ī    | TSP  |            |          |        |            |       |               | gra     | ma/se | С         |         |        |              |
|    |      | 50 <sup>2</sup>                            |            |          |        |            |       |               | gra     | ms/se | С         |         |        |              |
| ε. | Emis | ssion Data U                               | aed in Moc | ieling   |        |            |       |               |         |       |           |         |        |              |
|    | poin | ach list of<br>nt source (o<br>normal oper | n NEDS po  | int numi |        |            |       |               |         |       |           |         |        |              |

- F. Attach all other information supportive to the PSD review.
- G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.
- 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.

TANK NO. 2

#### STATE OF FLORIDA

# DEPARTMENT OF ENVIRONMENTAL REGULATION



## INFORMATION FOR TANK NO. 2

| SOURCE TYPE: Molten Sulfur Storage Tank [ ] New1  | [ <sup>X</sup> ] Exis | ting <sup>l</sup>          |  |  |  |
|---|-----------------------|----------------------------|--|--|--|
| APPLICATION TYPE: [ $\chi$ ] Construction [] Operation [] Mo                            | odificat              | ion                        |  |  |  |
| COMPANY NAME: Gardinier, Inc.   |                       | COUNTY: Hillsborough       |  |  |  |
| Identify the specific emission point source(s) addressed in this application (i.e. Lime |                       |                            |  |  |  |
| Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) Tank No. 2             |                       |                            |  |  |  |
| SOURCE LOCATION: Street U. S. 41  |                       | City Gibsonton             |  |  |  |
| UTM: East (17) 363.0 km   | North                 | 3082.3 km                  |  |  |  |
| Latitude <u>27° 51' 36</u> "N   | Longitud              | ie <u>82 ° 23 ' 29 </u> "W |  |  |  |
| APPLICANT NAME AND TITLE: E. O. Morris, Environmental Ma                                | nager                 |                            |  |  |  |
| APPLICANT ADDRESS: P. O. Box 3269, Tampa, Florida 3360                                  | 1                     |                            |  |  |  |

#### SECTION II: GENERAL PROJECT INFORMATION

| Α.  | Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary. |
|-----|---|
|     | See page 2a of 12.  |
|     |   |
|     |   |
|     |   |
| в.  | Schedule of project covered in this application (Construction Permit Application Only)  |
|     | Start of Construction August 1989 Completion of Construction February 1992  |
| 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.) |
|     | Tank vents will be modified but no air pollution control equipment will be required.  |
|     |   |
|     |   |
|     |   |
| D.  | Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.   |
|     | None  |
|     |   |
|     |   |
|     |   |

#### SECTION II: A.

Permitting of existing molten sulfur storage Tank No. 2 to comply with Rules 17-2 and 17-4, FAC. The tank presently has a capacity of 10,000 long tons (tonnes) of sulfur but is out of service for repairs and modification. The tank will most likely be expanded in size to 18,000 tonne capacity within 9 months of the receipt of a permit. In the expanded configuration, the tank will have the same vent arrangement as Tank No. 3; a single center roof vent.

Drawing SK-2 shows the present configuration of Tank No. 2 and Drawing SK-3 shows the dimensions of an 18,000 tonne tank (Tank No. 3). Drawing SK-4 shows the detail of seals for roof rim vents regardless of the ultimate capacity of the tank.

As a single vent tank, Tank No. 2 will have particulate matter emissions of less than one ton per year and the tank will operate in compliance with all applicable rules in Chapter 17-2, FAC.

|    | <del></del>  | · · · |
|----|--|-------|
|    |  |       |
|    | this is a new source or major modification, answer the following quest. es or No) Existing minor source                            | ions. |
| ١. | Is this source in a non-attainment area for a particular pollutant?  | NA    |
|    | a. If yes, has "offset" been applied?  |       |
|    | b. If yes, has "Lowest Achievable Emission Rate" been applied?   | ·     |
|    | c. If yes, list non-attainment pollutants.   |       |
| ٠. | Does best available control technology (BACT) apply to this source? If yes, see Section VI.  | NA    |
|    | Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections VI and VII. | NA    |
| ٠. | Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source?  | NA    |
|    | Do "National Emission Standards for Hazardous Air Pollutants"<br>(NESHAP) apply to this acurce?                                    | NA    |
|    | "Reasonably Available Control Technology" (RACT) requirements apply 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:

|                   | Contam        | inants      | Utilization   |                        |  |  |
|-------------------|---------------|-------------|---------------|------------------------|--|--|
| Description       | Туре          | % Wt        | Rate - lbs/hr | Relate to Flow Diagram |  |  |
| Molten Sulfur     | None          |             | 2,200,000*    | 2A                     |  |  |
|                   | ·.            |             |               |                        |  |  |
|                   |               |             |               |                        |  |  |
|                   |               |             |               |                        |  |  |
| *Transfer rate of | molten sulfur | from vessel | to tank.      |                        |  |  |

- B. Process Rate, if applicable: (See Section V, Item 1)
  - 1. Total Process Input Rate (lbs/hr): NA Molten sulfur storage
  - 2. Product Weight (lbs/hr):NA Molten sulfur storage
- C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional aheets as necessary)

| Name of      | Emiss             | ionl           | Allowed <sup>2</sup><br>Emission<br>Rate per | Allowable <sup>3</sup><br>Emission | Potent<br>Emiss |      | Relate<br>to Flow |
|--------------|-------------------|----------------|--|------------------------------------|-----------------|------|-------------------|
| Contaminant  | Maximum<br>lbs/hr | Actual<br>T/yr | Rule<br>17-2                                 | lbs/hr                             | lbs/yr          | T/yr | Disgram           |
| Part. Matter |                   | ,              |  |                                    |                 |      |                   |
| (1)          | 1.44              | 0.29           | -  | -                                  | 1.44            | 0.29 | 2C                |
| (2)          | 0.08              | 0.31           | _  | _                                  | 0.08            | 0.31 | 2C                |
| Total        | -                 | 0.60           | 17-2.600(11)                                 | e)2 <1.0 tp                        | <i>,</i> –      | 0.60 | 2C                |
|              |                   |                |  |                                    |                 |      |                   |

<sup>1(1)</sup> Sulfur pumped to tank at 1000 tonnes/hr; (2) Tank sitting idle or with sulfur being withdraw: See Section V, Item 2.

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

<sup>&</sup>lt;sup>3</sup>Calculated from operating rate and applicable standard.

 $<sup>^4</sup>$ Emission, if source operated without control (See Section V, Item 3).

| Name and Type<br>(Model & Serial No.) | Contaminant      | Efficiency     | Size<br>(in | f Particles<br>Collected<br>microns)<br>plicable) | Basis for<br>Efficiency<br>(Section \<br>Item 5) |
|---------------------------------------|------------------|----------------|-------------|---|--|
| NONE                                  |                  | ·              | •           |   |  |
|                                       |                  |                |             |   |  |
|                                       |                  |                |             | -   |  |
|                                       |                  |                |             |   |  |
|                                       |                  |                |             |   |  |
| . Fuels                               | ,                |                |             |   |  |
| Type (Be Specific)                    |                  | Consumption*   |             | Maximum   | Heat Input                                       |
|                                       | avg/hr           | Ma             | x./hr       |   | BTU/hr)  |
| NONE                                  |                  |                |             |   |  |
|                                       |                  |                |             |   |  |
|                                       | -                |                |             |   |  |
| Jnits: Natural GasMMC                 | F/hr; Fuel Oils- | -gallons/hr; C | oal, wood,  | refuse, othe                                      | rlbs/hr.   |
| uel Analysis:                         |                  |                |             | ÷   |  |
| ercent Sulfur:                        |                  |                |             |   |  |
| ensity:                               | 18               | os/gal Typical | Percent N   | itrogen:  |  |
|                                       | E                |                |             | ·   |  |

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NONE

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

Indicate liquid or solid wastes generated and method of disposal.

Annual Average \_\_\_\_\_NA . Maximum \_\_\_\_\_

|  |   |                          |                          |         |              |       |                 | <u> </u>                    |
|--|---|--------------------------|--------------------------|---------|--------------|-------|-----------------|-----------------------------|
|  | ate: 40/44                                      |                          |                          |         |              |       |                 |                             |
| (ater Vapo   | r Content:                                      | 2                        |                          | *       | Velocity     | :     | 1.2/13.6        | FP                          |
|  |   | SECT                     | ION IV:                  |         |              | RMATI | ON              | <b>T</b>                    |
| Type of Waste  |   |                          |                          |         | ge) (Path    |       |                 | Type VI<br>(Solid By-prod.) |
| Actual<br>lb/hr<br>Inciner-<br>ated  |   |                          |                          |         |              |       |                 |                             |
| Uncon-<br>trolled<br>(lbs/hr)  |   |                          |                          |         |              |       |                 |                             |
|  |   |                          |                          |         |              |       |                 |                             |
|  | n of Waste                                      |                          |                          |         |              |       |                 |                             |
| otal Weigl   | nt Incinera                                     | ted (lbs/h               | r)                       |         | Design       | n Cap | acity (lbs/     | /hr)                        |
| otal Weigl   | nt Incinera                                     | ted (lbs/h               | r)                       |         | Design       | n Cap | acity (lbs/     | /hr)wks/yr                  |
| otal Weight<br>pproximate<br>anufacture  | nt Incinera<br>• Number of                      | ted (lbs/h               | r)                       | per day | Design       | n Cap | acity (lbs/     | wks/yr                      |
| otal Weight<br>pproximate<br>anufacture  | nt Incinera<br>• Number of                      | ted (lbs/h               | r)                       | per day | Design       | n Cap | acity (lbs/     |                             |
| otal Weight<br>pproximate<br>anufacture  | nt Incinera<br>• Number of                      | ted (lbs/h               | r)                       | per day | Design       | day/  | acity (lbs/     | wks/yr                      |
| otal Weight<br>pproximate<br>anufacture  | nt Incinera  Number of  sr                      | ted (lbs/h               | Dperation                | per day | Design       | day/  | acity (lbs/     | wks/yr                      |
| otal Weight<br>pproximate<br>anufacture<br>ate Consti  | nt Incinera  Number of  ructed                  | ted (lbs/h               | Dperation                | per day | Design       | day/  | acity (lbs/     | wks/yr                      |
| otal Weight<br>pproximate<br>anufacture<br>ate Consti<br>Primary Ch<br>Secondary                     | nt Incinera  Number of  ructed                  | Hours of (  Yolume (ft)  | Dperation  Heat Re (BTU/ | Mode    | Design       | n Cap | BTU/hr          | wks/yr                      |
| otal Weight pproximate anufacture ate Consti   | nt Incinera  Number of  ructed  namber  Chamber | Hours of (  Yolume (ft)3 | Heat Re<br>(BTU/         | Mode    | Design       | r Cap | BTU/hr  Stack T | Temperature (°F)            |
| otal Weight pproximate anufacture ate Consti  Primary Ch Secondary tack Height as Flow Re If 50 or m | nt Incinera  Number of  ructed  Chamber  nt:    | Volume (ft)  ft. S       | Heat Re (BTU/            | Mode    | Type  Design | Fuel  | BIU/hr  Stack I | Temperature (°F)            |

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| ltimate disposal<br>sh, etc.): | of any | effluent | than | • | emitted | from | the | stack | (scrubber | water |
|--------------------------------|--------|----------|------|---|---------|------|-----|-------|-----------|-------|
|                                |        |          |      |   |         |      |     |       |           |       |

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

# SECTION V: SUPPLEMENTAL REQUIREMENTS (SEE PAGE 7a - c of 12)

Please provide the following supplements where required for this application.

