RINKER MATERIALS CORP.®
CEMENT - AGGREGATE - MATERIALS - REAL ESTATE
FIRST WITH THE BEST
P. O. BOX 24635 WEST PALM BEACH, FL 33416-4635 TELEPHONE (407) 833-5555

September 28, 1990

Mr. Willard Hanks, Permitting Engineer
Florida Department of Environmental Regulation
Bureau of Air Regulations
2600 Blair Stone Road
Twin Towers Office Building
Tallahassee, Florida 32301

Re: Permit to Constuct

Dear Mr. Hanks:

Find enclosed a Rinker Materials Corporation Application (and fee) to Construct for the installation and operation of a baghouse and custom design afterburner. The installation is an addition to the pollution control system on the existing rock dryer so that Rinker can comply with the Department's August 1, 1990 policy memorandum to control VOC emissions from soil thermal treatment facilities.

As per your discussion with Bill Voshell, Rinker request a meeting to discuss the Department's preliminary review of the application and permitting requirements. Bill Voshell, Ron Hawks of PEI and I am available preferably on October 18, 1990. October 17, 1990 could serve as an alternate date. Please confirm an acceptable date.

Should there be any questions in the interim, call me at 305/221-7645.

Sincerely,

Michael Vardeman WEV

Michael D. Vardeman
Manager Materials Substitution

Enclosures
MDV:lg
cc: S. Brooks, SE Dist
D. Hong, DERM

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001031

CORPORATE OFFICE - 1501 BELVEDERE ROAD - WEST PALM BEACH, FL 33406

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2 40

RINKER MATERIALS CORP.

P.O. BOX 24635
WEST PALM BEACH, FLORIDA
33416-4635

TO:

Mr. Willard Hanks, Permitting Eng.
Fla. Dept. Environmental Regulation
Bureau of Air Regulations
2600 Blair Stone Road
Twin Towers Office Bldg.
Tallahassee, Florida 32301

Rinker Materials

P.O. BOX 24635
WEST PALM BEACH, FL 33416-4635
PHONE (407) 833-5555

No. 024382 63-568/631

BARNETT BANK
CALHOUN AT JEFFERSON ST.
TALLAHASSEE, FL 32301

NO. 024382

DATE OCTOBER 02, 1990

$1,000 DOLLARS 00 CENTS

Amount of Check
$1,000.00

PAY TO THE ORDER OF

FLORIDA DEPARTMENT OF
ENVIRONMENTAL REGULATION
2600 BLAIRSTONE ROAD
TALLAHASSEE FL 32399

RINKER MATERIALS CORPORATION

Daniel Kelly

516
3/90

⑈024382⑈ ⑆063105683⑆ 2000002688⑈

2600 Blair Stone Road
Twin Towers Office Building
Tallahassee, Florida 32301

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Enclosures
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$1,000 pd
10-5-90
#157143

Florida Department of Environmental Regulation

Southeast District • 1900 S. Congress Ave., Suite A • West Palm Beach, Florida 33406 • 407-964-9668

Bob Martinez, Governor | Dale Twachtmann, Secretary | John Shearer, Assistant Secretary | Scott Benyon, Deputy Assistant Secretary

AC 13-187599

SOURCE TYPE: Afterburner [ ] New[1] [x] Existing[1]

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

COMPANY NAME: Rinker Materials Corporation COUNTY: Dade

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) stone dryer

SOURCE LOCATION: Street 1200 Northwest 137th Avenue City Miami

UTM: East Zone 17;558.2 km North 2851.3 km

Latitude 25 ° 46 ' 48 "N Longitude 80 ° 25 ' 10 "W

APPLICANT NAME AND TITLE: James S. Jenkins III, Vice President Cement Operations

APPLICANT ADDRESS: P. O. Box 650679, Miami, Florida 33265-0679

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Rinker Materials Corp.

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. Furthe I agree to maintain and operate the pollution control source and pollution contr faciliti in such a manner as to comply with the provision of Chapter 403, Flori Statutes, and all the rules and regulations of the department and revisions thereof. also understand that a permit, if granted by the department, will be non-transferab and I will promptly notify the department upon sale or legal transfer of the permitt establishment.

*Attach letter of authorization

Signed: James S. Jenkins, III

James S. Jenkins III, VP Cement Operations
Name and Title (Please Type)

Date: 9/16/90 Telephone No. 305-221-7645

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 ha been designed/examined by me and found to be in conformity with modern engineeri principles applicable to the treatment and disposal of pollutants characterized in t permit application. There is reasonable assurance, in my professional judgment, th

[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 ____________________

____
Name (Please Type)

____
Company Name (Please Type)

____
Mailing Address (Please Type)

Florida Registration No. 32530 Date: SEPT 28, 90 Telephone No. (407) 833-5555

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.

Modify existing stone dryer to process petroleum contaminated soil pursuant to Florida DER Policy Memorandum dated August 1, 1990. Project will include a baghouse and afterburner to fully comply with all rules and regulations.

