main file

GARDINIER INC.

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

March 13, 1989

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.

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. The 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

VENDOR NUMBER	INVOICE NUMBER	INVOICE DATE	GROSS AMOUNT	DISCOUNT	NET AMOUNT
3351		3 15 89	20000		20000
Permit fee/Air Construction permit for Gardinier, Inc. Molten Sulfur System (P-15)				103	
TOTAL			20000		20000

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

GARDINIER, INC. TAMPA, FLORIDA 0335

NO. 577028369

64-1278
611

DATE MO. DAY YR.			DOLLARS	CENTS
3/16/89	PAY EXACTLY ********200 DOLLARS AND 00 CENTS	$	********200	.00

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

GARDINIER, INC.

Tom Blanck

AUTHORIZED SIGNATURE

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

⑈577028369⑈ ⑆061112788⑆ 011 07 093⑈

#200pd
3-20-89
Recpt. 117605

AC 29-162375

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

RECEIVED

MAR 20 1989

DER-BAQM

APPLICATION TO ~~OPERATE~~/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Molten Sulfur System [ ] New[1] [X] Existing[1]

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

COMPANY NAME: Gardinier, Inc. COUNTY: Hillsborough

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) _____

SOURCE LOCATION: Street U. S. 41 City Gibsonton

UTM: East (17) 363.0 km North 3082.3 km

Latitude 27 ° 51 ' 36 "N Longitude 82 ° 23 ' 29 "W

APPLICANT NAME AND TITLE: E. O. Morris, Environmental Manager

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

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Gardinier, Inc.

I certify that the statements made in this application for a construction permit are true, correct and complete to the best of my knowledge and belief. Further, I agree to maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provision of Chapter 403, Florida Statutes, and all the rules and regulations of the department and revisions thereof. I also understand that a permit, if granted by the department, will be non-transferable and I will promptly notify the department upon sale or legal transfer of the permitted establishment.

*Attach letter of authorization

Signed: E. O. Morris

E. O. Morris, Environmental Manager
Name and Title (Please Type)

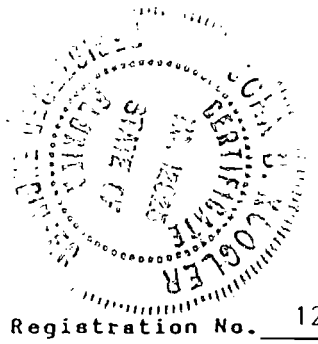
Date: 3/14/89 Telephone No. (813) 677-9111

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

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

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

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.



Signed _____

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
Mailing Address (Please Type)

Florida Registration No. 12925 Date: 3/9/89 Telephone No. (904) 377-5822

SECTION II: GENERAL PROJECT INFORMATION

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

See individual information packages.

B. 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.

No modifications are required for sulfur pits.

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

None

TANK NO. 1

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

INFORMATION FOR TANK NO. 1

SOURCE TYPE: Molten Sulfur Storage Tank [ ] New[1] [X] Existing[1]

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

COMPANY NAME: Gardinier, Inc. COUNTY: Hillsborough

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) 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 Longitude 82 ° 23 ' 29 "W

APPLICANT NAME AND TITLE: E. O. Morris, Environmental Manager

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

SECTION II: GENERAL PROJECT INFORMATION

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

See page 2a of 12.

B. 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. 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.

E. Requested permitted equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 52 ;

if power plant, hrs/yr _____; if seasonal, describe: _____

F. If this is a new source or major modification, answer the following questions. (Yes or No) Existing minor source

1. 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" (NESHAP) apply to this source? NA

H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source? NO

   a. If yes, for what pollutants? _____

   b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted.

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

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

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

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		
Molten Sulfur	None	-	2,200,000*	1A
*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 Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
Part. Matter							
(1)	1.44	0.29	-	-	1.44	0.29	1C
(2)	0.08	0.31	-	-	0.08	0.31	1C
Total	-	0.60	17-2.600(11)(e)2	<1.0 tpy	-	0.60	1C

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

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

[3]Calculated from operating rate and applicable standard.

[4]Emission, if source operated without control (See Section V, Item 3).

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

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
NONE				

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
NONE			

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis:

Percent Sulfur: _____ Percent Ash: _____

Density: _____ lbs/gal Typical Percent Nitrogen: _____

Heat Capacity: _____ BTU/lb _____ BTU/gal

Other Fuel Contaminants (which may cause air pollution): _____

_____

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

Annual Average 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.

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

Stack Height: 32 ft @ 18000 tonne capacity / 24 ft @ 10000 tonne capacity ft. 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 of Waste	Type 0 (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Incinerated							
Uncontrolled (lbs/hr)							

Description of Waste _____

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

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

Manufacturer _____

Date Conatructed _____ Model No. _____

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

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

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

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

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

[ ] Other (specify) _____

Brief description of operating characteristics of control devices: _____

_____

_____

_____

_____

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

_____

_____

_____

_____

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

SECTION V: SUPPLEMENTAL REQUIREMENTS

(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 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.

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

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 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

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 Environmental Regulation.

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

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

(NOT APPLICABLE)

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

[ ] Yes [ ] No

Contaminant	Rate or Concentration

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

[ ] Yes [ ] No

Contaminant	Rate or Concentration

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

Contaminant	Rate or Concentration

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

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:

*Explain method of determining

5. Useful Life:

6. Operating Costs:

7. Energy:

8. Maintenance Cost:

9. Emissions:

Contaminant	Rate or Concentration

10. Stack Parameters

a. Height: ft.

b. Diameter: ft.

c. Flow Rate: ACFM

d. Temperature: °F.

e. Velocity: FPS

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary).

1.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

2.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Costs:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected:

1. Control Device:

2. Efficiency:[1]

3. Capital Cost:

4. Useful Life:

5. Operating Cost:

6. Energy:[2]

7. Maintenance Cost:

8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

[1]Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

(NOT APPLICABLE)

A. Company Monitored Data

1. _____no. sites _____ TSP _____( ) SO^2* _____ Wind spd/dir

Period of Monitoring _____/_____/_____ to _____/_____/_____
month day year month day year

Other data recorded _____

Attach all data or statistical summaries to this application.

*Specify bubbler (B) or continuous (C).

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? [ ] Yes [ ] No

b. Was instrumentation calibrated in accordance with Department procedures?

[ ] Yes [ ] No [ ] Unknown

B. Meteorological Data Used for Air Quality Modeling

1. _____ Year(s) of data from _____/_____/_____ to _____/_____/_____
month day year month day year

2. Surface data obtained from (location)_____

3. Upper air (mixing height) data obtained from (location)_____

4. Stability wind rose (STAR) data obtained from (location)_____

C. Computer Models Used

1. _____ Modified? If yes, attach description.

2. _____ Modified? If yes, attach description.

3. _____ Modified? If yes, attach description.

4. _____ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate	
TSP	_____	grams/sec
SO^2	_____	grams/sec

E. Emission Data Used in Modeling

Attach list of emission sources. Emission data required is source name, description of point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review.

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

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

TANK NO. 2

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

INFORMATION FOR TANK NO. 2

SOURCE TYPE: Molten Sulfur Storage Tank [ ] New[1] [X] Existing[1]

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

COMPANY NAME: Gardinier, Inc. COUNTY: Hillsborough

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) Tank No. 2

SOURCE LOCATION: Street U. S. 41 City Gibsonton

UTM: East (17) 363.0 km North 3082.3 km

Latitude 27 ° 51 ' 36 "N Longitude 82 ° 23 ' 29 "W

APPLICANT NAME AND TITLE: E. O. Morris, Environmental Manager

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

SECTION II: GENERAL PROJECT INFORMATION

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

See page 2a of 12.

B. 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.

E. Requested permitted equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 52 ;

if power plant, hrs/yr_____; if seasonal, describe:_____

F. If this is a new source or major modification, answer the following questions. (Yes or No) Existing minor source

1. 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" (NESHAP) apply to this source? NA

H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source? NO

   a. If yes, for what pollutants?_____

   b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted.