- 1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]
- 2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 6D 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 croas-section sketch, design pressure drop, etc.)
- 5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).
- 6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.
- 7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of air-borne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).
- 8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

#### SECTION V: SUPPLEMENTAL INFORMATION

#### 1. Process input/production rates

#### Input Rate

Molten sulfur input rate to tank

- = 1000 tonne/hr x 2200 lb/ton
- = 2,200,000 lb/hr

Annual throughput @ 1.2 MM tonnes for the entire facility.

Assume annual throughput will be equally distributed between the three tanks.

- = 1,2000,000/3
- = 400,000 tonne/yr

Time required to transfer sulfur to tank

- = 400,000 tonne/yr x 1/1000 tonne/hr
- = 400 hr/yr

#### Sulfur Withdrawal

Maximum sulfur withdrawal rate is approximately 300 tonnes/hr. The sulfur is pumped to one of three covered sumps that serve the sulfuric acid plants.

#### 2/3. Controlled and Uncontrolled Emissions

In all probability, Tank No. 2 will be expanded from 10,000 tonne capacity to 18,000 tonne capacity within 9 months of receipt of permit. Hence, this permit application addresses the expanded tank. If the tank is not expanded, the configuration will be as shown in Drawing SK-2. The roof vents, except for the single center vent, will be sealed. Seal details are shown in Drawing SK-4.

If the tank capacity is increased to 18,000 tonnes, the tank will be as shown in Drawing SK-3 (Tank No. 3); with the roof rim vents sealed as shown in Drawing SK-4. Emissions from the tank will be essentially the same regardless of capacity.

Emission measurements made on a single vent molten sulfur storage tank (Pennzoil) demonstrated that the ventilation rate of the tank (wind induced), while the tank is sitting idle (or while sulfur is being withdrawn) is approximately 30 dscfm. These measurements also indicated the sulfur particle concentration in the air vented from the

tank is in the range of 0.46 grains per dscf.

Measurements made on the Gardinier molten sulfur storage tanks in November 1988 (multiple vents on the tanks) showed a sulfur particle concentration in the vented gas of 0.51 grains per dscf when molten sulfur was being pumped into the tanks at the rate of 1000 tonnes per hour and 0.29 grains per dscf when the tanks were sitting idle.

For calculating emissions from the tank, the following conditions have been established:

#### Tank Filling

Ventilation Rate = 330 dscfm (Ventilation due to inflow of 1000

tonnes/hr molten sulfur plus wind induced

ventilation)

Sulfur Particle

Concentration = 0.51 grains/dscf

Time = 400 hr/yr

Tank Idle

Ventilation Rate = 30 dscfm (from Pennzoil report)

Sulfur Particle

Concentration = 0.29 grains/dscf

Time = 8760-400

= 8360 hr/yr

Emissions were estimated for the single vent only as rim vents will be sealed as shown in Drawing SK-4.

#### Tank Filling

Emissions =  $330 \text{ cfm } \times 60 \text{ min/hr}$ 

x 0.51 gr/cf x 1/7000 gr/lb

= 1.44 lb/hr

x 400 hr/yr x 1/2000

= 0.29 tpy

#### Tank Idle

**Emissions** 

30 dscfm x 60 min/hr x 0.29 gr/cf

x 1/7000 0.075 lb/hr

x 8360 hr/yr x 1/2000

0.31 tpy

#### Total Emissions

Hourly

0.075 to 1.44 lb/hr

Annual

0.60 tpy

- 4. Control System See Drawing SK-4 for vent seal design
- 5. Control Efficiency Not Applicable
- System Flow Diagram 6. Attachment 1
- 7. Location Map Attachment 2
- 8. Site Map Attachment 3
- Permit Fee 9. \$200 for the molten sulfur system
- 10. Not Applicable

| 9.  | The appropriate application fee in accormade payable to the Department of Enviro | dance with Rule 17-4.05. The check should be nmental Regulation.                              |
|-----|--|---|
| 10. |  | t, attach a Certificate of Completion of Con-<br>vas constructed as shown in the construction |
| Α.  | (NOT APPLIC  | LABLE CONTROL TECHNOLOGY CABLE) ationary sources pursuant to 40 C.F.R. Part 60                |
|     | [ ] Yes [ ] No   |   |
|     | Contaminant  | Rate or Concentration   |
| J.  |  |   |
|     |  |   |
|     |  |   |
|     |  |   |
| В.  | Has EPA declared the best available con yes, attach copy)                        | trol technology for this class of sources (If   |
|     | [ ] Yes [ ] No   |   |
|     | Contaminant  | Rate or Concentration   |
|     |  |   |
|     |  |   |
|     |  |   |
|     |  |   |
| c.  | What emission levels do you propose as be  | est available control technology?   |
|     | Contaminant  | Rate or Concentration   |
| _   |  |   |
|     | ·····  | <del>-</del>  |
|     |  |   |

- D. Describe the existing control and treatment technology (if any).
  - i. Control Device/System:

2. Operating Principles:

3. Efficiency:\*

4. Capital Costs:

\*Explain method of determining

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|    | 5.   | Useful Life:  |         | 6.           | Operating Costs:      |  |
|----|--|---|---------|--------------|-----------------------|--|
|    | 7.   | Energy:   |         | 8.           | Maintenance Cost:     |  |
|    | 9.   | Emissions:  |         |              |                       |  |
|    |  | Contaminant   |         |              | Rate or Concentration |  |
|    | <del></del>  |   |         | <del>'</del> |                       |  |
|    |  | _ <del>_</del>  |         | _            |                       |  |
|    |  |   |         |              |                       |  |
|    | 10.  | Stack Parameters  |         |              | . ,                   |  |
|    | a.   | Height:   | ft.     | b.           | Diameter: ft.         |  |
|    | c.   | Flow Rate:  | ACFM    | d.           | Temperature: °F.      |  |
|    | ٠.   | Velocity:   | FPS     |              |                       |  |
| ε. | Describe the control and treatment technology available (As many types as applicabluse additional pages if necessary). |   |         |              |                       |  |
|    | 1.   |   |         |              |                       |  |
|    | a.   | Control Device:   |         | ь.           | Operating Principles: |  |
|    | c.   | Efficiency: 1   |         | d.           | Capital Cost:         |  |
|    | e.   | Useful Life:  |         | f.           | Operating Cost:       |  |
|    | g.   | Energy: <sup>2</sup>  |         | h.           | Maintenance Cost:     |  |
|    | i.   | Availability of construction materials and process chemicals:   |         |              |                       |  |
|    | j.   | j. Applicability to manufacturing proceases:  |         |              |                       |  |
|    | k.   | Ability to construct with control device, install in available space, and operate within proposed levels: |         |              |                       |  |
|    | 2.   |   |         |              |                       |  |
|    | a.   | Control Device:   |         | ь.           | Operating Principles: |  |
|    | c.   | Efficiency: 1   |         | d.           | Capital Cost:         |  |
|    | е.   | Useful Life:  |         | f.           | Operating Cost:       |  |
|    | g.   | Energy: <sup>2</sup>  |         | h.           | Maintenance Cost:     |  |
|    | i.   | Availability of construction ma   | sterial | s an         | d process chemicals:  |  |
|    |  | n method of determining efficier<br>to be reported in units of elec                                       |         | pow          | er – KWH design rate. |  |
|    |  | m 17-1.202(1)<br>ve Navember 30, 1982   | Page    | 9 of         | 12                    |  |

Applicability to manufacturing processes: Ability to construct with control device, install in available space, and operate within proposed levels: 3. Control Device: Operating Principles: я. Efficiency: 1 . d. Capital Cost: C. Useful Life: Operating Cost: e. Energy: 2 Maintenance Cost: g. Availability of construction materials and process chemicals: i. Applicability to manufacturing processes: j. Ability to construct with control device, install in available space, and operate k. within proposed levels: 4. Control Device: b. Operating Principles: a. Efficiency: 1 d. Capital Costs: c. Useful Life: Operating Cost: Energy: 2 Maintenance Cost: α. Availability of construction materials and process chemicals: i. Applicability to manufacturing processes: Ability to construct with control device, install in available space, and operate within proposed levels: Describe the control technology selected: 2. Efficiency: 1 Control Device: Useful Life: 3. Capital Cost: 4. Operating Cost: Energy: 2 5. 6. Manufacturer: 7. Maintenance Cost: 8. Other locations where employed on similar processes: a. (1) Company: (2) Mailing Address: (3) City: (4) State: <sup>1</sup>Explain method of determining efficiency.  $^2$ Energy to be reported in units of electrical power - KWH design rate. DER Form 17-1.202(1)