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

Start of Construction 2/1/91 Completion of Construction 10/30/91

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.)

Baghouse $80,000

Afterburner $500,000

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

AO 13-127621, DER permit dated May 23, 1990.

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

if power plant, hrs/yr ____ ; if seasonal, describe: ____________________

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

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

   a. If yes, has "offset" been applied? No

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

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

2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. No

3. Does the State "Prevention of Significant Deteriorlation" (PSD) requirement apply to this source? If yes, see Sections VI and VII. No

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

5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? No

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

   a. If yes, for what pollutants? VOC

   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.

Controlled VOC emissions less than 25 tons/yr.

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

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

Description	Contaminants Type	Contaminants % Wt	Utilization Rate - lbs/hr	Relate to Flow Diagram
Soil	Limestone, sand	100	72,000	Attachment A 4
	Petroleum	6000 ppm	480	Attachment A
	Water	10	8,000	Attachment A

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

1. Total Process Input Rate (lbs/hr): 40 tons/h (10% moisture)

2. Product Weight (lbs/hr): 36 tons/h (0% moisture)

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] Maximum lbs/hr	Emission[1] Actual T/yr	Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission lbs/yr	Potential[4] Emission T/yr	Relate to Flow Diagram
PM	<1.0	4.38	Process weight eq.	31.0		5256	7
VOC	2.5	10.5	95% control	24.0		2102	7
CO	2.1	9.2		NA		9.2	7
NO_x	6.3	27.8		NA		27.8	7
SO_2	27.16	118.96				118.96	7

[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).

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

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

Description	Contaminants Type	Contaminants % Wt	Utilization Rate - lbs/hr	Relate to Flow Diagram

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

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

2. Product Weight (lbs/hr): ______________________

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

fugitive dust baghouse

Name of Contaminant	Emission[1] Maximum lbs/hr	Emission[1] Actual T/yr	Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission lbs/yr	Potential[4] Emission T/yr	Relate to Flow Diagram
PM	0.5	2.3	Process wt eq.	31			

[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)
Multicyclone	PM	85	>10 μm	Engr. calculation
Baghouse	PM	99.9	>1.0μm	Engr. calculation
Afterburner	VOC	99.5	NA	Design

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
Waste oil	193 gal/min	193 gal/min	27.4
Dist. oil	193 gal/min	193 gal/min	27.4
Natural gas	2.5×10^4 ft^3	2.5×10^4 ft^3	27.4

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

Fuel Analysis: 0.25% Distillate

Percent Sulfur: 0.12% Waste oil   Percent Ash: unknown

Density: 7.4 lbs/gal   Typical Percent Nitrogen: unknown

Heat Capacity: ______ BTU/lb   142,000 BTU/gal

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

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

Annual Average 0   Maximum ______

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

Processed soil to be returned to site as clean fill per Florida DER 17-775 F.A.C. or used as substitute cement raw materials.

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

Stack Height: 80 ft. Stack Diameter: 4.5 ft.

Gas Flow Rate: 36,500 ACFM 9770 DSCFM Gas Exit Temperature: 800 °F.

Water Vapor Content: 28 % Velocity: 50 FPS

SECTION IV: INCINERATOR INFORMATION

Type of Waste	Type O (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						480	
Uncontrolled (lbs/hr)						480	

Description of Waste Petroleum products in dryer flue gases

Total Weight Incinerated (lbs/hr) 480 Design Capacity (lbs/hr) 480

Approximate Number of Hours of Operation per day 24 day/wk 7 wks/yr. 52

Manufacturer IT/McGill

Date Constructed 10/1/91 Model No. custom design

	Volume (ft)^3	Heat Release (BTU/hr)	Fuel Type	Fuel BTU/hr	Temperature (°F)
Primary Chamber	565	15×10^6	N.G.	15×10^6	1600
Secondary Chamber					

Stack Height: 80 ft. Stack Diamter: 4.5 Stack Temp. 800

Gas Flow Rate: 36,500 ACFM 9770 DSCFM* Velocity: 50 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 [x] Afterburner

[ ] Other (specify)

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

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
micropul BH	PM	99.9	>1.0 μm	design

E. Fuels

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

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

Fuel Analysis:

Percent Sulfur: ____________ Percent Ash: ____________

Density: ____________ lbs/gal Typical Percent Nitrogen: ____________

Heat Capacity: ____________ BTU/lb ____________ BTU/gal

Other Fuel Contaminants (which may cause air pollution): Waste oil components.

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

Annual Average ____________ Maximum ____________

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

fugitive dust baghouse

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

Stack Height: 45 ft. Stack Diameter: 1.0 x 1.0 ft.

Gas Flow Rate: 5000 ACFM 3070 DSCFM Gas Exit Temperature: 400 °F.

Water Vapor Content: 0 % Velocity: 60 FPS

SECTION IV: INCINERATOR INFORMATION

Type of Waste	Type O (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: Afterburner system will consist of heat exchanger to preheat flue gases; afterburner; heat exchanger to preheat dryer combustion air and stack

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

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

SECTION V: SUPPLEMENTAL REQUIREMENTS

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]

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

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

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

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

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

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

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

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

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

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

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

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.