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

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

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

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		
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 sheets as necessary)

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
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 tpy	-	0.60	2C

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

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

[3] Calculated from operating rate and applicable standard.

[4] Emission, if source operated without control (See Section V, Item 3).

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

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
NONE				

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
NONE			

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis:

Percent Sulfur: _____ Percent Ash: _____

Density: _____ lbs/gal Typical Percent Nitrogen: _____

Heat Capacity: _____ BTU/lb _____ BTU/gal

Other Fuel Contaminants (which may cause air pollution): _____

_____

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

Annual Average 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.

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

Stack Height: 32 ft @ 18000 tonne capacity / 25 ft @ 10000 tonne capacity ft. 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 of Waste	Type 0 (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Incinerated							
Uncontrolled (lbs/hr)							

Description of Waste _____

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

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

Manufacturer _____

Date Constructed _____ Model No. _____

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

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

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

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

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

[ ] Other (specify) _____

Brief description of operating characteristics of control devices: _____

_____

_____

_____

_____

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

_____

_____

_____

_____

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

SECTION V: SUPPLEMENTAL REQUIREMENTS

(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 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.

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 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 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

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 Environmental Regulation.

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

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

(NOT APPLICABLE)

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

[ ] Yes [ ] No

Contaminant	Rate or Concentration

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

[ ] Yes [ ] No

Contaminant	Rate or Concentration

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

Contaminant	Rate or Concentration

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

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:

*Explain method of determining

5. Useful Life:

6. Operating Costs:

7. Energy:

8. Maintenance Cost:

9. Emissions:

Contaminant	Rate or Concentration

10. Stack Parameters

a. Height: ft.

b. Diameter: ft.

c. Flow Rate: ACFM

d. Temperature: °F.

e. Velocity: FPS

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary).

1.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

2.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Costs:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected:

1. Control Device:

2. Efficiency:[1]

3. Capital Cost:

4. Useful Life:

5. Operating Cost:

6. Energy:[2]

7. Maintenance Cost:

8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

[1]Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

(NOT APPLICABLE)

A. Company Monitored Data

1. _____no. sites _____ TSP, _____( ) SO^2* _____ Wind spd/dir

Period of Monitoring _____/_____/_____ to _____/_____/_____
month day year month day year

Other data recorded _____

Attach all data or statistical summaries to this application.

*Specify bubbler (B) or continuous (C).

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? [ ] Yes [ ] No

b. Was instrumentation calibrated in accordance with Department procedures?

[ ] Yes [ ] No [ ] Unknown

B. Meteorological Data Used for Air Quality Modeling

1. _____ Year(s) of data from _____/_____/_____ to _____/_____/_____
month day year month day year

2. Surface data obtained from (location)_____

3. Upper air (mixing height) data obtained from (location)_____

4. Stability wind rose (STAR) data obtained from (location)_____

C. Computer Models Used

1. _____ Modified? If yes, attach description.

2. _____ Modified? If yes, attach description.

3. _____ Modified? If yes, attach description.

4. _____ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate	
TSP	_____	grams/sec
SO^2	_____	grams/sec

E. Emission Data Used in Modeling

Attach list of emission sources. Emission data required is source name, description of point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review.

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

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

TANK NO. 3

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

INFORMATION FOR TANK NO. 3

SOURCE TYPE: Molten Sulfur Storage Tank [ ] New[1] [X] Existing[1]

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

COMPANY NAME: Gardinier, Inc. **COUNTY:** Hillsborough

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) Tank No. 3

SOURCE LOCATION: Street U. S. 41 **City** Gibsonton

UTM: East (17) 363.0 km **North** 3082.3 km

Latitude 27 ° 51 ' 36 "N **Longitude** 82 ° 23 ' 29 "W

APPLICANT NAME AND TITLE: E. O. Morris, Environmental Manager

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

SECTION II: GENERAL PROJECT INFORMATION

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

See page 2a of 12.

B. 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. 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.

E. Requested permitted equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 52 ;

if power plant, hrs/yr_____; if seasonal, describe:_____

F. If this is a new source or major modification, answer the following questions. (Yes or No) Existing minor source

1. 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" (NESHAP) apply to this source? NA

H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source? NO

   a. If yes, for what pollutants?_____

   b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted.

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

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

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

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		
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 Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
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 tpy	-	0.60	3C

(1) Sulfur pumped to tank at 1000 tonnes/hr; (2) Tank sitting idle or with sulfur being withdrawn

[1] See Section V, Item 2.

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

[3] Calculated from operating rate and applicable standard.

[4] Emission, if source operated without control (See Section V, Item 3).

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

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
NONE				

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
NONE			

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis:

Percent Sulfur: _____ Percent Ash: _____

Density: _____ lbs/gal Typical Percent Nitrogen: _____

Heat Capacity: _____ BTU/lb _____ BTU/gal

Other Fuel Contaminants (which may cause air pollution): _____

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

Annual Average NA Maximum _____

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

NONE

Air flow with no tank activity or during sulfur withdrawal/during tank filling.

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

Stack Height: 32 ft. 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 of Waste	Type 0 (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Incinerated							
Uncontrolled (lbs/hr)							

Description of Waste _____

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

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

Manufacturer_____

Date Constructed _____ Model No. _____

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

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

Gas Flow Rate: _____ACFM _____ DSCFM* Velocity: _____FPS

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

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

[ ] Other (specify)_____

Brief description of operating characteristics of control devices: _____

_____

_____

_____

_____

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

_____

_____

_____

_____

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

SECTION V: SUPPLEMENTAL REQUIREMENTS

(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 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.

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

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 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

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 Environmental Regulation.

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

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

(NOT APPLICABLE)

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

[ ] Yes [ ] No

Contaminant	Rate or Concentration

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

[ ] Yes [ ] No

Contaminant	Rate or Concentration

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

Contaminant	Rate or Concentration

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

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:

*Explain method of determining

5. Useful Life:

6. Operating Costs:

7. Energy:

8. Maintenance Cost:

9. Emissions:

Contaminant	Rate or Concentration

10. Stack Parameters

a. Height: ft.

b. Diameter: ft.

c. Flow Rate: ACFM

d. Temperature: °F.

e. Velocity: FPS

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary).

1.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

2.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Costs:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected:

1. Control Device:

2. Efficiency:[1]

3. Capital Cost:

4. Useful Life:

5. Operating Cost:

6. Energy:[2]

7. Maintenance Cost:

8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

[1]Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

(NOT APPLICABLE)

A. Company Monitored Data

1. _____no. sites _____ TSP, _____( ) SO^2* _____ Wind spd/dir

Period of Monitoring ____/____/____ to ____/____/____
month day year month day year

Other data recorded _____

Attach all data or statistical summaries to this application.

*Specify bubbler (B) or continuous (C).

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? [ ] Yes [ ] No

b. Was instrumentation calibrated in accordance with Department procedures?

[ ] Yes [ ] No [ ] Unknown

B. Meteorological Data Used for Air Quality Modeling

1. _____ Year(s) of data from ____/____/____ to ____/____/____
month day year month day year

2. Surface data obtained from (location)_____

3. Upper air (mixing height) data obtained from (location)_____

4. Stability wind rose (STAR) data obtained from (location)_____

C. Computer Models Used

1. _____ Modified? If yes, attach description.

2. _____ Modified? If yes, attach description.

3. _____ Modified? If yes, attach description.

4. _____ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate	
TSP	_____	grams/sec
SO^2	_____	grams/sec

E. Emission Data Used in Modeling

Attach list of emission sources. Emission data required is source name, description of point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review.

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

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

SULFUR PITS

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

INFORMATION FOR SULFUR PITS

SOURCE TYPE: Molten Sulfur Pits [ ] New[1] [X] Existing[1]

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

COMPANY NAME: Gardinier, Inc. **COUNTY:** Hillsborough

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) 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 27 ° 51 ' 36 "N **Longitude** 82 ° 23 ' 29 "W

APPLICANT NAME AND TITLE: E. O. Morris, Environmental Manager

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

SECTION II: GENERAL PROJECT INFORMATION

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

See page 2a of 12.