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| (5) Environmental Manager   | ::                                   |                    |                   |                     |
|---|--------------------------------------|--------------------|-------------------|---------------------|
| (6) Telephone No.:  |                                      |                    |                   |                     |
| (7) Emissions: 1  |                                      |                    |                   |                     |
| Contaminant   |                                      |                    | Rate or Conc      | entration           |
|   | · · ·                                |                    |                   |                     |
|   |                                      |                    |                   |                     |
| ·   |                                      |                    |                   |                     |
| (8) Process Rate: 1   |                                      |                    |                   |                     |
| b. (1) Company:   |                                      |                    |                   |                     |
| (2) Mailing Address:  |                                      |                    |                   |                     |
| (3) City:   |                                      | (4) State:         |                   |                     |
| (5) Environmental Manager   | <b>:</b>                             |                    |                   |                     |
| (6) Telephone No.:  |                                      |                    |                   |                     |
| (7) Emissions: 1  |                                      |                    |                   |                     |
| Contaminant   |                                      |                    | Rate or Conce     | entration           |
| (8) Process Rate: 1   |                                      |                    |                   |                     |
| •   |                                      |                    |                   |                     |
| 10. Reason for selection  Applicant must provide this available, applicant must sta | information when<br>te the reason(s) | available.<br>why. |                   | s information not b |
| ·   | - PREYENTION OF (NOT APPLICABLE)     |                    | DETERIORATIO      | N                   |
| 1no. sites  | TSP,                                 | ()                 | so <sup>2</sup> * | Wind spd/dir        |
| Period of Monitoring  |                                      | -                  | month day         |                     |
| Other data recorded   |                                      |                    | -                 |                     |
| Attach all data or statist  |                                      |                    |                   |                     |
|   |                                      | • •                |                   |                     |
| Specify bubbler (B) or contin   | uous (C).                            |                    |                   |                     |
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|     | ·  |  |
|-----|--|--|
|     | a. Was instrumentation EPA referenced or   | tits equivalent? [ ] Yes [ ] No  |
|     | b. Was instrumentation calibrated in acc   | cordance with Department procedures?   |
|     | [ ] Yes [ ] No [ ] Unknown   |  |
| В.  | Meteorological Data Used for Air Quality   | Modeling   |
|     | 1 Year(s) of data from/ month day  | year month day year  |
|     | 2. Surface data obtained from (location)   |  |
|     | <ol><li>Upper air (mixing height) data obtain</li></ol>  | ed from (location)   |
|     | 4. Stability wind rose (STAR) data obtai   | ned 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 sho ciple output tables.   | wing input data, receptor locations, and prin-   |
| D.  | Applicants Maximum Allowable Emission Dat  | a ·  |
|     | Pollutant Emission Rat   | е  |
|     |  | grams/sec  |
|     | •  | grams/sec  |
| Ε.  | Emission Data Used in Modeling   |  |
|     |  | n data required is source name, description of coordinates, stack data, allowable emissions, |
| F . | Attach all other information supportive t  | o the PSD review.  |
| G.  | Discuss the social and economic impact of<br>ble technologies (i.e., jobs, payroll,<br>assessment of the environmental impact of |  |

2. Instrumentation. Field and Laboratory

the requested best available control technology.

Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of

TANK NO. 3

#### STATE OF FLORIDA

# DEPARTMENT OF ENVIRONMENTAL REGULATION



#### INFORMATION FOR TANK NO. 3

| SOURCE TYPE: Molten Sulfur Storage Tank [ ] New1             | [X] Existing $I$               |
|--|--------------------------------|
| APPLICATION TYPE: [ $\chi$ ] Construction [] Operation [] Mo | odification                    |
| COMPANY NAME: Gardinier, Inc.                                | COUNTY: Hillsborough           |
| Identify the specific emission point source(s) addressed in  | in this application (i.e. Lime |
| Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas    | Fired) Tank No. 3              |
| SOURCE LOCATION: Street U. S. 41                             | City Gibsonton                 |
| UTM: East (17) 363.0 km                                      | North 3082.3 km '              |
| Latitude <u>27° 51' 36''N</u>                                | Longitude 82 ° 23 ' 29 "W      |
| APPLICANT NAME AND TITLE: E. O. Morris, Environmental Ma     | nager                          |
| APPLICANT ADDRESS: P. O. Box 3269, Tampa, Florida 3360       | 1                              |

## SECTION II: GENERAL PROJECT INFORMATION

| Describe the nature and extent of the project. Refer to pollution control equipment and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.  |
|---|
| See page 2a of 12.  |
|   |
|   |
|   |
| Schedule of project covered in this application (Construction Permit Application On)  |
| Start of Construction August 1989 Completion of Construction February 1992  |
| Costs of pollution control system(s): (Note: Show breakdown of estimated costs on for individual components/units of the project serving pollution control purposes.  |
| Information on actual costs shall be furnished with the application for operation permit.)  |
| Information on actual costs shall be furnished with the application for operation permit.)  |
| Information on actual costs shall be furnished with the application for operation permit.)  |
| Information on actual costs shall be furnished with the application for operation permit.)  |
| Information on actual costs shall be furnished with the application for operation permit.)  Tank vents will be modified but no air pollution control equipment will be required.  |
| Information on actual costs shall be furnished with the application for operation permit.)  |
| Information on actual costs shall be furnished with the application for operation permit.)  Tank vents will be modified but no air pollution control equipment will be required.  |
| Information on actual costs shall be furnished with the application for operation permit.)  Tank vents will be modified but no air pollution control equipment will be required.  Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates. |
| Information on actual costs shall be furnished with the application for operation permit.)  Tank vents will be modified but no air pollution control equipment will be requi  Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.     |

SECTION II: A.

Permitting of existing molten sulfur storage Tank No. 3 to comply with Rules 17-2 and 17-4, FAC. The tank has a capacity of 18,000 tonnes (long tons) of sulfur and will be modified to a single vent tank within 120 days of the receipt of the permit. (The single vent will be located at the center of the tank roof.) Drawing SK-3 shows the present configuration of Tank No. 3 and Drawing SK-4 shows the details of the vent seals.

Sulfur particle emissions from the tank will be less than one ton per year and the tank will operate in compliance with all applicable rules in Chapter 17-2, FAC.

|    | this is a new source or major modification, answer the following quest es or No) Existing minor source                             | ions. |
|----|--|-------|
| ı. | Is this source in a non-attainment area for a particular pollutant?  | NA    |
|    | a. If yes, has "offset" been applied?  |       |
|    | b. If yes, has "Lowest Achievable Emission Rate" been applied?   |       |
|    | c. If yes, list non-attainment pollutants.   | ····  |
| 2. | Does best available control technology (BACT) apply to this source? If yes, see Section VI.  | NA    |
| 3. | Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections VI and VII. | NA ·  |
| 4. | Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source?  | NA    |
| 5. | Do "National Emission Standards for Hazardous Air Pollutants"<br>(NESHAP) apply to this source?                                    | NA    |
|    | "Reasonably Available Control Technology" (RACT) requirements apply this source?   | NO    |
|    | a. If yes, for what pollutants?  |       |

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:

|                   | Contam        | inants      | Utilization   |                        |  |  |
|-------------------|---------------|-------------|---------------|------------------------|--|--|
| Description       | Туре          | % Wt        | Rate - lbs/hr | Relate to Flow Diagram |  |  |
| Molten Sulfur     | None          | -           | 2,200,000*    | 3A                     |  |  |
|                   | ·             |             |               |                        |  |  |
|                   |               |             |               |                        |  |  |
|                   |               |             |               |                        |  |  |
| *Transfer rate of | molten sulfur | from vessel | to tank.      |                        |  |  |

- B. Process Rate, if applicable: (See Section V, Item 1)
  - 1. Total Process Input Rate (lbs/hr): NA Molten sulfur storage
  - 2. Product Weight (lbs/hr):NA Molten sulfur storage
- C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

| Name of      | Emiss             | ionl           | Allowed <sup>2</sup><br>Emission<br>Rate per | Allowable <sup>3</sup><br>Emission | Potent<br>Emiss | Relate<br>to Flow |         |
|--------------|-------------------|----------------|--|------------------------------------|-----------------|-------------------|---------|
| Contaminant  | Maximum<br>lbs/hr | Actual<br>T/yr | Rule<br>17-2                                 | lbs/hr                             | lbs/yr          | T/yr              | Diagram |
| Part. Matter |                   |                |  |                                    |                 |                   |         |
| (1)          | 1.44              | 0.29           |  | -                                  | 1.44            | 0.29              | 3C      |
| (2)          | 0.08              | 0.31           | -  | -                                  | 0.08            | 0.31              | 3C      |
| Total        | _                 | 0.60           | 17-2.600(11)                                 | (e)2 <1.0 tp                       | /               | 0.60              | 3C      |
|              |                   |                |  |                                    |                 |                   |         |

<sup>(1)</sup> Sulfur pumped to tank at 1000 tonnes/hr; (2) Tank sitting idle or with sulfur being withdrawn See Section V, Item 2.

<sup>&</sup>lt;sup>2</sup>Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

<sup>&</sup>lt;sup>3</sup>Calculated from operating rate and applicable standard.

 $<sup>^{4}</sup>$ Emission, if source operated without control (See Section V, Item 3).

| Name and Type<br>(Model & Serial No.) | Contaminant      | Efficiency   | Size (in    | f Particles<br>Collected<br>microns)<br>plicable) | Basis for<br>Efficiency<br>(Section V<br>Item 5) |
|---------------------------------------|------------------|--------------|-------------|---|--|
| NONE                                  |                  |              |             |   |  |
| _                                     |                  |              |             |   |  |
|                                       |                  |              |             |   |  |
|                                       |                  |              |             |   |  |
|                                       |                  |              |             |   |  |
| . Fuels                               |                  | Consumption* |             |   |  |
| Type (Be Specific)                    | avg/hr           |              | max./hr     |   | Heat Input<br>BTU/hr)                            |
| NONE                                  |                  |              |             |   |  |
|                                       |                  |              | ,           |   |  |
|                                       |                  |              |             |   |  |
| Units: Natural GasMMC                 | F/hr; Fuel Oils- | gallons/hr;  | Coal, wood, | refuse, othe                                      | rlbs/hr.   |
| uel Analysis:                         |                  | 9            | -t Ach.     |   |  |
| ercent Sulfur:                        |                  |              |             |   |  |
| leat Capacity:                        | <u>.</u>         |              |             |   | 07.11./  |
| ther Fuel Contaminants                | (which may cause | air polluti  | on):        |   |  |
|                                       |                  |              |             |   |  |
| T. If applicable, indic               |                  |              |             |   |  |
| i. Indicate liquid or s  NONE         | •                |              |             |   |  |
|                                       |                  |              |             | ,   |  |
|                                       |                  |              |             |   |  |
|                                       |                  |              |             |   |  |