ATTACHMENT A

DRYER DESCRIPTION

The existing stone dryer is a 7 by 80 foot rotary dryer that was installed as part of the original plant equipment. Because of the higher temperatures required to remove petroleum products from soil, the burner and drum are to be modified to achieve a product temperature of 1500°F. The existing Todd Shipyard burner will be replaced with a Gencor ultraflame burner to provide a design heat input of 27.5×10^6 Btu/h. This burner is a low excess air design (30%) and provides maximum turn down and control stability.

To insure complete soil desorption and uniform temperature, the drum will be flighted and soil preheated in the drum as it moves countercurrent to the flame. Maximum production will be 40 tons/h with production adjusted to rates necessary to produce the required soil discharge temperatures. The soil temperature required will be determined by type of petroleum product and concentration.

The operation will reduce petroleum levels in the soil to clean fill standards (i.e., <5 ppm), which can allow the soil to be returned to the clean up site or used in the cement plant raw feed.

All particulate matter collected by the multicyclone and baghouse will be returned to the feed to ensure complete contaminate removal. The dust system will use screw conveyors and elevator.

Tables 1, 2, and 3 are heat and mass balances for the dryer at 27.5 tons/h feed rate (heavy organics) and 40 tons/h (light organics). Figure A-1 is a flow diagram for the system. Figures A-2 and A-3 are dryer mass balance outputs at 1000°F and 1500°F, respectively.

<u>Feed System Description</u>

Soil will be received and the required tests performed to ensure compliance with off-specification used oil limitations (i.e., arsenic, lead, halogens, etc.). The soil will be placed in the raw material gallery in separate bins for discharge to the roaster. Before placement in the roaster, the soil will be screened to remove large rocks, debris, trash, roots, etc. Oversize stone will be crushed and rescreened to insure uniform feed size to the roaster. Soil will be transferred to the roaster feed bin using an inclined belt feeder. Treated soil will be discharged from the roaster and transferred to the raw material gallery using a bucket elevator and drop leg (stacker).

TABLE 1. DRYER OPERATING CONDITIONS

	1	2	3	4
Feed rate, tons/h	27.5	40.0	27.5	40.0
Moisture, %	10	10	10	10
Product rate, tons/h	24.75	36.0	24.75	36.0
Drum speed, RPM	7.0	8.5	7.0	8.5
Flue gas weight, lb/h	28,636	33,551	30,447	35,562
CO_2, % volume	11.79	11.79	11.79	11.79
O_2, % volume	5.06	5.06	5.06	5.06
N_2, % volume	83.1	83.1	83.1	83.1
H_2O, % volume	34.3	39.6	32.98	
Temperature, °F	350	350	350	350
Volume, acfm	10,872	13,060	11,487	16,875
Combustion air weight, lb/h	21,957	24,248	23,675	26,157
Temperature, °F	400	400	90	90
Fuel type	oil	oil	oil	oil
Fuel weight, lb/h	1,179.5	1,302.0	1,271.8	1,405.2
Heat input, 10^6 Btu	23.0	25.4	24.8	27.4
Efficiency, 10^6 Btu/ ton (wet)	0.836	0.635	0.902	0.685
Efficiency, 10^6 Btu/ ton (wet)	0.929	0.705	1.00	0.761
Product temperature, °F	1,500	1000	1500	1000
Burner excess air, %	30	30	30	30

TABLE 2. DRYER MASS BALANCE

	1	2	3	4
Mass input				
Fuel, lb/h	1,179.5	1,302.6	1,271.8	1,405.1
Stone, lb/h	55,000.0	80,000	55,000.0	80,000.0
Combustion air, lb/h	21,956.9	24,248.1	23,675.3	26,157.4
Total, lb/h	78,136.4	105,550.7	79,947.9	107,562.5
Mass output				
Dry flue gases, lb/h	21,818.1	24,094.8	23,525.9	25,992.3
Wet gases, lb/h	6,818.3	9,455.8	6,921.2	9,570.2
Dry stone, lb/h	49,500.0	72,000.0	49,500.0	72,000.0
Total, lb/h	78,136.4	105,550.7	79,947.9	107,567.5

TABLE 3. DRYER HEAT BALANCE

	1		2		3		4	
	10^6 Btu/lb	%	10^6 Btu/lb	%	10^6 Btu/lb	%	10^6 Btu/lb	%
Heat input								
Fuel	23.00	90.62	27.40	96.52	24.80	97.06	25.40	90.19
Stone	0.273	1.07	0.397	1.40	0.273	1.07	0.397	1.42
Moisture liquid	0.154	0.606	0.224	0.79	0.154	0.60	0.224	0.79
Combustion air	1.955	7.70	0.364	1.29	0.329	1.29	2.141	7.60
Total	25.38	100.00	28.385	100.00	25.55	100.00	28.163	100.00
Heat output								
Dry stone	14.32	56.60	13.73	48.46	14.32	56.07	13.73	48.91
Dry flue gases	1.495	5.91	1.782	6.28	1.613	6.32	1.65	5.88
Moisture	8.288	32.75	11.63	41.03	8.41	32.93	11.49	40.93
Radiation	1.200	4.74	1.20	4.23	1.20	4.69	1.20	4.28
Total	25.30	100.00	28.34	100.00	25.54	100.00	28.07	100.00