B. 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.)

No Cost.

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

Pit	Capacity
7	115 tonnes
8	115 tonnes
9	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.

E. Requested permitted equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 52 ;

if power plant, hrs/yr_____; if seasonal, describe:_____

F. If this is a new source or major modification, answer the following questions. (Yes or No) Existing minor source

1. 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" (NESHAP) apply to this source? NA

H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source? NO

   a. If yes, for what pollutants?_____

   b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted.

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

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

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

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		
Molten Sulfur	None	-	660,000*	7A, 8A, 9A
*Sulfur transfer rate to pits.				

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

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

2. Product Weight (lbs/hr): NA

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

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
Part. Matter							
Filling	0.44	0.29	-	-	0.44	0.29	7B, 8B, 9B
Wind	0.01	0.05	-	-	0.01	0.05	7B, 8B, 9B
Total	-	0.34	17-2.600(11)(e)2 < 1.0 tpy		-	0.34	-

[1]See Section V, Item 2.

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

[3]Calculated from operating rate and applicable standard.

[4]Emission, if source operated without control (See Section V, Item 3).

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

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
NONE				

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
NONE			

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis:

Percent Sulfur: _____ Percent Ash: _____

Density: _____ lbs/gal Typical Percent Nitrogen: _____

Heat Capacity: _____ BTU/lb _____ BTU/gal

Other Fuel Contaminants (which may cause air pollution): _____

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

Annual Average NA Maximum _____

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

NONE

Pit 7/8/9

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

Stack Height: 6/8/8 ft. Stack Diameter: 3.5/4/6 - in. **.

Gas Flow Rate: 135*/7** ACFM 100*/5** DSCFM Gas Exit Temperature: 240 °F.

Water Vapor Content: 2 % Velocity: 34*-2**/26-1/11-0.6 FPS

*Filling pit
**Wind induced

SECTION IV: INCINERATOR INFORMATION

(NOT APPLICABLE)

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

Description of Waste _____

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

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

Manufacturer _____

Date Constructed _____ Model No. _____

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

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

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

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

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

[ ] Other (specify) _____

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.

<u>Pit Filling</u>

Controlled and uncontrolled emissions are identical

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

$t = 400{,}000 \text{ tpy} / 300 \text{ tph}$
$= 1333 \text{ hr/yr}$

Emissions = 100 cfm x 60 min/hr
x 0.51 gr/dscf 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 cfm x 60 min/hr x 0.29 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 lb/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 characteristics of control devices: _____

_____

_____

_____

_____

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

_____

_____

_____

_____

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

SECTION V: SUPPLEMENTAL REQUIREMENTS

SEE PAGE 7a-b 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 sketch, design preasure drop, etc.)

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

6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.

7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).

8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

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

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

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

(NOT APPLICABLE)

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

[ ] Yes [ ] No

Contaminant	Rate or Concentration

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

[ ] Yes [ ] No

Contaminant	Rate or Concentration

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

Contaminant	Rate or Concentration

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

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:

*Explain method of determining

5. Useful Life:

6. Operating Costs:

7. Energy:

8. Maintenance Cost:

9. Emissions:

Contaminant	Rate or Concentration

10. Stack Parameters

a. Height: ft.

b. Diameter: ft.

c. Flow Rate: ACFM

d. Temperature: °F.

e. Velocity: FPS

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary).

1.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

2.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Costs:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected:

1. Control Device:

2. Efficiency:[1]

3. Capital Cost:

4. Useful Life:

5. Operating Cost:

6. Energy:[2]

7. Maintenance Cost:

8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

[1]Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

(NOT APPLICABLE)

A. Company Monitored Data

1. _____ no. sites _____ TSP _____ ( ) SO^{2}* _____ Wind spd/dir

Period of Monitoring _____/_____/_____ to _____/_____/_____
month day year month day year

Other data recorded _____

Attach all data or statistical summaries to this application.

*Specify bubbler (B) or continuous (C).

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? [ ] Yes [ ] No

b. Was instrumentation calibrated in accordance with Department procedures?

[ ] Yes [ ] No [ ] Unknown

B. Meteorological Data Used for Air Quality Modeling

1. _____ Year(s) of data from _____/_____/_____ to _____/_____/_____
month day year month day year

2. Surface data obtained from (location)_____

3. Upper air (mixing height) data obtained from (location)_____

4. Stability wind rose (STAR) data obtained from (location)_____

C. Computer Models Used

1. _____ Modified? If yes, attach description.

2. _____ Modified? If yes, attach description.

3. _____ Modified? If yes, attach description.

4. _____ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate	
TSP	_____	grams/sec
SO^2	_____	grams/sec

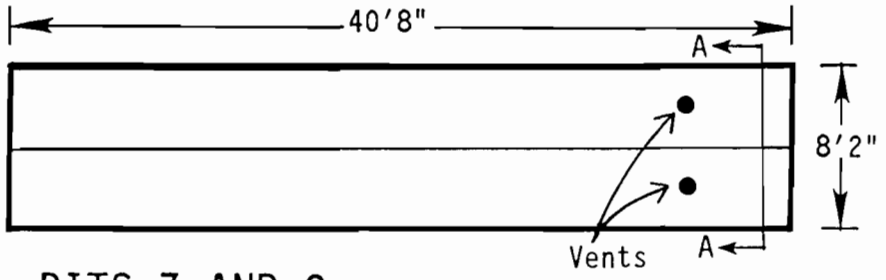
E. Emission Data Used in Modeling

Attach list of emission sources. Emission data required is source name, description of point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review.

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

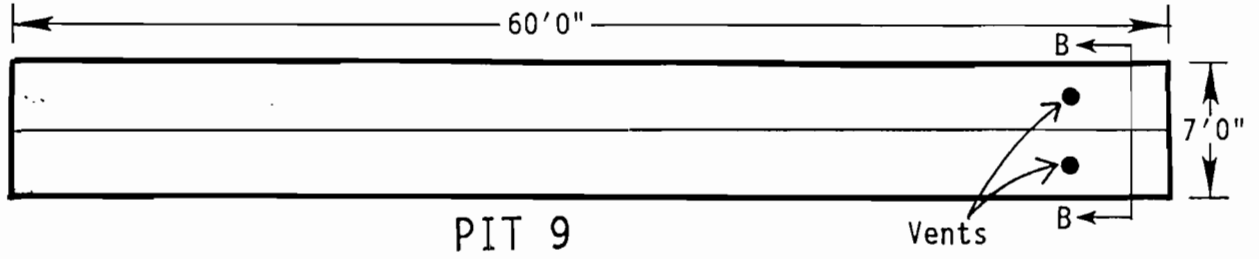
H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.



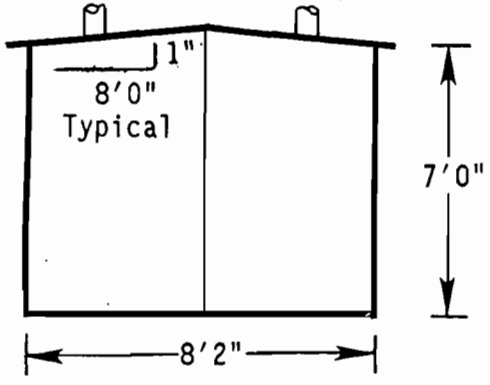
PITS 7 AND 8

SCALE
1"=10'

NOTE: Tops of all three pits consist of removal cover plates 2-3 ft. wide with each plate reaching from the edge of the pit to the center partition.