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| tack Heig  | jht:   | 32  |                      | ft. S             | Stack Diamete                  | 0.8          | 3                | ft |
|--|--|---|----------------------|-------------------|--------------------------------|--------------|------------------|----|
| as Flow R  | ate: 40/44                                       | 5ACFM_3                                       | 30/330               | _DSCFM G          | Gas Exit Temp                  | erature:     | 240              | of |
| ater Vapo  | r Content:                                       | 2   |                      | % v               | /elocity:                      | 1.2/13.6     |                  | FP |
|  |  | SECT  | ION IV:              | INCINERAT         | OR INFORMATI                   | ON           |                  |    |
|  |  |   | (NOT APF             | PLICABLE)         |                                |              | <del></del>      |    |
| Type of<br>Waste   | • •  |   |                      |                   | II Type IV (Patholog-<br>ical) |              |                  |    |
| Actual<br>lb/hr<br>Inciner-<br>ated  |  |   |                      |                   |                                |              |                  |    |
| Uncon-   |  |   |                      |                   | _                              |              |                  |    |
|  |  | <u>, , , , , , , , , , , , , , , , , , , </u> |                      |                   |                                |              |                  | _  |
| (lbs/hr) escriptio otal Weig   | e Number of                                      | ted (lbs/h                                    | r)                   | per day           | Design Cap                     |              |                  |    |
| (lbs/hr) escriptio otal Weig pproximat   | ht Incinera<br>e Number of                       | ted (lbs/h                                    | r)                   | per day           |                                | wk           | wks/yr           |    |
| (lba/hr) escriptio otal Weig pproximat   | ht Incinera<br>e Number of                       | ted (lbs/h                                    | r)                   | per day  Model    | day/                           | wk           | wks/yr           |    |
| (lbs/hr) escriptio otal Weig oproximat   | ht Incinera e Number of er ructed                | ted (lbs/h<br>Hours of I                      | r)<br>Operation      | per day  Model    | No                             | wk           | wks/yr           |    |
| (lbs/hr) escription otal Weig oproximate anufactur ate Const   | ht Incinera e Number of er ructed                | ted (lbs/h<br>Hours of I                      | r)<br>Operation      | per day  Model    | No                             | wk           | wks/yr           |    |
| (lbs/hr) escriptio otal Weig oproximat anufactur ate Const   | ht Incinera e Number of er ructed hamber Chamber | ted (lbs/h Hours of I                         | T) Operation Heat Re | Model             | No day/                        | BTU/hr       | Temperatu:       | re |
| escription tal Weig oproximate constant | ht Incinera e Number of er ructed hamber Chamber | Volume (ft)3                                  | Heat Re (BTU)        | Model elease /hr) | No                             | BTU/hr Stack | Temperatu: ( °F) | re |

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| rief descriptio               |      |     |          |       | <br> |         |      |     |       |           |       |
|-------------------------------|------|-----|----------|-------|------|---------|------|-----|-------|-----------|-------|
|                               |      | _   |          |       |      |         |      |     |       |           |       |
| ltimate disposa<br>sh, etc.): | l of | any | effluent | other |      | emitted | from | the | stack | (scrubber | water |
|                               |      |     |          |       |      |         |      |     |       |           |       |
|                               |      |     |          |       |      |         |      |     |       |           |       |

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

# SECTION V: SUPPLEMENTAL REQUIREMENTS (SEE PAGE 7a - c of 12)

Please provide the following supplements where required for this application.

- 1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]
- 2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.
- 3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).
- 4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section aketch, design pressure drop, etc.)
- With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).
- 6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where soiled and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.
- 7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).
- 8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

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#### SECTION V: SUPPLEMENTAL INFORMATION

#### Process input/production rates

#### Input Rate

Molten sulfur input rate to tank

- = 1000 tonne/hr x 2200 lb/ton
- = 2,200,000 1b/hr

Annual throughput @ 1.2 MM tonnes for the entire facility.

Assume annual throughput will be equally distributed between the three tanks.

- = 1,2000,000/3
- = 400,000 tonne/yr

Time required to transfer sulfur to tank

- = 400,000 tonne/yr x 1/1000 tonne/hr
- = 400 hr/yr

#### Sulfur Withdrawal

Maximum sulfur withdrawal rate is approximately 300 tonnes/hr. The sulfur is pumped to one of three covered sumps that serve the sulfuric acid plants.

#### 2/3. Controlled and Uncontrolled Emissions

Emissions will be controlled by placing vent covers on the six roof rim vents (See Drawings SK-3 and SK-4 in the attachment package) and by capping the 10-inch diameter overflow in the north side-wall of the tank (See Drawing SK-3). This will result in the tank being vented by a single 10-inch diameter gooseneck vent in the center of the tank roof (See Drawing SK-3).

Emission measurements made on a single vent molten sulfur storage tank (Pennzoil) demonstrated that the ventilation rate of the tank (wind induced), while the tank is sitting idle (or while sulfur is being withdrawn) is approximately 30 dscfm. These measurements also indicated the sulfur particle concentration in the air vented from the tank is in the range of 0.46 grains per dscf.

Measurements made on the Gardinier molten sulfur storage tanks in November 1988 (multiple vents on the tanks) showed a sulfur particle concentration in the vented gas of 0.51 grains per dscf when molten sulfur was being pumped into the tanks at the rate of 1000 tonnes per hour and 0.29 grains per dscf when the tanks were sitting idle.

For calculating emissions from the tank, the following conditions have been established:

#### Tank Filling

Ventilation Rate = 330 dscfm (Ventilation due to inflow of 1000
tonnes/hr molten sulfur plus wind induced

ventilation)

Sulfur Particle

Concentration = 0.51 grains/dscf

Time = 400 hr/yr

Tank Idle

Ventilation Rate = 30 dscfm (from Pennzoil report)

Sulfur Particle

Concentration = 0.29 grains/dscf

Time = 8760-400

= 8360 hr/yr

Emissions were estimated for the single vent only as rim vents will be sealed as shown in Drawing SK-4.

#### Tank Filling

Emissions = 330 cfm x 60 min/hr

x 0.51 gr/cf x 1/7000 gr/lb

= 1.44 lb/hr

x 400 hr/yr x 1/2000

= 0.29 tpy

#### Tank Idle

Emissions =  $30 \operatorname{dscfm} \times 60 \operatorname{min/hr} \times 0.29 \operatorname{gr/cf}$ 

x 1/7000

= 0.075 lb/hr

x 8360 hr/yr x 1/2000

= 0.31 tpy

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#### Total Emissions

Hourly - 0.075 to 1.44 lb/hr Annual - 0.60 tpy

- 4. Control System

  See Drawing SK-4 for vent seal design
- 5. Control Efficiency Not Applicable
- 6. System Flow Diagram Attachment 1
- 7. Location Map
  Attachment 2
- 8. Site Map Attachment 3
- 9. Permit Fee \$200 for the molten sulfur system
- 10. Not Applicable

| 9.      | The appropriate application fee in                    | accordance with Rule 17-4.05. The check should be   |
|---------|---|---|
|         | made payable to the Department of Er                  |   |
| 10.     |   | permit, attach a Certificate of Completion of Concre was constructed as shown in the construction |
|         | SECTION VI: BEST                                      | AVAILABLE CONTROL TECHNOLOGY  |
| Α.      | (NOT AF   | PPLICABLE) w stationary sources pursuant to 40 C.F.R. Part 60                                     |
|         | [ ] Yes [ ] No  |   |
|         | Contaminant   | Rate or Concentration   |
|         |   |   |
|         |   |   |
| <u></u> | 0   |   |
| в.      | Has EPA declared the best available yes, attach copy) | control technology for this class of sources (If  |
|         | [ ] Yes [ ] No  |   |
|         | Contaminant   | Rate or Concentration   |
|         |   |   |
|         |   |   |
| С.      | What emission levels do you propose                   | as best available control technology?   |
|         | Contaminant   | Rate or Concentration   |
|         |   |   |
|         |   |   |
|         |   |   |
| D.      | Describe the existing control and tr                  | eatment technology (if any).  |
|         | 1. Control Device/System:                             | 2. Operating Principles:  |
|         | 3. Efficiency:*                                       | 4. Capital Costs:   |
| *Exp    | plain method of determining                           |   |

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|                                    |      | •   |               |       |                                     |         |
|------------------------------------|------|---|---------------|-------|-------------------------------------|---------|
|                                    | 5.   | Useful Life:  |               | 6.    | Operating Costs:                    |         |
|                                    | 7.   | Energy:   | -             | 8.    | Maintenance Cost:                   |         |
|                                    | 9.   | Emissions:  |               |       |                                     |         |
|                                    |      | Contaminant   |               |       | Rate or Concentration               | ,       |
|                                    |      |   |               |       | <del></del>                         |         |
|                                    |      |   |               |       |                                     |         |
|                                    |      |   |               |       |                                     |         |
|                                    | 10.  |   |               |       |                                     |         |
|                                    | а.   | Height:   | ft.           |       | Diameter:                           | ft.     |
|                                    | c.   | Flow Rate:  | ACFM          | d.    | Temperature:                        | °F.     |
|                                    | е.   | Velocity:   | FPS           |       |                                     |         |
| ٤.                                 |      | cribe the control and treatment additional pages if necessary).     |               | olog  | y available (As many types as appl  | icable, |
|                                    | 1.   |   |               |       |                                     |         |
|                                    | a.   | Control Device:   |               | b.    | Operating Principles:               |         |
|                                    | c.   | Efficiency: 1   |               | d.    | Capital Cost:                       |         |
|                                    | е.   | Useful Life:  |               | f.    | Operating Cost:                     |         |
|                                    | g.   | Energy: <sup>2</sup>  |               | h.    | Maintenance Cost:                   |         |
|                                    | i.   | Availability of construction ma                                     | terial        | ls an | d process chemicals:                |         |
|                                    | j.   | Applicability to manufacturing                                      | proces        | ses:  | •                                   |         |
|                                    | k.   | Ability to construct with containing proposed levels:               | rol de        | vice  | , install in available space, and o | perate  |
|                                    | 2.   |   |               |       |                                     |         |
|                                    | a.   | Control Device:   |               | ь.    | Operating Principles:               |         |
|                                    | c.   | Efficiency: 1   | :             | d.    | Capital Cost:                       |         |
|                                    | e.   | Useful Life:  | -             | f.    | Operating Cost:                     |         |
|                                    | g.   | Energy: <sup>2</sup>  |               | h.    | Maintenance Cost:                   |         |
|                                    | i.   | Availability of construction ma                                     | terial        | ls an | d process chemicals:                |         |
| 1 <sub>Ex</sub><br>2 <sub>En</sub> | plai | n method of determining efficien<br>to be reported in units of elec | cy.<br>trical | l pow | er – KWH design rate.               |         |

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Applicability to manufacturing processes: Ability to construct with control device, install in available space, and operate within proposed levels: 3. Control Device: Operating Principles: a. Efficiency: 1 Capital Cost: c. d. Useful Life: f. Operating Cost: e. Energy: 2 h. Maintenance Cost: q. Availability of construction materials and process chemicals: Applicability to manufacturing processea: Ability to construct with control device, install in available space, and operate k. within proposed levels: 4. Control Device: b. Operating Principles: Efficiency: 1 Capital Coats: c. Useful Life: Operating Cost: f. Energy: 2 Maintenance Cost: q. i. Availability of construction materials and process chemicsls: Applicability to manufacturing processes: Ability to construct with control device, install in available space, and operate within proposed levels: Describe the control technology selected: Efficiency: 1 1. Control Device: 3. Capital Cost: Useful Life: Energy: 2 5. Operating Cost: 7. Maintenance Cost: Manufacturer: Other locations where employed on similar processes: a. (1) Company: (2) Mailing Address: (3) City: (4) State:  $^{
m l}$ Explain method of determining efficiency.  $^2$ Energy to be reported in units of electrical power - KWH design rate.

