APPLICATION TO AMEND FDER AIR POLLUTION SOURCE PERMIT AC27-173474 FOR PERFORMANCE TESTING OF WASTE TIRES AND USED OIL IN CEMENT KILN NO. 2

and
AC27-138850
PSD-FL-124
-124A

FLORIDA MINING AND MATERIALS
BROOKSVILLE, FLORIDA

September 14, 1990

Cross/Tessitore & Associates, P.A.
4763 South Conway Road, Suite F.
Orlando, Florida 32812
(407) 851-1484
F03.178/FMM2TIRE

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Florida Department of Environmental Regulation
Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

DER Form #
Prior Title
Effective Date
DER Application No. (Assigned by DER)

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Portland Cement Plant [ ] New[1] [X] Existing[1]

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

COMPANY NAME: Moore McCormack, Inc. d/b/a Florida Mining & Materials COUNTY: Hernando

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) No. 2 Cement Kiln

SOURCE LOCATION: Street U.S. Highway 98 City NW of Brooksville

UTM: East 17-356 North 3169

Latitude 28 ° 38' 34"N Longitude 82 ° 28' 25"W

APPLICANT NAME AND TITLE: C. M. Coleman Jr., Vice President and General Manager

APPLICANT ADDRESS: P.O. Box 6, Brooksville, Florida 34605-0006

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Moore McCormack Inc. d/b/a Florida Mining & Materials

I certify that the statements made in this application for a modification 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: _____

~~Vice President~~
C.M. Coleman Jr., and General Manager
Name and Title (Please Type)

Date: 09/14/90 Telephone No. (904) 796-7241

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

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

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

Northwest District 160 Governmental Center Pensacola, Florida 32501-5794 904-436-8300
Northeast District 3426 Bills Rd. Jacksonville, Florida 32207 904-798-4200
Central District 3319 Maguire Blvd., Suite 232 Orlando, Florida 32803-3767 407-894-7555
Southwest District 4520 Oak Fair Blvd. Tampa, Florida 33610-7347 813-623-5561
South District 2269 Bay St. Fort Myers, Florida 33901-2896 813-332-7975
Southeast District 1900 S. Congress Ave., Suite A West Palm Beach, Florida 33406 407-964-9505

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 Joseph L. Tessitore

Joseph L. Tessitore, P.E.
Name (Please Type)

Cross/Tessitore & Associates, P.A.
Company Name (Please Type)

4763 S. Conway Rd., Ste. F, Orlando, Florida 32812
Mailing Address (Please Type)

Florida Registration No. 23374 Date: 9/14/90 Telephone No. (407)851-1484

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 Supplemental Information: Section II

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

Start of Construction N/A Completion of Construction N/A

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.) The following information represents the initial costs associated with the existing baghouse system. No additional air pollution control equipment will be required for the subject modification.

Baghouse Equipment	$2,825,000.00
Erection	$2,800,000.00
Total	5,625,000.00

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

See Supplemental Information: Section II

E. Requested permitted equipment operating time: hrs/day -- ; days/wk -- ; wks/yr -- ; 8,200 hrs/yr

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? No

   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. Yes[1]

3. Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections VI and VII. Yes[2]

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

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

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.

[1] BACT has been determined for particulate emissions under the previous Permit AC 27-30450; BACT has been determined for Sulfur Dioxide and Nitrogen Dioxide (NO_X) under the previous Permit AC 27-138850. No BACT review was required for Carbon Monoxide and Volatile Organic Compound emissions.

[2] PSD review for particulate, Sulfur Dioxide and Nitrogen Dioxide (NO_X) was conducted under previous Permits AC 27-30450 and AC 27-138850 (PSD-FL-124).

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		
Limestone	Particulate	0.02	207,640	
Sand/Clay	Particulate	0.08	20,774	See Supplemental
Fly Ash	Particulate	0.14	26,182	Information: Section II
Staurolite	Particulate	1.40	2,704	
Mill Scale	Particulate	1.40	2,704	

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

1. Total Process Input Rate (lbs/hr): 260,000

2. Product Weight (lbs/hr): 159,250

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	
	See Supplemental		Information:	Section III			

[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)
Fuller Reverse Air (Variable Cycle) Fabric Filter	Particulate	99.9	0-60	Testing

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
See Supplemental Information: Section III			

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

Fuel Analysis: See supplemental information: Section II

Percent Sulfur: _____ Percent Ash: _____

Density: _____ lbs/gal Typical Percent Nitrogen: _____

Heat Capacity: _____ BTU/lb _____ BTU/gal

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

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

Annual Average _____ Maximum _____

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

Solids collected from the fabric filter during normal operation will be returned to the kiln feed and recycled through the system.

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

Stack Height: 90 ft. Stack Diameter: 14.0 ft.

as Flow Rate: 300,000 ACFM 199,000 DSCFM Gas Exit Temperature: ~380 °F.