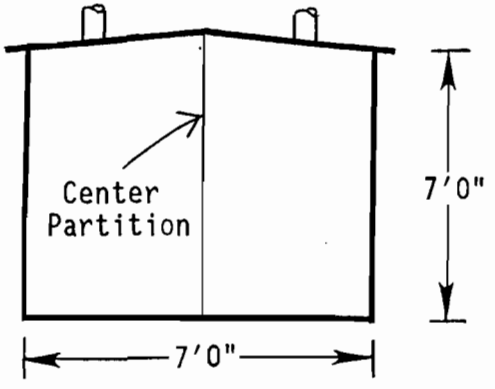
PIT 9



Section A-A

NOTE: Vents for Pit No. 7 are 4-in. dia. and 6'0" high. Vents for Pit No. 8 are 6-in. dia. and 8'0" high.

NOTE: Vents for Pit No. 9 are 3-1/2-in. dia. and 8'0" high.



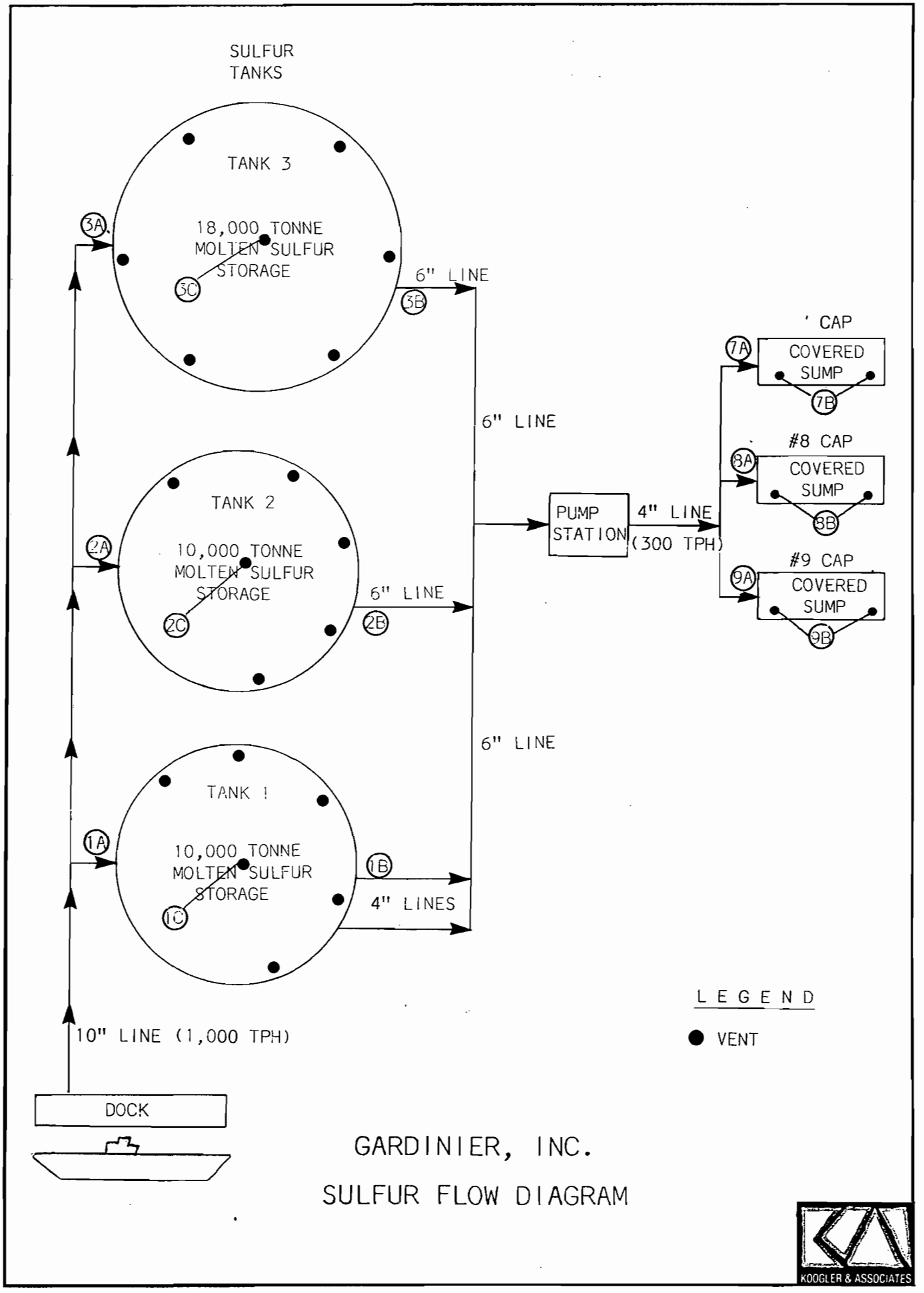
Section B-B

SULFUR PIT DIMENSIONS

ATTACHMENT A

KOOGLER & ASSOCIATES

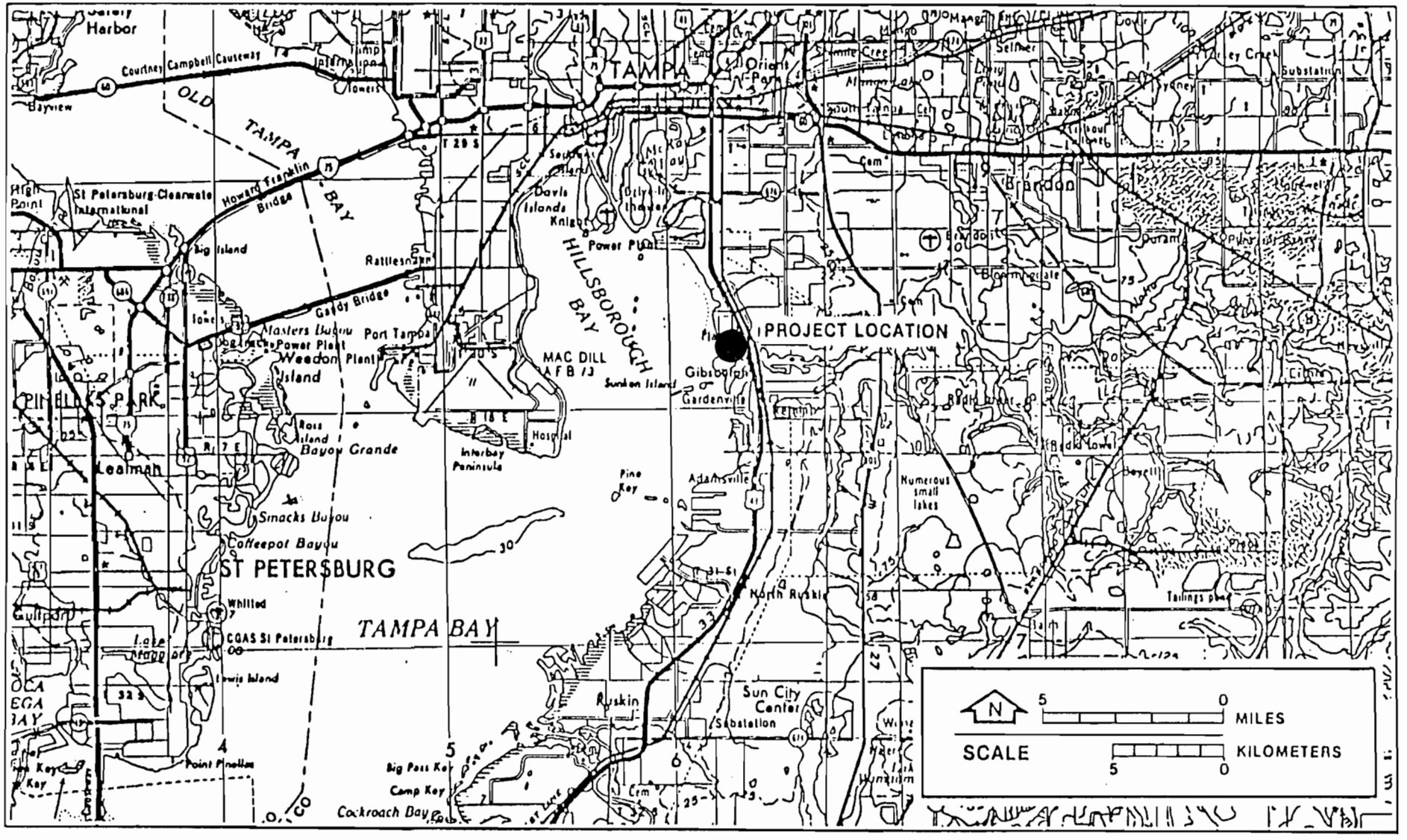
ATTACHMENTS



GARDINIER, INC.