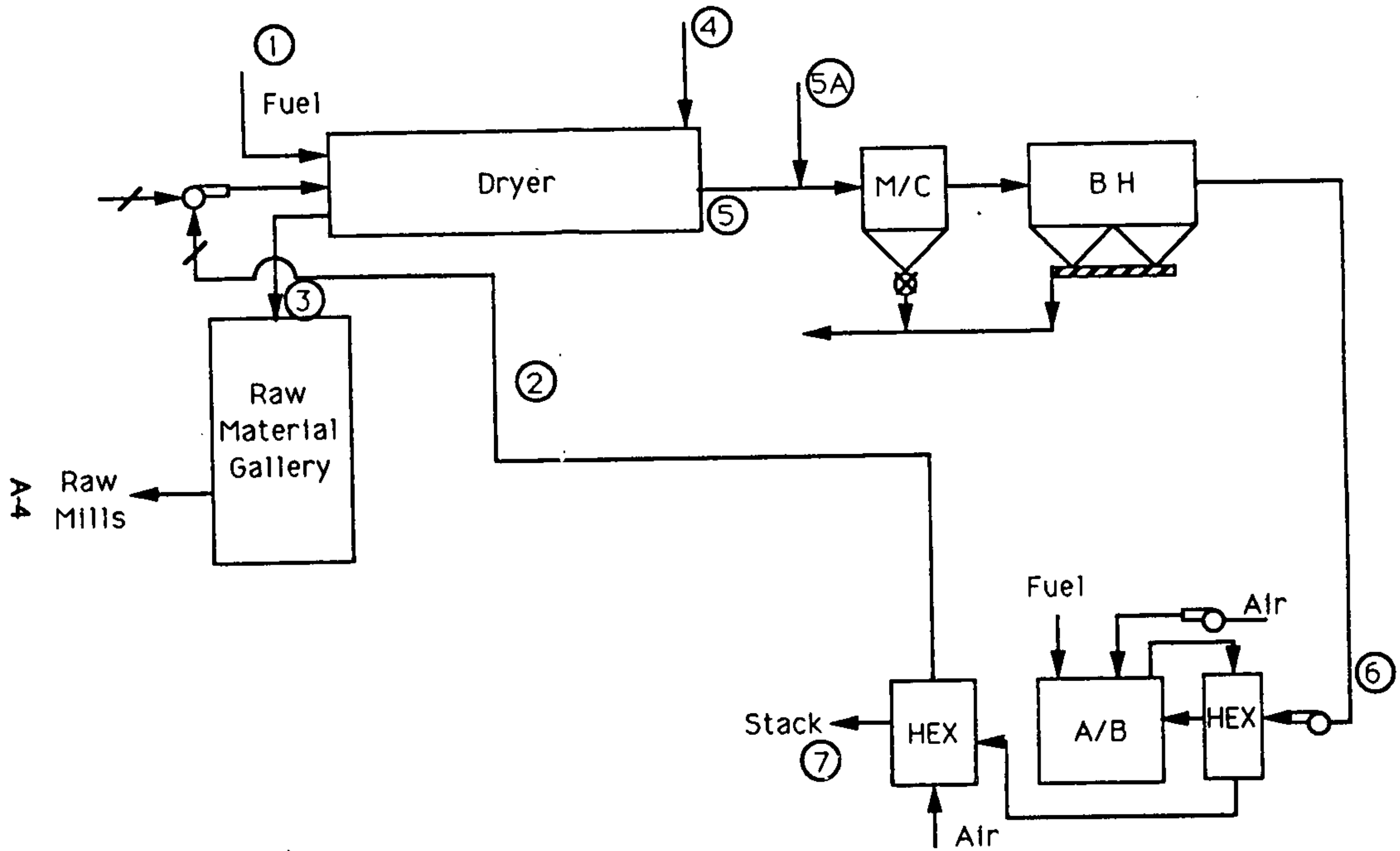


Figure A-1. Dryer flow diagram/mass balance.