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F.

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|     | (5) Environmental Manager:                                    |                                   |            |                                |
|-----|---|-----------------------------------|------------|--------------------------------|
|     | (6) Telephone No.:  |                                   |            | •                              |
|     | (7) Emissions: 1  |                                   |            |                                |
|     | Contaminant   |                                   |            | Rate or Concentration          |
|     |   |                                   |            |                                |
|     |   |                                   |            |                                |
|     | (8) Process Rate: 1   |                                   |            |                                |
|     | b. (1) Company:   | J.                                |            |                                |
|     | (2) Mailing Address:  |                                   |            |                                |
|     | (3) City:   | (                                 | 4) State:  |                                |
|     | (5) Environmental Manager:                                    |                                   |            |                                |
|     | (6) Telephone No.:  |                                   |            |                                |
|     | (7) Emissions: 1  |                                   |            |                                |
|     | Contaminant   |                                   |            | Rate or Concentration          |
|     |   |                                   |            |                                |
|     | (8) Process Rate: 1   |                                   |            |                                |
|     | 10. Reason for selection an                                   | d description of                  | systems:   |                                |
|     | plicant must provide this in<br>ailable, applicant must state |                                   |            | Should this information not    |
| Α.  |   | PREVENTION OF S<br>OT APPLICABLE) | IGNIFICANT | DETERIORATION                  |
|     | 1no. sites  | TSP,                              | ()         | SO <sup>2</sup> * Wind spd/dir |
|     | Period of Monitoring  |                                   |            | month day year                 |
|     | Other data recorded   |                                   |            |                                |
|     | Attach all data or statistics                                 | al summaries to                   | this appli | cation.                        |
| +Sp | scify bubbler (B) or continuou                                | 18 (C).                           |            |                                |
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| 2.   | . Instrumentation, Field and Laboratory  |           |           |            |             |
|------|--|-----------|-----------|------------|-------------|
| 8.   | . Was instrumentation EPA referenced or its equ  | uivalent? | [ ] Yes   | [ ] No     |             |
| ь.   | . Was instrumentation calibrated in accordance   | with Dep  | artment p | rocedures? | •           |
|      | []Yes []No []Unknown   |           |           |            |             |
| Met  | teorological Data Used for Air Quality Modeling  | 3         |           |            |             |
| 1.   | Year(s) of data from // t  | o         | day yea   | _<br>r     |             |
| 2.   | Surface data obtained from (location)  |           |           | ···        |             |
| 3.   | Upper air (mixing height) data obtained from   | (location | n)        |            |             |
| 4.   | Stability wind rose (STAR) data obtained from  | (locatio  | o∙n)      | • <u> </u> |             |
| Come | mputer Models Used   | -         | <u></u>   |            |             |
| •    |  | lodified? | If ves    | attach de  | escrintion. |
|      |  |           |           |            |             |
|      |  |           |           |            |             |
| 3.   |  |           |           |            |             |
| 4.   | н  | lodified? | If yes,   | attach de  | scription.  |
|      | tach copies of all final model runa showing inpuble output tables.   | out data, | receptor  | locations  | , and prin- |
| Арр  | plicants Maximum Allowable Emisaion Data   |           |           |            |             |
| Poli | llutant Emission Rate  |           |           |            |             |
| 1    | TSP  | gr        | ams/sec   |            |             |
| S    | S 0 2  | gr        | ams/sec   |            |             |
| Emia | iasion Data Uaed in Modeling   |           |           |            |             |
| poin | tach list of emission sources. Emission data re<br>int source (on NEDS point number), UTM coordins<br>d normal operating time. |           |           |            |             |

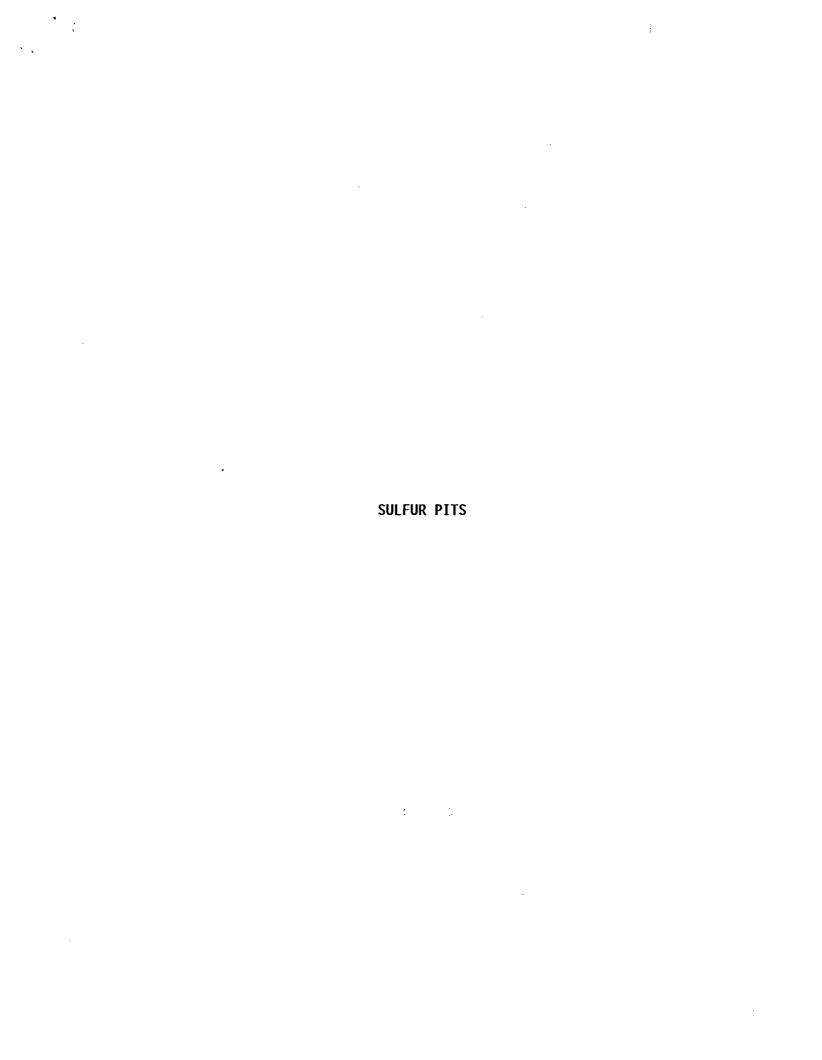
- F. Attach all other information supportive to the PSD review.
- G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.
- H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.

В.

С.

D.

E.



#### STATE OF FLORIDA

## DEPARTMENT OF ENVIRONMENTAL REGULATION



#### INFORMATION FOR SULFUR PITS

| SOURCE TYPE: Molten Sulfur Pits               | [ ] New <sup>1</sup> [X] Existing <sup>1</sup>       |
|---|--|
| APPLICATION TYPE: [X] Construction [ ] Oper   | ation [ ] Modification                               |
| COMPANY NAME: Gardinier, Inc.                 | COUNTY: Hillsborough                                 |
| Identify the specific emission point source(s | ) addressed in this application (i.e. Lime           |
| Kiln No. 4 with Venturi Scrubber; Peaking Uni | t No. 2, Gas Fired) Sulfur Pits 7, 8, and 9          |
| SOURCE LOCATION: Street U. S. 41              | City Gibsonton                                       |
| UTM: East (17) 363.0 km                       | North 3082.3 km                                      |
| Latitude <u>27</u> ° <u>51</u> ' <u>36</u> '  | N <b>Longitude <u>82</u>° <u>23</u>' <u>29</u>"W</b> |
| APPLICANT NAME AND TITLE: E. O. Morris, Envi  | ronmental Manager                                    |
| APPLICANT ADDRESS: P. O. Box 3269, Tampa, F   | Torida 33601   |

#### SECTION II: GENERAL PROJECT INFORMATION

| necessary.   |          |              |         |         |        |         |          |                 |
|--|----------|--------------|---------|---------|--------|---------|----------|-----------------|
| See page 2a o  | of 12.   |              |         |         |        |         |          |                 |
|  |          |              |         |         |        |         |          |                 |
|  |          |              |         |         | _      |         | <u> </u> |                 |
|  |          |              |         | _       |        |         |          |                 |
| Schedule of pr   | oject co | vered in thi | s appli | cation  | (Const | ruction | Permit   | Application     |
| Start of Const   | ruction  | August 1989  | 9       | Comple  | tion o | f Const | ruction  | <u>February</u> |
| Costs of pollu<br>for individual<br>Information on<br>permit.) | compane  | nts/units of | the pr  | oject s | erving | pollut  | ion conf | trol purpose    |
| No Cost.   |          |              |         |         | _      |         |          |                 |
| NO COST.   |          |              |         |         |        |         |          |                 |
| NO COST.   |          |              | _       |         | 31     |         |          |                 |
| Indicate any p   |          |              |         |         |        | associa | ted with | the emissi      |
| Indicate any p<br>point, includi                               |          |              |         |         |        | associa | ted with | the emissi      |
| Indicate any p   |          |              |         |         |        | associa | ted with | the emissi      |
| Indicate any p<br>point, includi                               |          |              |         |         |        | associa | ted with | the emissi      |
| Indicate any p<br>point, includi                               |          |              |         |         |        | associa | ted with | the emissi      |
| Indicate any p<br>point, includi                               |          |              |         |         |        | associa | ted with | the emissi      |
| Indicate any p<br>point, includi                               |          |              |         |         |        | associa | ted with | the emissi      |
| Indicate any p<br>point, includi                               |          |              |         | ration  |        |         | ted with | the emissi      |
| Indicate any p<br>point, includi                               |          |              |         | ration  | dates. |         | ted with | the emissi      |

DER Form 17-1.202(1) Effective October 31, 1982 SECTION II: A.

Permitting of existing molten sulfur pits 7, 8, and 9 to comply with Rules 17-2 and 17-4, FAC. The pits have approximate capacities of:

| <u>Pit</u> | <u>Capacity</u>          |
|------------|--------------------------|
| 7          | 115 tonnes               |
| 8<br>9     | 115 tonnes<br>145 tonnes |

and provide surge capacity between the three molten sulfur storage tanks and the sulfuric acid plants. The throughput of each tank has been assumed to be equal or 400,000 tonnes per year (one-third of the total system throughput).

Each of the three pits is partitioned into two equal compartments and each compartment of each tank has a single 3-6 inch diameter vent pipe in the cover plate. Attachment "A" shows the inside dimensions of each pit and the general configuration of the pits.