SULFUR FLOW DIAGRAM

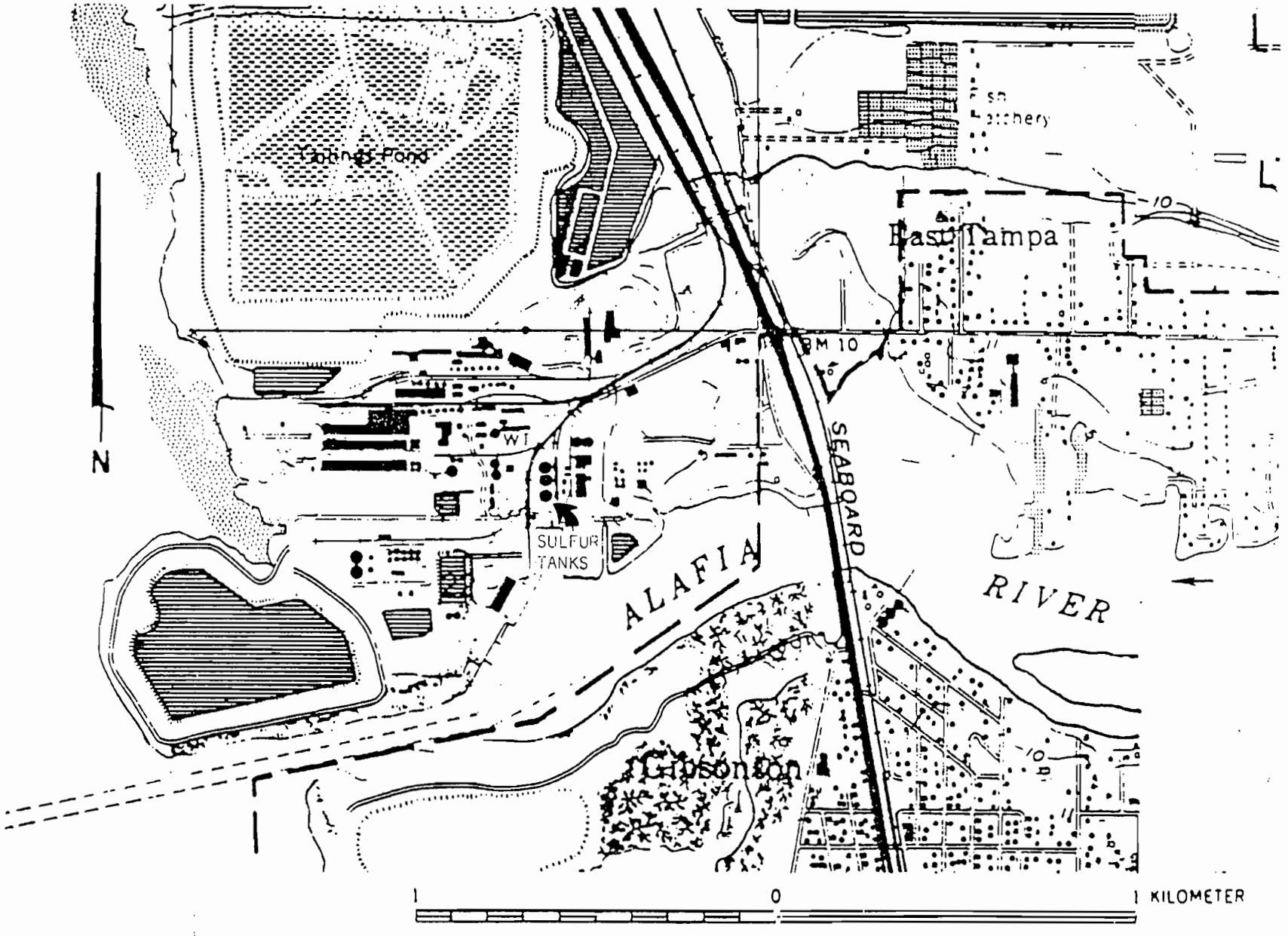
KOOGLER & ASSOCIATES



GENERAL LOCATION MAP OF GARDINIER, INC.