STREAM NO.	MEDIA TYPE	MASS LB/HR	TEMP F	FLOW WSCFM	FLOW DSCFM	FLOW ACFM	CO_2 %V/V	O_2 %V/V	N_2 %V/V	H_2O %V/V	CO_2 LB/HR	O_2 LB/HR	N_2 LB/HR	H_2O LB/HR
1	OIL	1302.0	90	-	-	-	-	-	-	-	-	-	-	-
2	AIR	24248.0	400	5388	5388	8777	0.00	20.90	79.10	0.00	0	5626	18622	0
3	DRY STONE	72000.0	1000	-	-	-	-	-	-	-	-	-	-	-
4	WET STONE	80000.0	60	-	-	-	-	-	-	-	-	-	-	5565
5	FLUE GAS	33550.6	350	8513	5139	13060	11.79	5.06	83.13	39.60	4156	1294	18634	9456
5A	AIR	2596.0	90	578	578	600	0.00	20.90	79.10	0.00	0	602	1994	0
6	FLUE GAS	36146.6	335	9087	5716	13683	10.69	6.70	82.73	37.09	4156	1896	20628	9456

Figure A-2. Dryer mass balance at 400°F preheated combustion air/1000°F.

STREAM NO.	MEDIA TYPE	MASS LB/HR	TEMP F	FLOW WSCFM	FLOW DSCFM	FLOW ACFM	CO_2 %V/V	O_2 %V/V	N_2 %V/V	H_2O %V/V	CO_2 LB/HR	O_2 LB/HR	N_2 LB/HR	H_2O LB/HR
1	OIL	1179.5	90	-	-	-	-	-	-	-	-	-	-	-
2	AIR	21956.9	400	4879	4879	7947	0.00	20.90	79.10	0.00	0	5094	16863	0
3	DRY STONE	49500.0	1500	-	-	-	-	-	-	-	-	-	-	-
4	WET STONE	55000.0	60	-	-	-	-	-	-	-	-	-	-	5565
5	FLUE GAS	28636.4	350	7087	4654	10872	11.79	5.06	83.13	34.30	3764	1172	16874	6818
5A	AIR	5013.0	90	482	482	502	0.00	20.90	79.10	0.00	0	502	1731	0
6	FLUE GAS	34958.0	335	8022	5135	12079	10.69	6.50	82.77	35.99	3968	1674	18605	6945

Figure A-3. Dryer mass balance at 400°F preheated combustion air/1500°F.

ATTACHMENT B

DESCRIPTION OF CONTROL EQUIPMENT

A. Multicyclone

Joy-Western
35 tubes, 9" diameter (27 active)
3.5 in. H_2O pressure drop
13,680 acfm
335°F

B. Fabric Filter

Pulse-jet cleaning
Micropul
238 bags; 4.5 inches diameter; 12 ft long
3366 ft^2 cloth area
Fiberglass cloth
4.16 air-to-cloth ratio
14,000 acfm at 335°F (450°F max.)
6.0 in. H_2O expected pressure drop
0.02 gr/dscf outlet loading

C. Afterburner

Fuel: natural gas
Heat input: 15×10^6 Btu/h (max.)
30%: excess air
1600°F: combustion temperature
0.75 s: residence time
563 ft^3: primary chamber volume
99.5%: efficiency
Manufacturer: IT/McGill, Tulsa, OK

D. Fugitive Fabric Filter

Pulse-jet cleaning
Micropul
130 bags; 4.5 inches diameter; 8 ft long
4.0 ft^2 cloth area
Nomex cloth
4.0 air-to-cloth ratio
5000 acfm at 400°F
4 in. H_2O expected pressure drop
0.02 gr/dscf outlet loading

ATTACHMENT C

AFTERBURNER SYSTEM DESCRIPTION

The afterburner used to destroy organics that are volatilized from the soil will be a direct natural gas-fired system. The dryer flue gases will be preheated to 750°F using a heat exchanger at the afterburner exhaust.

Combustion temperature in the afterburner is 1600°F at 30 percent excess air. Expected destruction efficiency is 99.5 percent on heavy hydrocarbons. The design system residence time is 0.75 seconds.

Combustion air for the dryer burner will be preheated using a second heat exchanger. A portion of the afterburner flue gases will be bypassed around the heat exchangers to maintain proper heat balance and prevent preignition of organics in the dryer exhaust.

The afterburner maximum heat input will be 15 x 10^6 Btu/h. This heat input would only occur during the startup period. A reduced heat input would be required during operation because of the heat release from the organics (VOC) in flue gas stream.

The system will be equipped with all flame safety and interlock controls as necessary to comply with the local codes. Combustion chamber temperature will be controlled by a feed back loop to maintain set points. A flow diagram for the system is provided in Figure C-1.