No modifications to the pits are anticipated and all pits are expected to operate in full compliance with applicable regulations, with particulate matter emissions of less than one ton per year, each.

|    | this is a new source or major modification, answer the following quest.  Existing minor source                                     | ions. |
|----|--|-------|
| l. | Is this source in a non-attainment area for a particular pollutant?  | NA    |
|    | a. If yes, has "offset" been applied?  |       |
|    | b. If yes, has "Lowest Achievable Emission Rate" been applied?   |       |
|    | c. If yes, list non-attainment pollutants.   |       |
| 2. | Does best available control technology (BACT) apply to this source? If yes, see Section VI.  | NA    |
| 3. | Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections VI and VII. | NA    |
| 4. | Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source?  | NA    |
| 5. | Do "National Emission Standards for Hazardous Air Pollutanta" (NESHAP) apply to this source?                                       | NA ,  |
|    | "Reasonably Available Control Technology" (RACT) requirements apply this source?   | NO    |
|    | a. If yes, for what pollutants?  |       |

any information requested in Rule 17-2.650 must be submitted.

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

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

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

|                  | Contami       | nants | Utilization   |                        |  |  |
|------------------|---------------|-------|---------------|------------------------|--|--|
| Description      | Туре          | # Wt  | Rate - lbs/hr | Relate to Flow Diagram |  |  |
| Molten Sulfur    | None          | -     | 660,000*      | 7A, 8A, 9A             |  |  |
|                  |               |       |               |                        |  |  |
|                  |               |       |               |                        |  |  |
|                  |               |       |               |                        |  |  |
| *Sulfur transfer | nate to pits. |       |               |                        |  |  |

| в. | Process | Rate. | i f | applicable: | (See | Section | ٧. | Itam | 1) | ı |
|----|---------|-------|-----|-------------|------|---------|----|------|----|---|
|    |         |       |     | opprade to: | (    |         |    |      | -, |   |

- 1. Yotal Process Input Rate (1bs/hr): NA
- 2. Product Weight (lba/hr): NA

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

| Name of      | Emiss             | ionl           | Allowed <sup>2</sup><br>Emission<br>Rate per | Allowable <sup>3</sup><br>Emission | Poten:<br>Emis: |      | Relate<br>to Flow |
|--------------|-------------------|----------------|--|------------------------------------|-----------------|------|-------------------|
| Contaminant  | Maximum<br>lbs/hr | Actual<br>T/yr | Rule<br>17-2                                 | lbs/hr                             | lbs/yr          | I/yr | Diagram           |
| Part. Matter |                   |                |  | (                                  |                 |      |                   |
| Filling      | 0.44              | 0.29           | . <u>-</u>                                   | _                                  | 0.44            | 0.29 | 7B, 8B, 9B        |
| Wind         | 0.01              | 0.05           | -<br>-                                       | •                                  | 0.01            | 0.05 | 7B, 8B, 9B        |
| Total        | -                 | 0.34           | 17-2.600(11)(                                | e)2 <b>&lt;</b> 1.0 †py            | -               | 0.34 | -                 |
|              |                   |                |  |                                    |                 |      |                   |

<sup>&</sup>lt;sup>1</sup>See Section V, Item 2.

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

<sup>3</sup>Calculated from operating rate and applicable standard.

 $<sup>^{4}</sup>$ Emission, if source operated without control (See Section V, Item 3).

| Name and Type<br>(Model & Serial No.) | Conteminant       | Contaminant Efficiency |           | Range of Particles Size Collected (in microns) (If applicable) |              | Basis for<br>Efficiency<br>(Section V<br>Item 5) |
|---------------------------------------|-------------------|------------------------|-----------|--|--------------|--|
| NONE                                  |                   | · ·                    |           |  |              |  |
|                                       |                   |                        |           |  |              |  |
|                                       |                   |                        |           |  |              |  |
| . Fuels                               |                   |                        |           |  |              |  |
|                                       |                   | Consu                  | ption*    |  | Maniana      | U6 T6  |
| Type (Be Specific)                    | avg/h             | <u>r</u>               | m a       | x./hr  |              | Heat Input<br>BTU/hr)                            |
| NONE                                  |                   |                        |           |  |              |  |
|                                       |                   |                        |           |  |              |  |
|                                       |                   |                        |           |  |              |  |
| Maida a Natural Cas MMC               | 25 /han 5 wal (1) | 11                     | /h C      | and wood   | nafusa stha  | - 160/b-   |
| Units: Natural GaaMMC                 | r/nr; ruel dil    | adari                  | ons/nr; c | 081, WOOd,   | reluse, othe | r108/nr.   |
| uel Analysis:<br>ercent Sulfur:       |                   |                        | Parcent   | Ach.   |              |  |
| ensity:                               |                   |                        |           |  |              |  |
| eat Capacity:                         |                   |                        |           |  |              |  |
| ther Fuel Contaminants                |                   |                        |           |  |              |  |
| ther regression amanda                | (HIIZCII Way Cas  | <b></b>                | pozitien  | /·   |              | -  |
| . If applicable, indic                | ate the percen    | t of fu                | el used f | or space h   | eating.      |  |
| nnual Average <u>NA</u>               |                   | ; ĸ                    | aximum    |  |              |  |
|                                       |                   |                        |           |  |              |  |

## Pit 7/8/9

| H. Emissio                                 | n Stack G            | eometry and                 | Flow Cha            | racteri           | stics (P                              | rovide | data for e                        | ach stack):              |        |
|--|----------------------|-----------------------------|---------------------|-------------------|---------------------------------------|--------|-----------------------------------|--------------------------|--------|
| Stack Heigh                                | t:6                  | /8/8                        | ·                   | ft.               | Stack D.                              | iamete | r: _3.5/4/6                       | 5 - in.                  | `፠፠.   |
| Gas Flow Ra                                | te: 135*             | /7**_ACFM                   | 100*/5**            | _DSCFM            | Gas Exi                               | t Temp | erature:                          | 240                      | °F.    |
| <b>Water Vapor</b> *Filling pi **Wind indu | i <b>†</b>           |                             |                     | .%                |                                       |        |                                   | /11-0.6                  | FPS    |
|  |                      | SECT                        | IVI NOT             | INCINER<br>APPLIC |                                       | DRMATI | ON                                |                          |        |
|  |                      | <u> </u>                    | (NOT                | APPLIC            | ADLE)                                 |        | -                                 | -                        |        |
| Type of<br>Waste                           | Type 0<br>(Plastics) | Type I<br>(Rubbish)         | Type II<br>(Refuse) |                   | -                                     |        | Type V<br>(Liq.& Gas<br>By-prod.) | Type VI<br>(Solid By-pro | nd.)   |
| Actual<br>lb/hr<br>Inciner-<br>ated        |                      |                             |                     |                   |                                       |        |                                   |                          |        |
| Uncon-<br>trolled<br>(1bs/hr)              |                      |                             |                     |                   |                                       |        |                                   |                          |        |
|  | Number of            | Hours of                    | Operation           | per day           |                                       |        |                                   | hr)                      |        |
| Dete Constru                               | icted                |                             |                     | Mode              | ol No                                 |        | <u> </u>                          | · · ·                    |        |
|  |                      | Volume<br>(ft) <sup>3</sup> | Heat Re             | _                 | Туре                                  | Fuel   | BTU/hr                            | Temperature<br>(°F)      |        |
| Primary Cha                                | mber                 |                             |                     |                   |                                       |        |                                   |                          |        |
| Secondary C                                | hamber               |                             |                     |                   |                                       |        |                                   |                          |        |
| Stack Height                               | :                    | ft. :                       | Stack Diam          | ter: _            | · · · · · · · · · · · · · · · · · · · |        | Stack Te                          | emp                      |        |
|  |                      |                             |                     |                   |                                       |        |                                   |                          |        |
| *If 50 or mo<br>dard cubic f               |                      |                             |                     |                   |                                       | emissi | ions rate in                      | n grains per s           | t an – |
| Type of poll                               |                      |                             |                     |                   | •                                     | Scrubt | per [ ] Aft                       | erburner                 |        |
|  |                      |                             | [ ] Ot              | her (sp           | ecify)                                |        |                                   |                          |        |
| DER Form 17-                               | 1.202(1)             |                             |                     |                   |                                       |        |                                   |                          |        |

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#### SECTION V: SUPPLEMENTAL INFORMATION

#### 1. Process Input/Production Rates

The sulfur pits receive molten sulfur from one of the three molten sulfur storage tanks and provide surge capacity between the storage tanks and the sulfuric acid plants. The maximum sulfur transfer rate to the pits is approximately 300 tonnes per hour and the sulfur withdrawal rates range from 80 to 100 tonnes per hour depending upon the operating rates of the three sulfuric acid plants.

#### 2/3. Controlled and Uncontrolled Emissions

Sulfur particle emissions from the three pits result from sulfur vapors that are displaced from the pits as sulfur is transferred to the pits and as a result of wind induced ventilation through the pit vents. Each pit is partitioned into two sections (Attachment A) and each section has a single vent. As a result, each pit section is similar to a single vent molten sulfur storage tank. The ventilation rates of the pits have therefore been estimated on the same basis as molten sulfur storage tanks; with adjustments for sulfur transfer rates and vent diameters and heights.

The transfer of 300 tonnes per hour of sulfur into a pit will result in the displacement of approximately 100 dscfm of air (including wind induced ventilation). The wind induced ventilation rates of the pits have been estimated to be one-sixth the wind induced ventilation rates of the tanks (one-sixth of 30 dscfm or 5 dscfm). The factor of one-sixth was estimated considering differences in vent diameters (cross-sectional areas) - 3.5 to 6 inches vs. 10 inches for the tanks - and differences in vent heights - 6 to 8 feet vs. 25 to 30 feet for the tanks. Sulfur particle concentrations in the vented gas streams from the pits were assumed to be the same as from the tanks -0.51 grains/dscf during sulfur transfer and 0.29 grains/dscf during wind induced ventilation.