ATTACHMENT 2

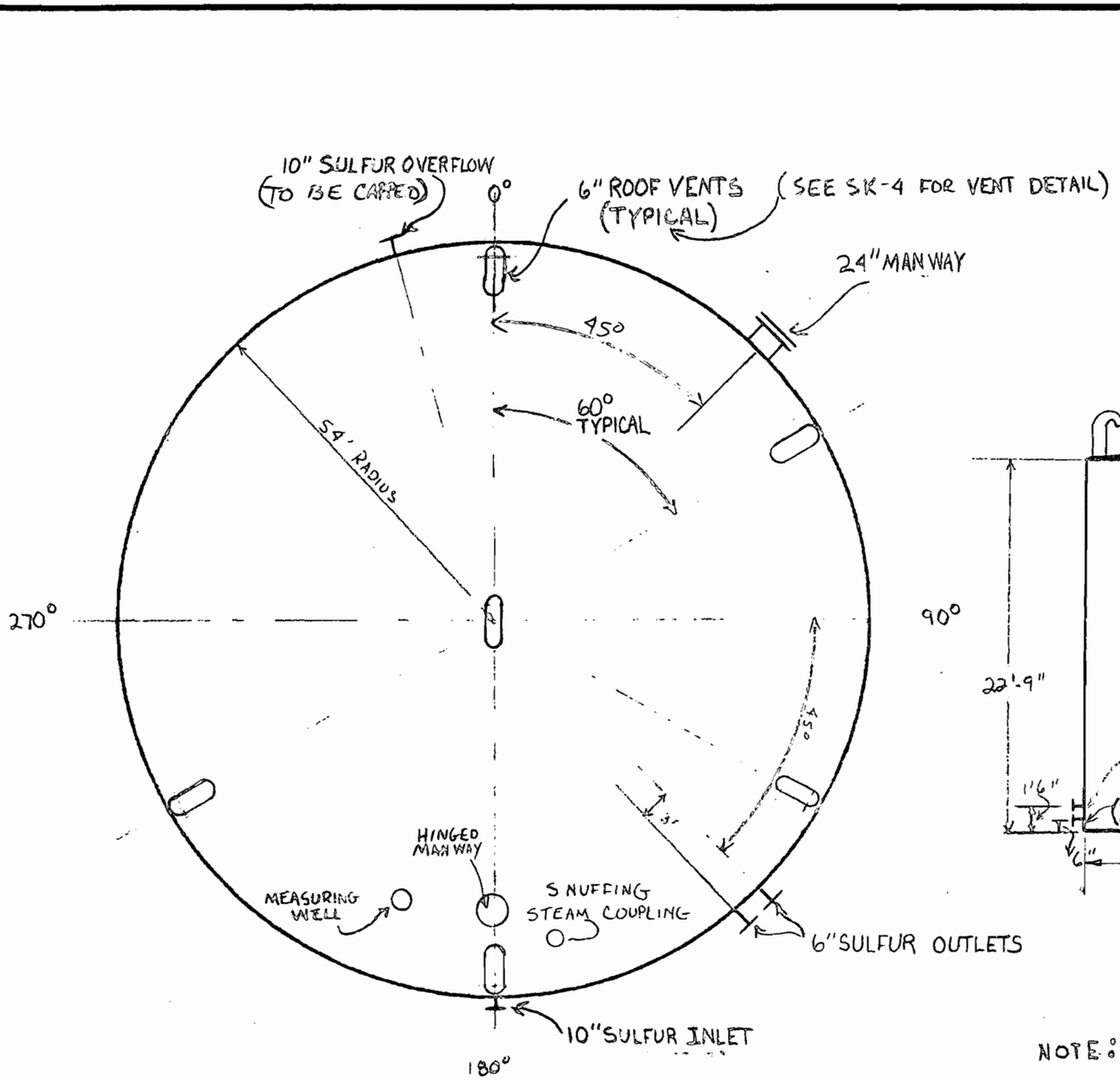
KOOGLER & ASSOCIATES



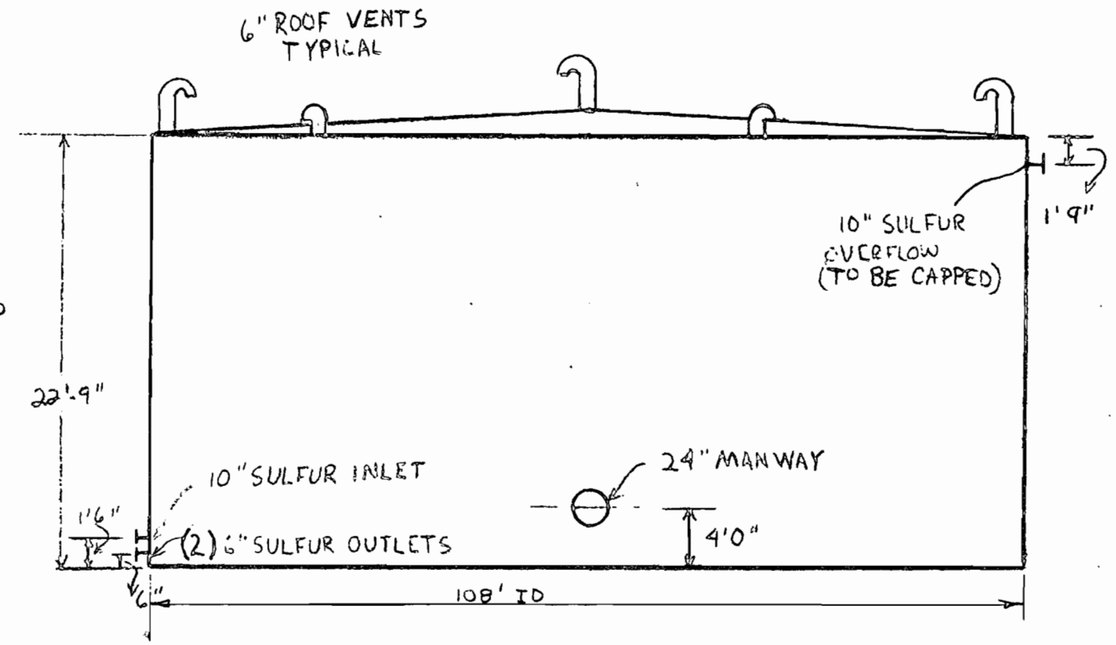
SITE LOCATION MAP

ATTACHMENT 3

KOOGLER & ASSOCIATES



PLAN - NOZZLE ORIENTATION



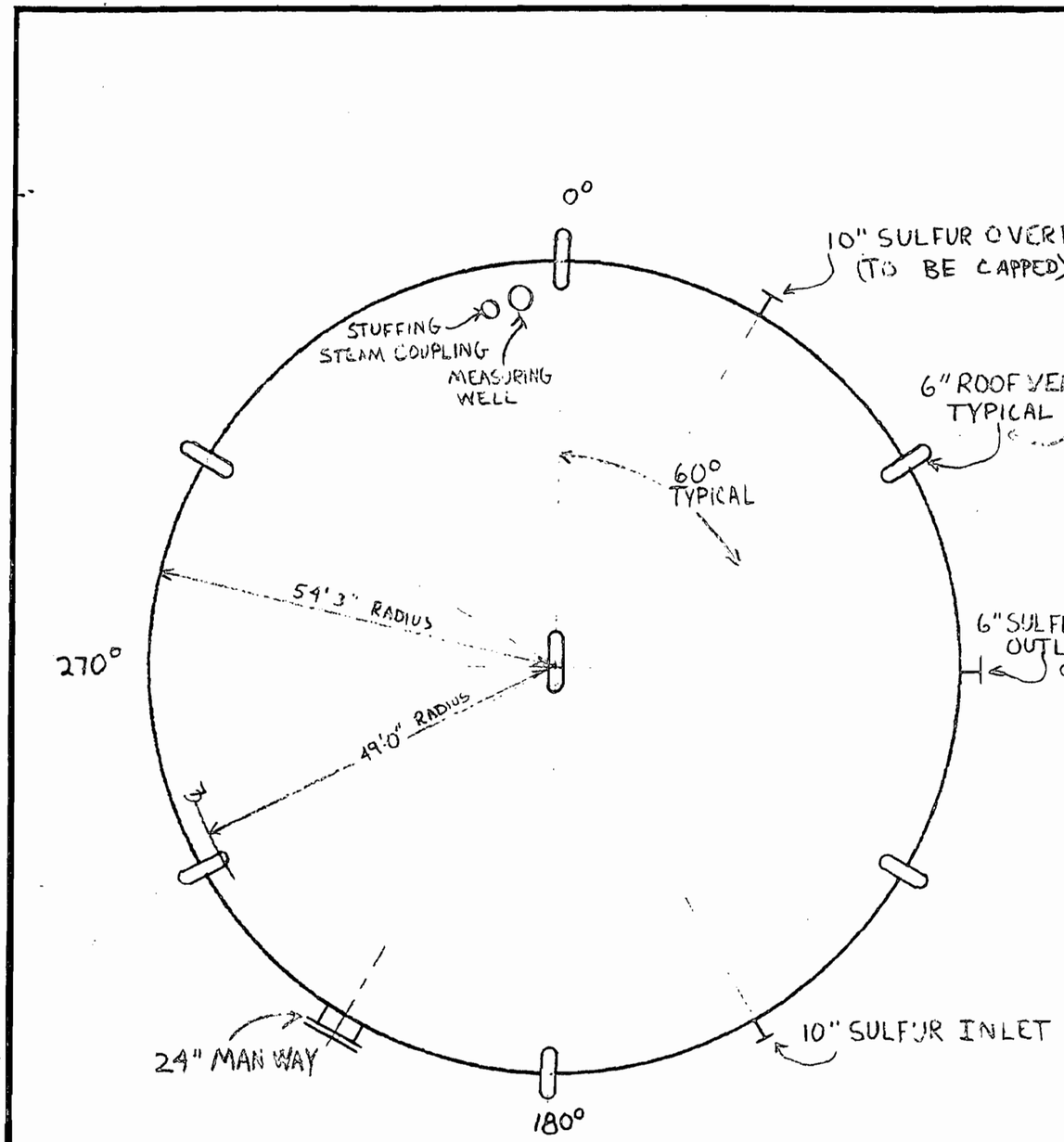
ELEVATION

NOTE: ONLY 5 OUTSIDE VENTS

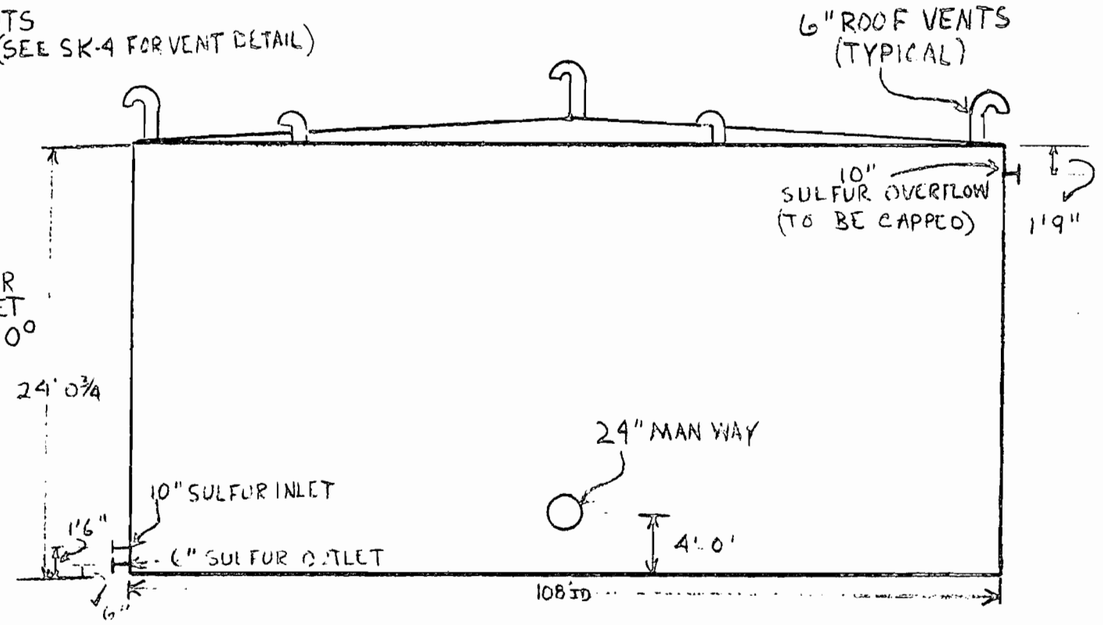
GARDINIER INC.
U. S. PHOSPHORIC PRODUCTS
EAST TAMPA, FLORIDA