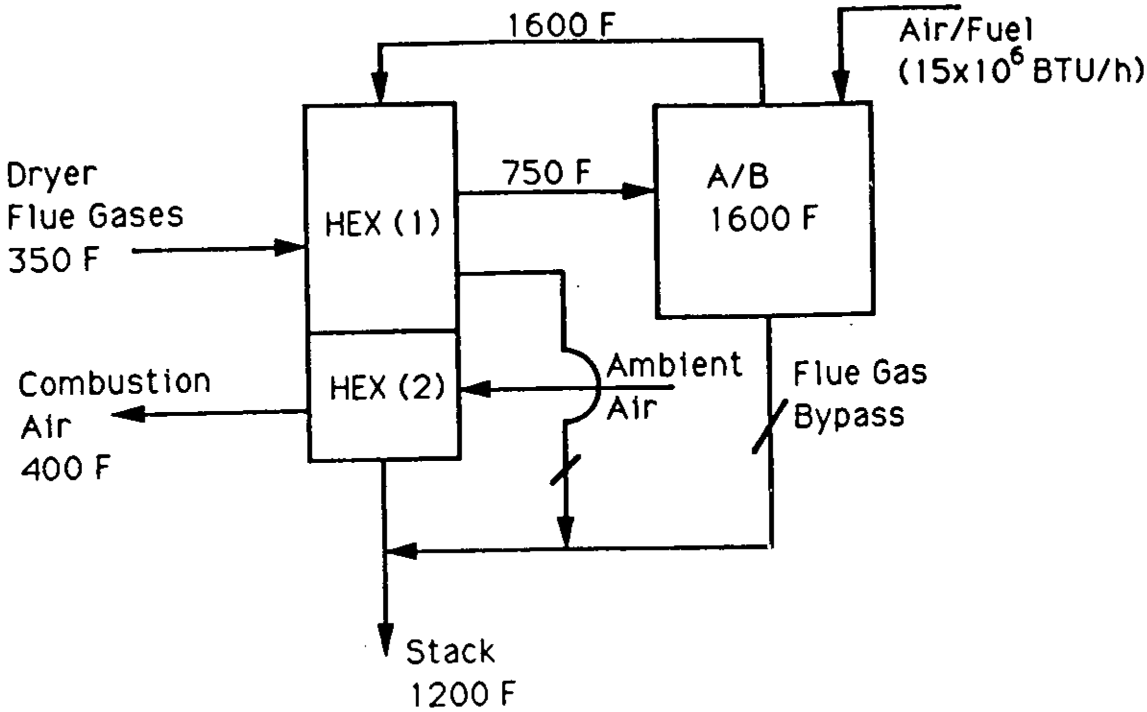


Figure C-1. Afterburner system arrangement.

ATTACHMENT D

EMISSION ESTIMATES

Pollutant emission estimates are based on expected maximum operating conditions and worst-case feed material. The highest soil contamination is assumed to be 6000 ppm of residual oil. This condition is not constantly expected but represents a worst-case situation. Because of the sulfur content of residual oil this greatly increases the potential SO_2 loss from the dryer (3.58 lb/h fuel combustion and 10 lb/h process loss from soil).

NO_x emissions are calculated based on NO_x generation from low excess air dryer burner and low excess air afterburner. An additional adjustment is made based on experience with the total system gas volume.

A. <u>NO_x</u>

- Assumptions

  - 150 ppm NO_x on dryer burner based on 30 percent excess air in dry flue gases
  - 150 ppm NO_x on afterburner combustion based on burner dry flue gases
  - 15 ppm additional NO_x in total dry gas volume
  - Worst-case without organics; full burner operation

- Dryer

$$\frac{(27.5\text{x}10^6\ Btu/h)(8740\ scf/10^6\ Btu)(1.3)}{60\ \text{min}/h} = 5207 dscfm$$

$$\frac{(150 \times 10^{-6}\ scf\ NO_x\ /scf)(5207 scfm)(60\text{min}/h)}{12.8\ scf\ NO_x/lbNO_x} = 3.67\ lb/h$$

- Afterburner

$$\frac{(15 \times 10^6\ Btu/h)(8740\ scf/10^6\ Btu)(1.3)}{60\ \min/h} = 2841\ dscfm$$

$$\frac{(150 \times 10^{-6}\ scf\ NO_x/scf)(2841\ dscfm)(60\ \min/h)}{12.8\ scf\ NO_x/lb\ NO_x} = 1.99\ lb/h$$

Total gas

$$\frac{(15 \times 10^{-6}\ scf\ NO_x/scf)(60\ \min/h)(9773\ scfm)}{12.8\ scf\ NO_x/lb\ NO_x} = 0.687\ lb/h$$

Total NO_x = 6.34 lb/h

B. CO

- Assumptions

  - 50 ppm CO remaining in afterburner flue gases (dry basis)
  - 30 percent excess air

$$\frac{(50 \times 10^{-6}\ scf\ CO/scf)(9773\ scfm)(60\ \min/h)}{13.76\ scf\ CO/lb\ CO} = 2.1\ lb/h$$

C. SO_2

- Assumptions

  - Distillate oil used in dryer with sulfur content of 0.25 percent
  - Fuel oil heat content 142,000 Btu/gal
  - Dryer heat input 27.5 x 10^6 Btu/h
  - Natural gas used on afterburner
  - Maximum 6000 ppm residual oil in soil at 2.1 percent S