#### Pit Filling

Controlled and uncontrolled emissions are identical

Time - 400,000 tonnes per year at a transfer rate of 300 tonnes per hour

t = 400,000 tpy/300 tph

= 1333 hr/yr

Emissions = 100 cfm x 60 min/hr

x 0.51 gr/dscf  $\dot{x}$  1/7000 gr/lb

= 0.44 lb/hr

x 1333 hr/yr x 1/2000 lb/ton

= 0.29 tpy

#### Wind Induced

Time = 8760 - 1333

= 7427 hr/yr

Emissions =  $5 \text{ cfm } \times 60 \text{ min/hr } \times 0.29 \text{ gr/dscf}$ 

x 1/7000

= 0.012\_lb/hr

x 7427 hr/yr x 1/2000

= 0.05 tpy

#### Total Emissions

Hourly = 0.012 to 0.44 1b/hr

Annual = 0.34 tpy

4. See Attachment "A" for drawing of sulfur pits.

- 5. Control Efficiency Not Applicable
- 6. Flow Diagram Attachment 1
- 7. Location Map Attachment 2
- 8. Site Map Attachment 3
- 9. Permit Fee \$200 for system
- 10. Not Applicable

| Brief description             | of operating | characteristi  | cs of contro | ol devices:      |                    |
|-------------------------------|--------------|----------------|--------------|------------------|--------------------|
| •                             |              |                |              |                  |                    |
|                               |              |                |              |                  |                    |
|                               |              |                |              |                  |                    |
|                               |              | <u> </u>       |              |                  |                    |
|                               |              |                |              |                  |                    |
| Ultimate disposal ash, etc.): | of any efflu | ent other than | that emitte  | d from the stack | k (acrubber water, |
|                               |              | _              |              |                  |                    |
|                               |              |                |              |                  |                    |
|                               |              | ·              |              |                  |                    |
|                               |              |                |              |                  |                    |
|                               |              |                | <del></del>  | ·                |                    |

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

# SECTION V: SUPPLEMENTAL REQUIREMENTS SEE PAGE 7a-b bf 12

Please provide the following supplements where required for this application.

- 1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]
- 2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.
- 3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).
- 4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.)
- 5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).
- 6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.
- 7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).
- 8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

| 9.   | The appropriate application fee in acmade payable to the Department of Env.                            | cordance with Rule 17-4.05. The check should be ironmental Regulation.                             |  |  |  |
|------|--|--|--|--|--|
| 10.  |  | rmit, attach a Certificate of Completion of Con-<br>e was constructed as shown in the construction |  |  |  |
|      | SECTION VI. REST A   | VAILABLE CONTROL TECHNOLOGY  |  |  |  |
| Α.   | (NOT APPLICABLE)   |  |  |  |  |
|      | [ ] Yes [ ] No   |  |  |  |  |
|      | Contaminant  | Rate or Concentration  |  |  |  |
| us.  |  |  |  |  |  |
| •    |  |  |  |  |  |
|      |  |  |  |  |  |
|      |  |  |  |  |  |
| В.   | Has EPA declared the best available control technology for this class of sources (If yes, attach copy) |  |  |  |  |
|      | []Yea []No   |  |  |  |  |
|      | Contaminant  | Rate or Concentration  |  |  |  |
|      |  |  |  |  |  |
|      |  |  |  |  |  |
| С.   | What emission levels do you propose as   |  |  |  |  |
|      | Contaminant  | Rate or Concentration  |  |  |  |
|      |  |  |  |  |  |
|      | ·  | <del></del>  |  |  |  |
|      |  | <del></del>  |  |  |  |
|      |  | <del></del>  |  |  |  |
| D.   | Describe the existing control and trea   | tment technology (if any).   |  |  |  |
|      | 1. Control Device/System:  | 2. Operating Principles:   |  |  |  |
|      | 3. Efficiency:*  | 4. Capital Costs:  |  |  |  |
| *Exp | lain method of determining   | ·  |  |  |  |

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|                        |      | •  |               |       |  |         |  |
|------------------------|------|--|---------------|-------|--|---------|--|
|                        | 5.   | Useful Life:   |               | 6.    | Operating Costs:                           |         |  |
|                        | 7.   | Energy:  |               | 8.    | Maintenance Cost:                          |         |  |
|                        | 9.   | Emissions:   |               |       |  |         |  |
|                        |      | Contaminant  | •             |       | Rate or Concentration                      |         |  |
|                        |      |  |               |       |  |         |  |
|                        |      |  |               |       |  |         |  |
|                        |      |  |               |       |  |         |  |
|                        | 10.  | Stack Parameters   |               |       |  |         |  |
|                        | a.   | Height:  | ft.           | b.    | Diameter:                                  | ft.     |  |
|                        | c.   | Flow Rate:   | ACFH          | d.    | Temperature:                               | °F.     |  |
|                        | e.   | Velocity:  | FPS           |       |  |         |  |
| ε.                     |      | cribe the control and treatment additional pages if necessary).    |               | iolog | y <b>availa</b> ble (As many types as appl | icable, |  |
|                        | a.   | Control Device:  |               | ь.    | Operating Principles:                      |         |  |
|                        | c.   | Efficiency: 1  | ,             | d.    | Capital Cost:                              |         |  |
|                        | e.   | Useful Life:   |               | f.    | Operating Cost:                            |         |  |
|                        | g.   | Energy: 2  |               | h.    | Maintenance Cost:                          |         |  |
|                        | i.   | Availability of construction materials and process chemicals:      |               |       |  |         |  |
|                        | j.   | Applicability to manufacturing                                     | brocea        | ses:  |  |         |  |
|                        | k.   | Ability to construct with contrainth proposed levels:              | ol de         | vice  | , install in available space, and o        | operate |  |
|                        | 2.   |  |               |       |  |         |  |
|                        | a.   | Control Device:  |               | ь.    | Operating Principles:                      |         |  |
|                        | c.   | Efficiency: 1  | :             | d. (  | Capital Cost:                              |         |  |
|                        | e.   | Useful Life:   |               | f.    | Operating Cost:                            |         |  |
|                        | g.   | Energy: 2  |               | h.    | Maintenance Cost:                          |         |  |
|                        | i.   | Availability of construction ma                                    | terial        | s an  | d process chemicals:                       |         |  |
| 1 <sub>Ex</sub><br>2En | plai | n method of determining efficience to be reported in units of elec | cy.<br>trical | . рож | er – KWH design rate.                      |         |  |

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Applicability to manufacturing processes: Ability to construct with control device, install in available space, and operate within proposed levels: 3. Control Device: Operating Principles: b. Efficiency: 1 d. Capital Cost: Useful Life: f. Operating Cost: g. Energy: 2 h. Maintenance Cost: Availability of construction materials and process chemicals: Applicability to manufacturing processes: Ability to construct with control device, install in available apace, and operate within proposed levels: 4. Control Device: b. Operating Principles: Efficiency: 1 d. Capital Coats: Useful Life: f. Operating Cost: q. Energy:2 h. Maintenance Cost: i. Availability of construction materials and process chemicals: j. Applicability to manufacturing processes: Ability to construct with control device, install in available space, and operate within proposed levels: Describe the control technology selected: 1. Control Device: 2. Efficiency: 1 3. Capital Cost: Useful Life: 6. Energy: 2 5. Operating Cost: 7. Maintenance Cost: 8. Manufacturer: 9. Other locations where employed on similar processes: a. (1) Company: (2) Mailing Address: (3) City: (4) State: LExplain method of determining efficiency.  $^2$ Energy to be reported in units of electrical power ~ KWH design rate.

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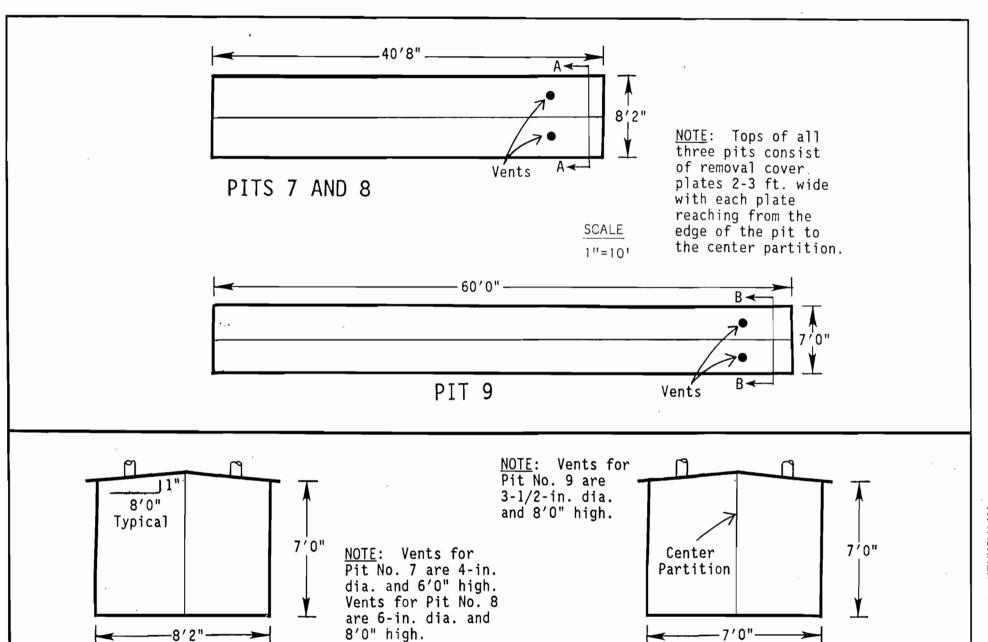
|             | (5) Environmental Manager:                                     |                                   |                          |
|-------------|--|-----------------------------------|--------------------------|
|             | (6) Telephone No.:   |                                   |                          |
|             | (7) Emissions: 1   |                                   |                          |
|             | Contaminant  | . Rate or                         | Concentration            |
|             |  |                                   |                          |
|             | (8) Process Rate: 1  |                                   |                          |
|             | b. (1) Company:  | J                                 |                          |
|             | (2) Mailing Address:   |                                   |                          |
|             | (3) City:  | (4) State:                        |                          |
|             | (5) Environmental Manager:                                     |                                   |                          |
|             | (6) Telephone No.:   |                                   |                          |
|             | (7) Emissions: 1   |                                   | ·                        |
|             | Conteminant  | Rate or                           | Concentration            |
|             |  |                                   |                          |
|             | (8) Process Rate: 1  |                                   |                          |
|             | 10. Reason for selection and                                   | description of mystemm:           |                          |
|             | plicant must provide this inf<br>ailable, applicant must state |                                   | f this information not b |
| Α.          | _  | PREVENTION OF SIGNIFICANT DETERIO | DRATION                  |
|             | 1no. sites   | TSP( ) SO <sup>2</sup> *          | Wind spd/dir             |
|             | Period of Monitoring   | month day year month              |                          |
|             | Other data recorded  |                                   |                          |
|             | Attach all data or statistica                                  | l summaries to this application.  |                          |
| <b>*</b> Sp | ecify bubbler (8) or continuou                                 | s (C).                            |                          |
| DER         | Form 17-1.202(1)   | ,                                 |                          |

|    | <ol><li>Instrumentation,</li></ol>        | , Field and Laboratory  |        |
|----|---|---|--------|
|    | a. Was instrumentat                       | tion EPA referenced or its equivalent? [ ] Yes [ ] No   |        |
|    | <ol> <li>Was instrumentat</li> </ol>      | tion calibrated in accordance with Department procedures?   |        |
|    | [ ] Yes [ ] No                            | [ ] Unknown   |        |
| В. | Meteorological Data                       | Used for Air Quality Modeling   |        |
|    | 1 Year(s) of                              | f data from / / to / / month day year month day year  |        |
|    | 2. Surface data obt                       | ained from (location)   |        |
|    | <ol> <li>Upper air (mixin</li> </ol>      | g height) data obtained from (location)   |        |
|    | 4. Stability wind r                       | ose (STAR) data obtained from (location)  |        |
| c. | Computer Models Used                      |   |        |
|    | 1.  | Modified? If yes, attach descript   | tion.  |
|    | 2   | Modified? If yes, attach descript   | tion.  |
|    | 3.  | Modified? If yes, attach descript   | tion.  |
|    | 4.  | Modified? If yes, attach descript   | tion.  |
|    | Attach copies of all ciple output tables. | final model runs showing input data, receptor locations, and  | prin-  |
| D. | Applicants Maximum A                      | llowable Emission Data  |        |
|    | Pollutant                                 | Emission Rate   |        |
|    | TSP                                       | grams/sec   |        |
|    | so <sup>2</sup>                           | grams/sec   |        |
| ε. | Emission Data Used in                     | n Modeling  |        |
|    |   | ion sources. Emission data required is source name, descripti<br>S point number), UTM coordinates, stack data, allowable emiss<br>time. |        |
| ۴. | Attach all other info                     | ormation supportive to the PSD review.  |        |
| G. | Discuss the social ar                     | nd economic impact of the selected technology versus other app  | olica- |