Water Vapor Content: ~10 % Velocity: 24.87 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			NOT APPLICABLE				
Uncontrolled (lbs/hr)							

Description of Waste _____

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

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

anufacturer_____

ate Constructed _____ Model No. _____

	Volume $(ft)^3$	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber		NOT APPLICABLE			
Secondary Chamber					

tack 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:

NOT APPLICABLE

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

NOT APPLICABLE

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

SECTION V: SUPPLEMENTAL REQUIREMENTS

See Supplemental Information: Section V

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.

NOT APPLICABLE

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

BACT levels have been previously determined in Permit AC 27-138850 and previous Permit AC27-30450

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

NOT APPLICABLE

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.

NOT APPLICABLE

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:

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
NOT APPLICABLE	

(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
NOT APPLICABLE	

(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 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).

NOT APPLICABLE

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.

SUPPLEMENTAL INFORMATION: SECTION II

1. Project Description
2. Table II-1
   Proposed Performance Test Matrix
3. Figure II-1
   Kiln No. 2 Process Flow Diagram
4. Figure II-2
   Kiln No. 2 Temperature and
   Retention Time Profile
5. Table II-2
   Permitting and
   Compliance Activities
6. Table II-3
   Summary of Test Parameters

PROJECT DESCRIPTION

The subject of this application is to request that FDER Permit AC27-173474 be amended to allow Florida Mining and Materials to conduct performance tests on Cement Kiln No. 2 for the burning of waste tires, used oil, and coal in various combination as presented in Table II-1.

The purpose of this testing is to allow Florida Mining and Materials (FM&M) to:

(1) Evaluate the energy conservation benefits of utilizing waste tires and used oil as a fuel supplement to coal.

(2) Determine if the existing facility in its present physical configuration is capable of operating with these fuel combinations.

(3) Determine emission levels from the cement kiln during operation with these various fuel combinations.

The proposed performance test would include emission testing for the four separate fuel combinations as presented in Table II-1. The proposed test parameters and methods are provided in Table II-2. The results of this emission testing will be reported to FDER and may be used as a basis for amending FDER permit AC27-173474 for permanent operation with waste tires and used oil as supplemental fuels.

The cement kiln system provides an excellent environment for utilization of waste tires and used oil as kiln fuels. Initially, thermal destruction of organic compounds is ensured by the available combustion conditions, including temperatures of at least 2800° F and retention times of up to four (4) seconds within the kiln itself. Turbulent gas flow is maintained throughout the kiln which further enhances the environment for thermal destruction. Further in the system, exhaust gases are exposed to a counter current flow of raw materials feed which consists largely of calcium carbonate. Thus conditions are present for effective neutralization of acid gases contained in the exhaust. The counter current flow includes a high concentration of particulate matter which provides substantial surface area for condensation of volatile metal species as well as any residual organic compounds. To complete the system, the fabric filter then provides for maximum removal of particulates from the gas stream. Each of these phases combine to make up an efficient industrial process which offers a perfect opportunity for use of these fuel resources with an insignificant impact on the environment.

Estimated emissions relating to the current permit FDER No. AC27-173474 are detailed in the supporting information for Sections III and V of this application. No increase in emissions for currently limited compounds is expected as a result of this permit amendment. The baghouses currently operated with the No. 2 Kiln will remain as the air pollution control device, thus continuing to provide Best Available Control Technology as previously determined.

No significant emission increases are expected for particulates and/or SO_2 due to the high removal efficiency of the system as demonstrated in the attached Section V. Also, NO_x emissions are expected to decrease due to the use of waste tires since this would provide a better distribution of heat release and less fixation of atmospheric nitrogen. For the case of CO and HC, the emission rates are based on the process

combustion efficiency, and due to the high temperatures and long retention times, no decrease in combustion efficiency is expected.

For the case of the remaining compounds listed in Table II-3 (Metals, PCDDS/PCDFS, Polynuclear Aromatic Hydrocarbons, Benzene, Mercury) no substantial data base is available to estimate emission rates from the kiln No. 2 process. Although it can be generalized that the combination of high particulate removal, caustic scrubbing, and high combustion efficiency would minimize these emissions, exact emission rates for the various fuel combinations in Table II-1 cannot be determined. Therefore, it is the intent of the performance test to measure the baseline levels during coal combustion and subsequent emission changes for the various waste tire and used oil combinations.

In conclusion, it should be emphasized that this requested amendment does not include any significant and/or substantial change to the Kiln No.2 physical system and includes only the substitution of waste tires and used oil for coal. This amendment only includes the performance testing of Kiln No. 2 with these fuels and is not for operational purposes. It is also understood that any operation after the performance testing with these fuels would require a permanent amendment of Kiln No.2 Permit AC27-173474 by FDER and EPA.

TABLE II-1

PROPOSED PERFORMANCE TEST MATRIX

The proposed testing would include stack sampling during four separate cases for the kiln. These are represented in the following matrix.