- Dryer Burner

$$\frac{27.5 \times 10^6 \ Btu/h}{142{,}000 \ Btu/gal} = 193.7 \ gal/h$$

$$\left(193.7 \ \frac{gal}{h}\right)\left(7.4 \ \frac{lb}{gal}\right) = 1433 \ lb/h$$

$$\frac{(2)(0.25 \ \%S)}{100}(1433 \ lb/h) = 7.16 \ lb/h$$

- Afterburner

$$(15 \times 10^6 \ \frac{Btu}{h}) \rightarrow neg. \ sulfur$$

- Fuel in Soil

$$(2)(40 \ ton/h)(2000 \ lb/ton)(6000 \times 10^{-6})(\frac{2.1}{100} \%S) = 20 \ lb/h$$

Total SO_2 = 27.16 lb/h

D. VOC

- Potential (40 tons/h)(2000 lb/ton)(6000 x 10^{-6}) = 480 lb/h
- Controlled (1 - 0.995)(480 lb/h) = 2.4 lb/h

E. PM

- Assumptions

  - 0.02 gr/acf at baghouse exit

$$\frac{(5716\ dscfm)(0.02\ gr/dscf)(60\ min/h)}{7000\ gr/lb} = 0.97\ lb/h$$

- Afterburner firing rate

$$\frac{15 \times 10^6\ Btu/h}{1100\ Btu/cf\ (10^6)} = 0.0136\ mm\ cf/h$$

$$(0.0136\ mm\ \frac{cf}{h})(1.0\ \frac{lb}{mm\ cf}) = 0.0136\ lb/h\ (neg)$$

Total PM < 1.0 lb/h

ANNUAL POTENTIAL EMISSIONS

	lb/h	lb/yr	tons/yr
PM	1200	10,512,000	5256
SO_2	27.16	237,922	118.96
CO	2.1	18,396	9.19
VOC	480	4,204,800	2102.4
NO_x	6.34	55,538	27.77

ANNUAL ACTUAL CONTROLLED EMISSIONS

	lb/h	lb/yr	tons/yr
PM	1.0	8,760	4.38
SO_2	27.16	237,922	118.96
CO	2.1	18,396	9.19
VOC	2.4	21,024	10.51
NO_x	6.34	55,538	27.77

ATTACHMENT E

FUGITIVE DUST CONTROL

A material stacker will be used to place treated soil in the raw-material gallery. The stacker and elevator will be vented to a baghouse to control fugitive dust. Ambient air will be mixed with vent gases to maintain baghouse temperature below 400°F (Figure E-1).