MOLTEN SULFUR TANK NO. 1

SECT:	SCALE: NONE	DATE: 2-3-89
DR. KRG		DRAWING NO. SK-1
TR.		
CH.		

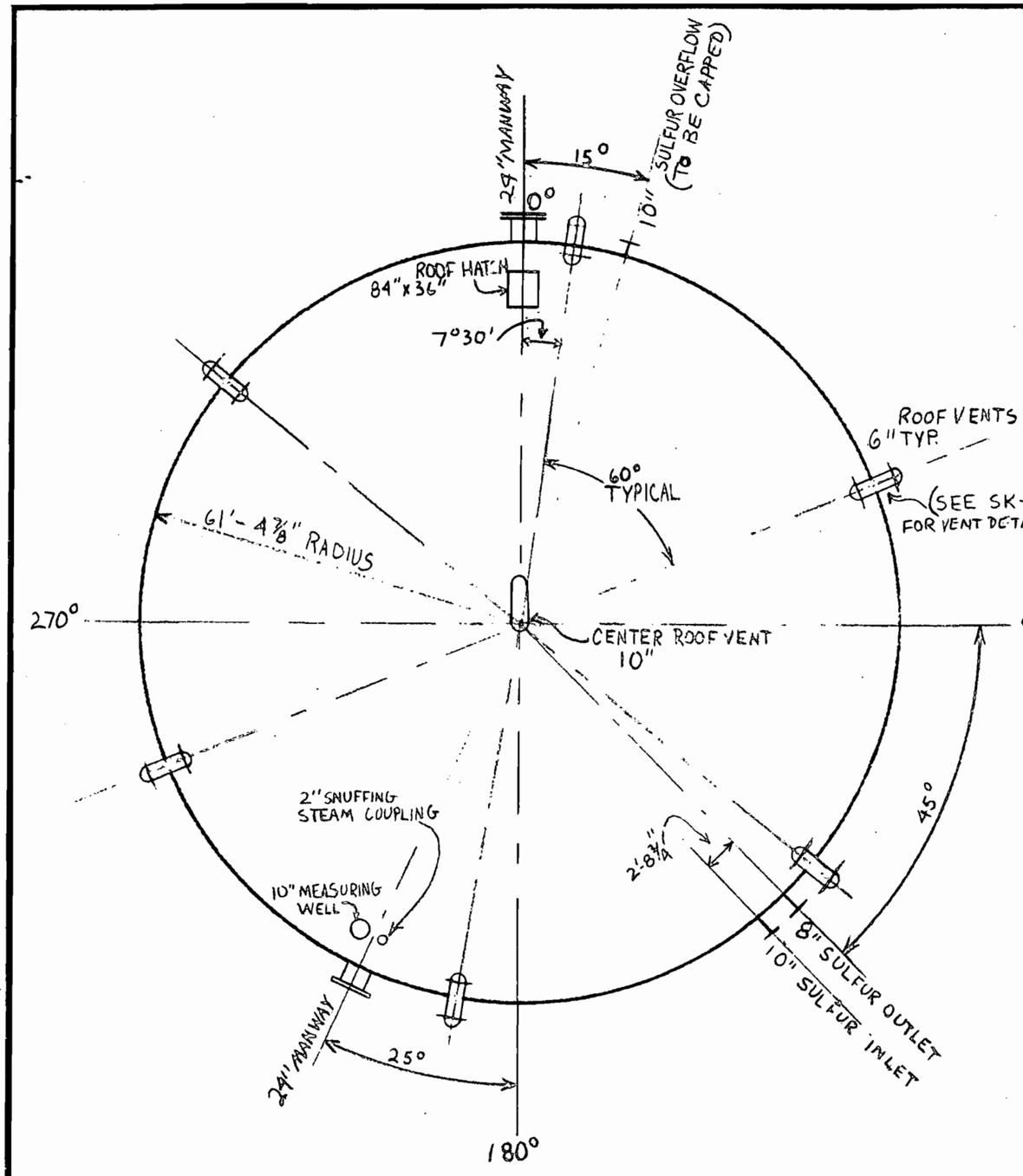


PLAN - NOZZLE ORIENTATION

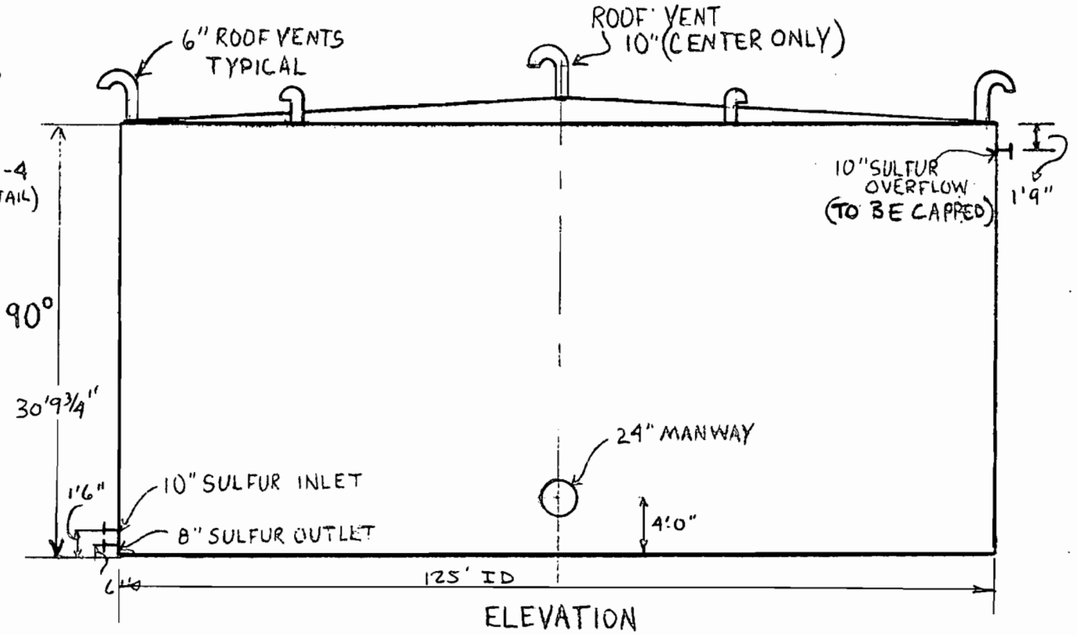


ELEVATION

GARDINIER INC. U. S. PHOSPHORIC PRODUCTS EAST TAMPA. FLORIDA		
MOLTEN SULFUR TANK NO. 2		
SECT:	SCALE: NONE	DATE:
DR. K.R.G. TR. CH.		DRAWING NO. SK-2