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.

ble technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

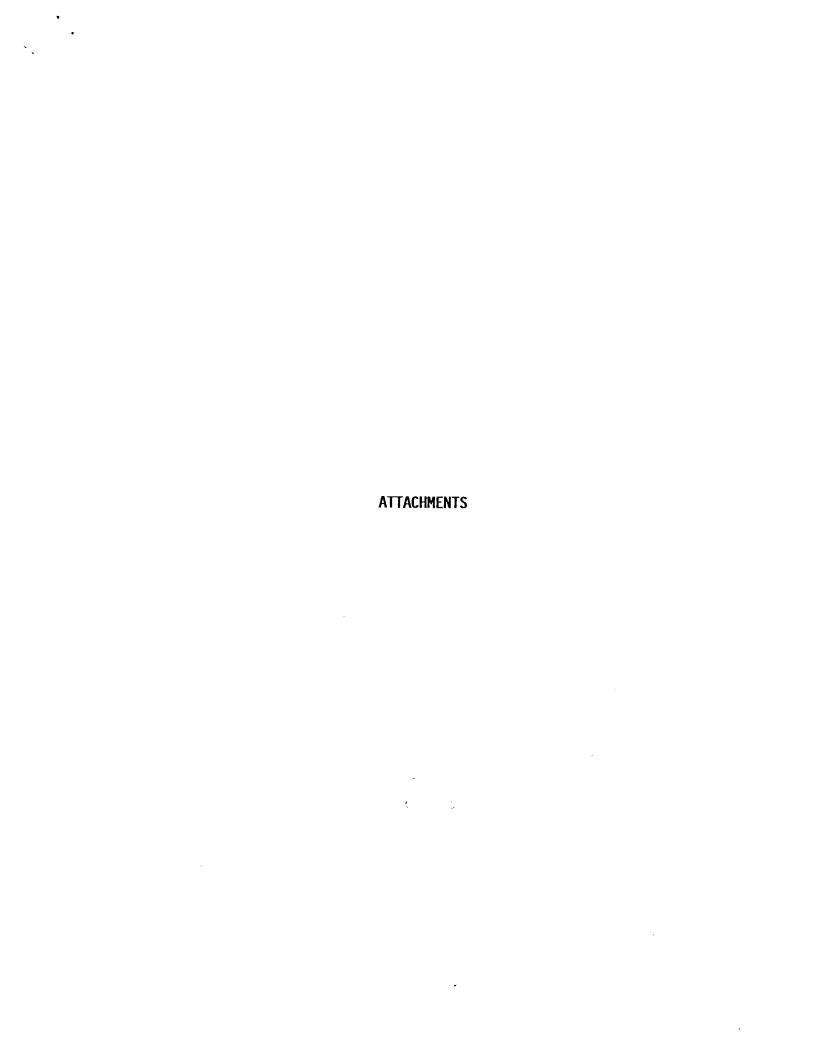


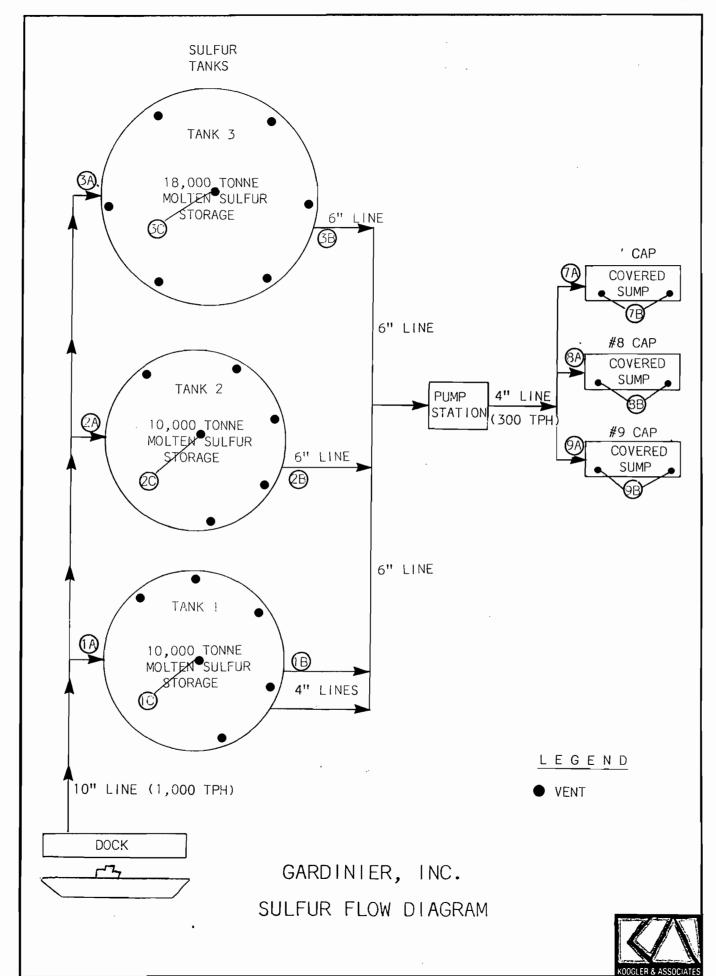


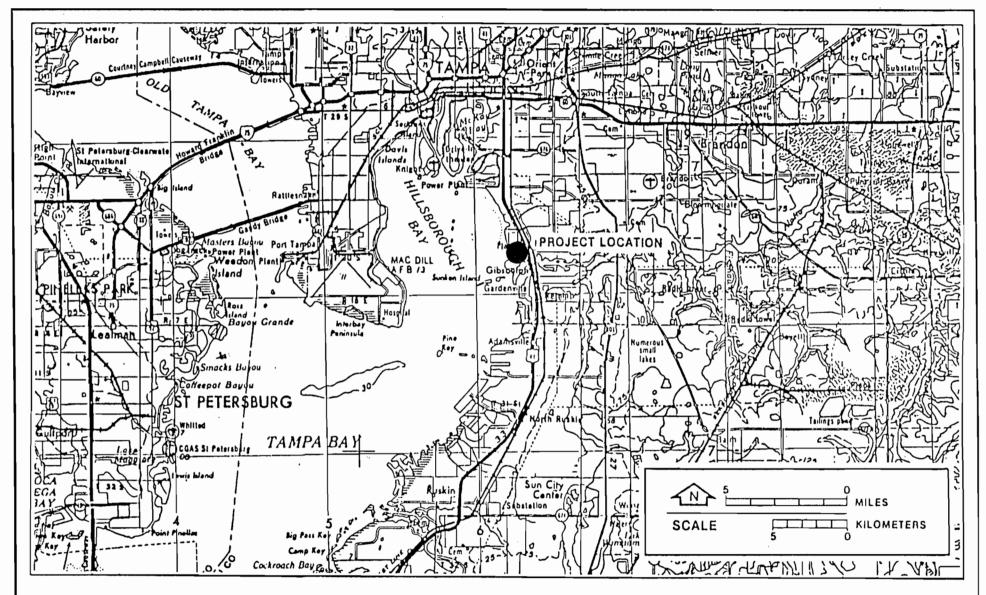
SULFUR PIT DIMENSIONS

Section B-B

Section A-A

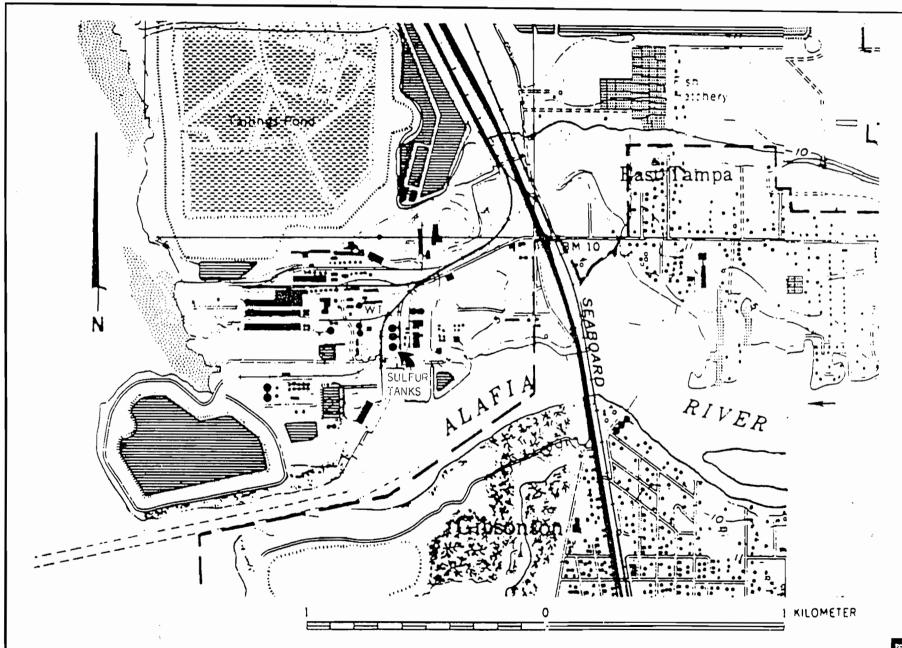






GENERAL LOCATION MAP OF GARDINIER, INC.





SITE LOCATION MAP