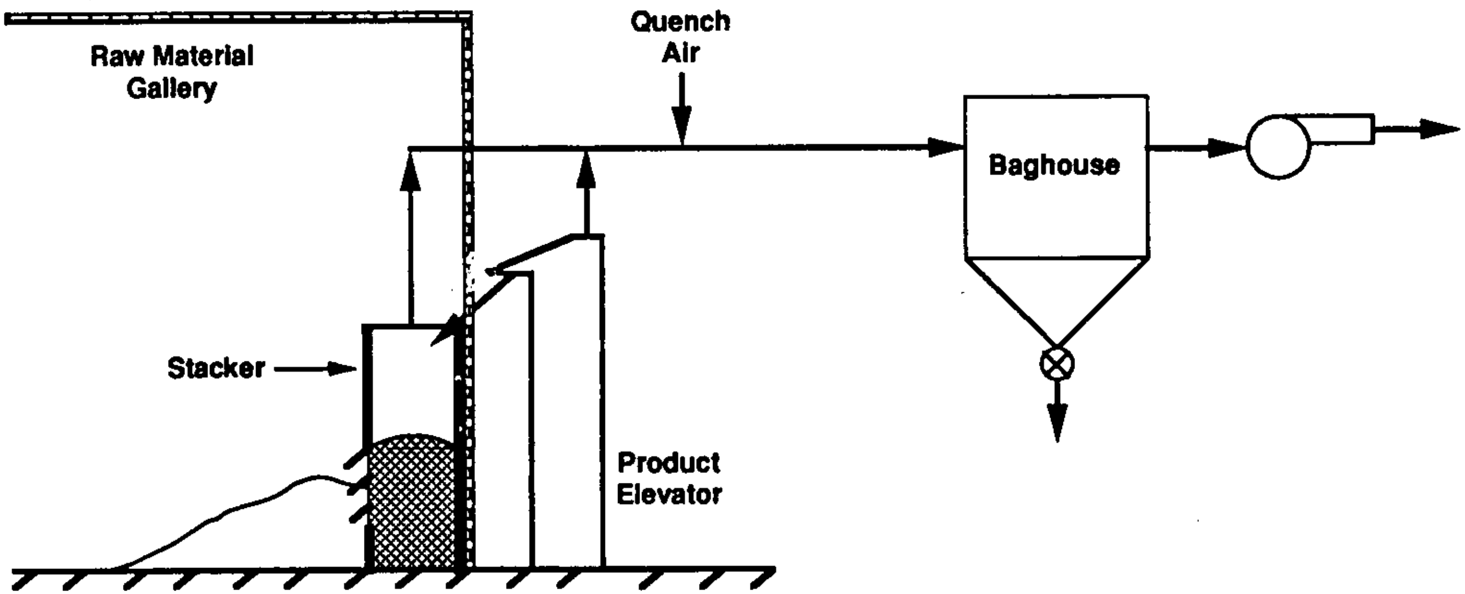
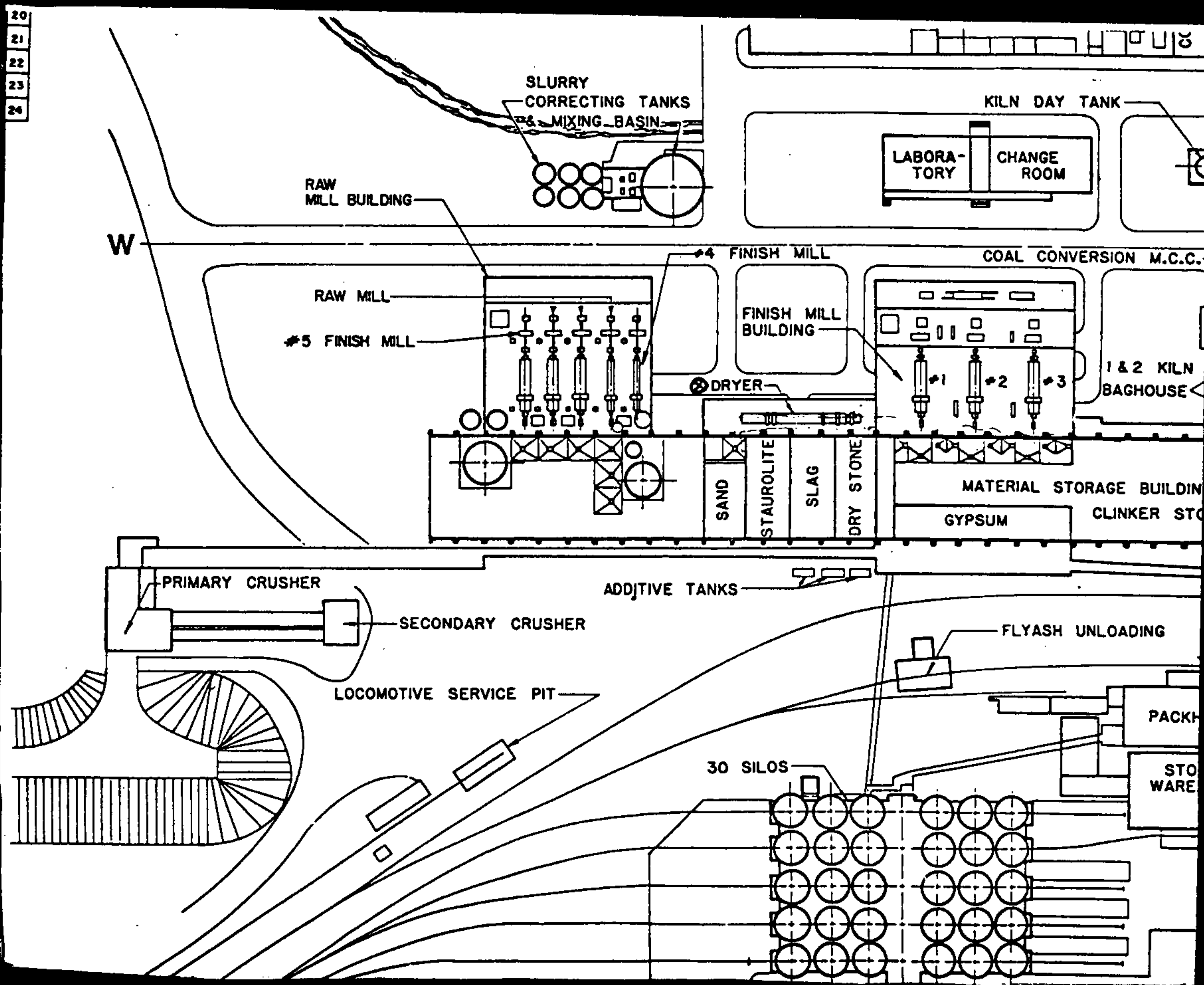


Figure E-1. Stacker fugitive dust control system.



20
21
22
23
24
SLURRY
CORRECTING TANKS
& MIXING BASIN
KILN DAY TANK
LABORA-TORY
CHANGE ROOM
RAW MILL BUILDING
W
#4 FINISH MILL
COAL CONVERSION M.C.C.
RAW MILL
#5 FINISH MILL
FINISH MILL BUILDING
1 & 2 KILN BAGHOUSE
DRYER
#1
#2
#3
SAND
STAUROLITE
SLAG
DRY STONE
MATERIAL STORAGE BUILDIN
GYPSUM
CLINKER STO
PRIMARY CRUSHER
ADDITIVE TANKS
SECONDARY CRUSHER
FLYASH UNLOADING
LOCOMOTIVE SERVICE PIT
PACKH
30 SILOS
STO
WARE