PLAN - NOZZLE ORIENTATION

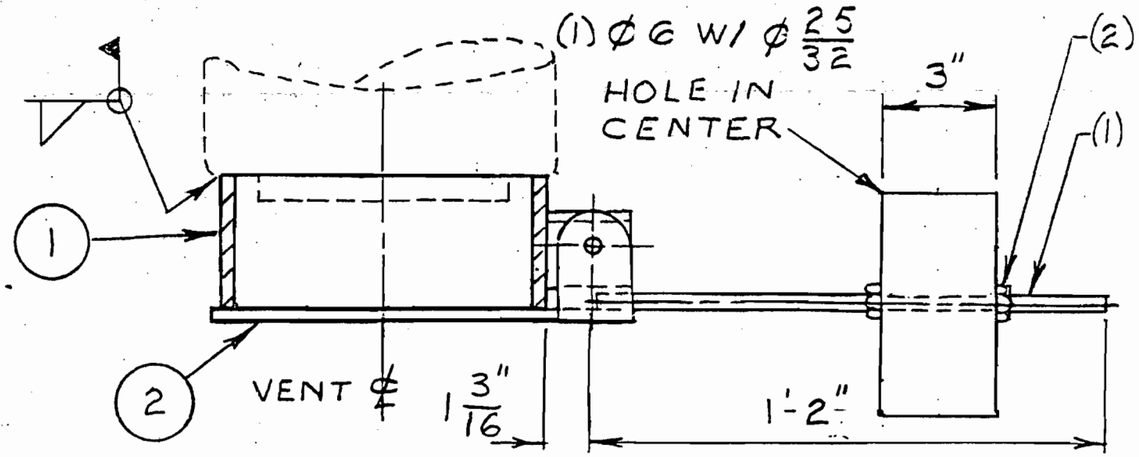


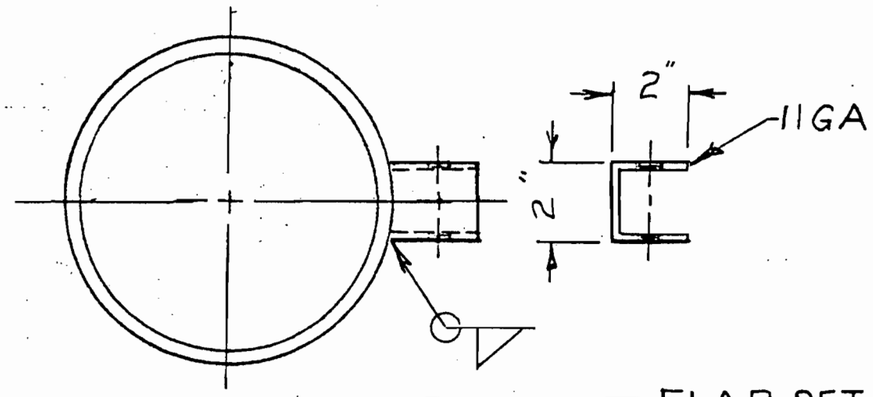
ELEVATION

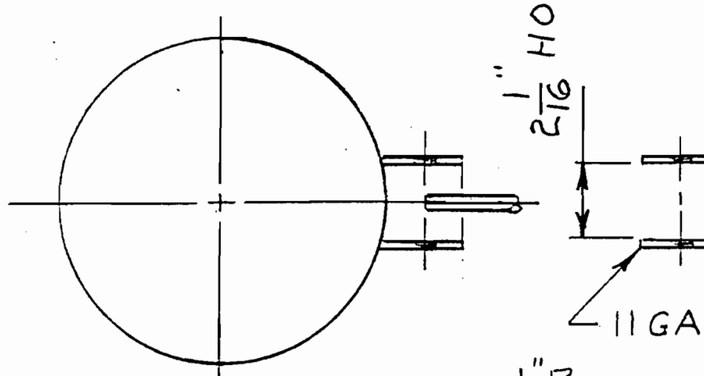
GARDINIER INC.
U. S. PHOSPHORIC PRODUCTS
EAST TAMPA. FLORIDA

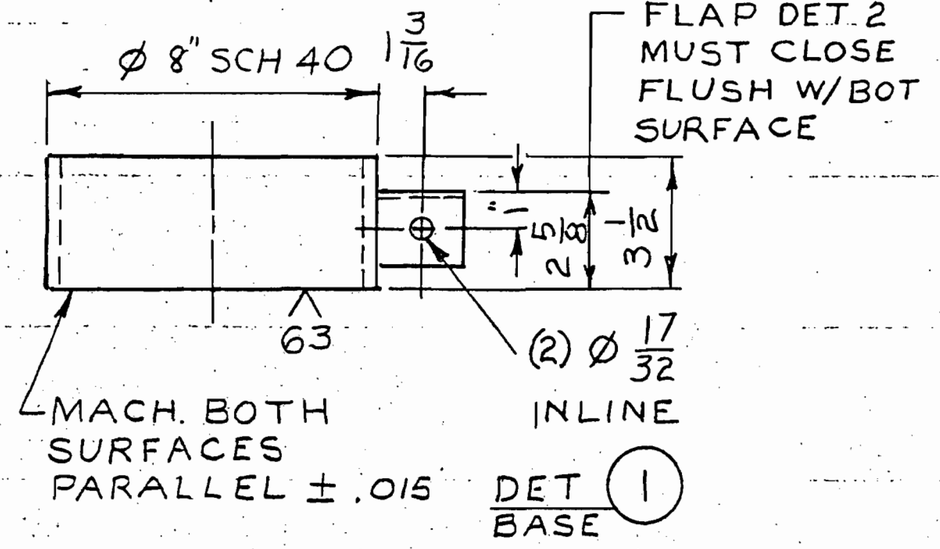
MOLTEN SULFUR TANK NO. 3

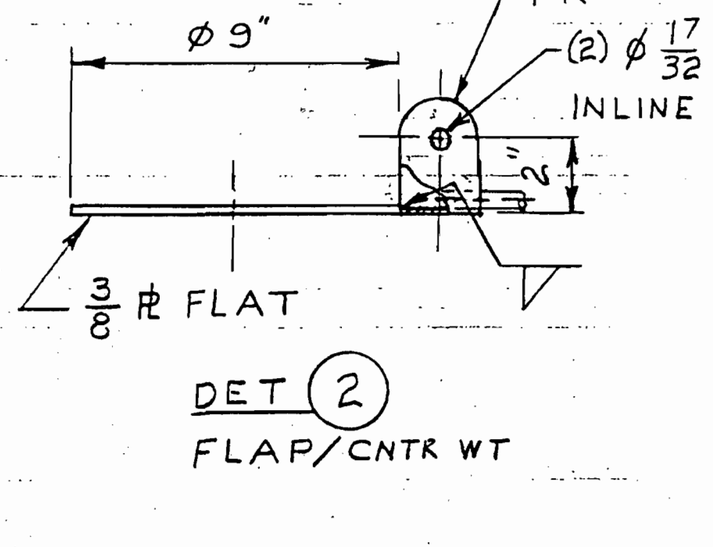
SECT:	SCALE: NONE	DATE: 2-3-81
DR. KG		DRAWING NO. SK-3
TR.		
CH.		











NOTE

1. FURN.
   - (1) 1/2 -13 NC X 3" HEX HD BOLT
   - (1) 1/2" NUT
   - (1) 1/2 LOCK WASH.
2. PRIME & PAINT (GREY)
3. QTY

GARDINIER INC.
U. S. PHOSPHORIC PRODUCTS
EAST TAMPA. FLORIDA

MOLTEN SULFUR TANK VENT COVER

SECT:	SCALE:	DATE: 8-88
DR. L TR. CH.		DRAWING NO. SK-4