Fuel Type	Test Conditions 1*	2	3	4
	% of Total Fuel Supply			
Coal (min.)	100	80	50	30
Waste Tires (max.)	0	20	0	20
Used Oil (max.)	0	0	50	50

*Baseline

FMM2TIRE.DOC

FIGURE II-1

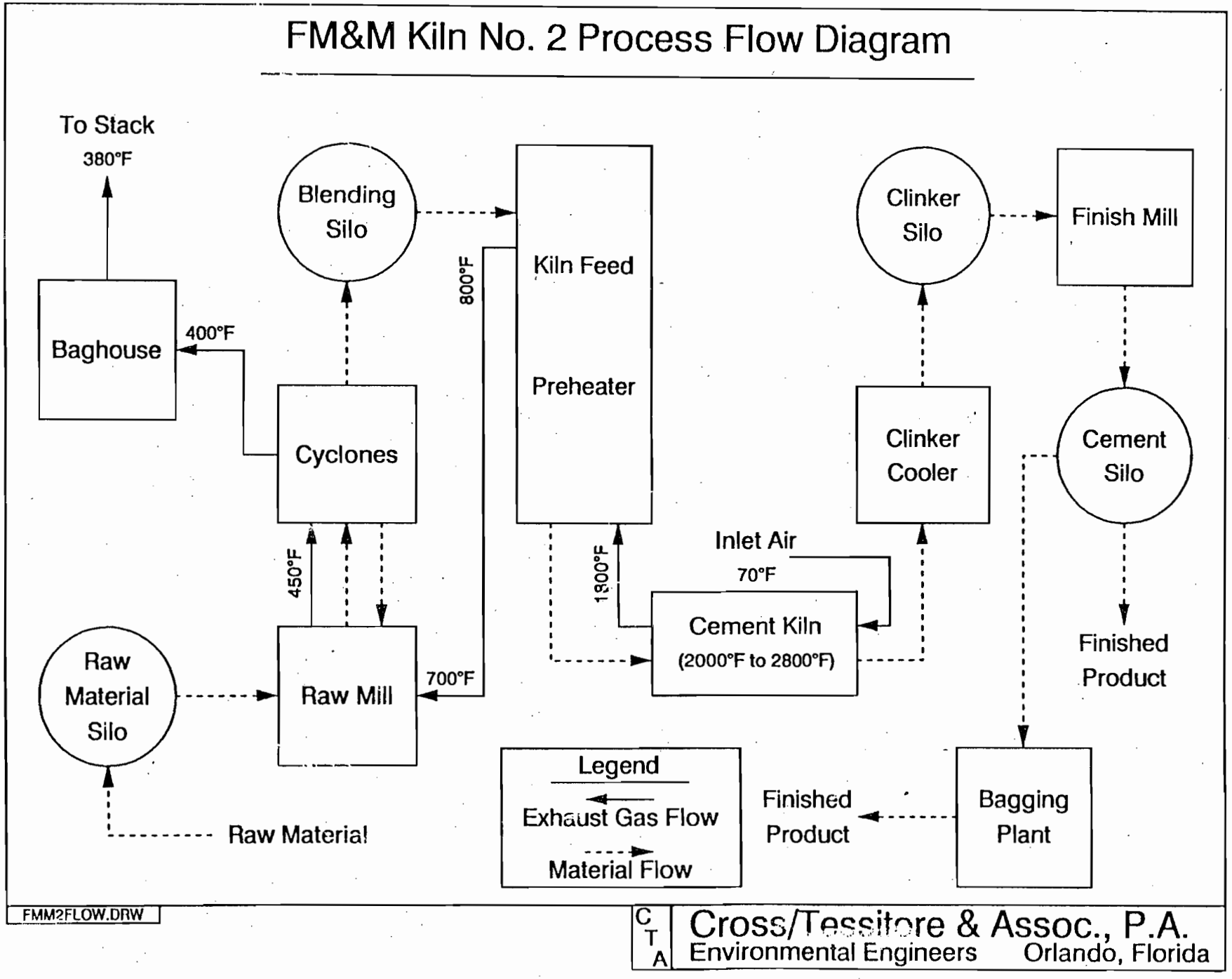
FM&M Kiln No. 2 Process Flow Diagram
To Stack
380°F
Blending Silo
Kiln Feed
Preheater
800°F
Clinker Silo
Finish Mill
Baghouse
400°F
Cyclones
Clinker Cooler
Cement Silo
450°F
1900°F
Inlet Air
70°F
Cement Kiln
(2000°F to 2800°F)
Finished Product
Raw Material Silo
Raw Mill
700°F
Raw Material
Legend
Exhaust Gas Flow
Material Flow
Finished Product
Bagging Plant
FMM2FLOW.DRW
C T A
Cross/Tessitore & Assoc., P.A.
Environmental Engineers
Orlando, Florida

FIGURE II-2

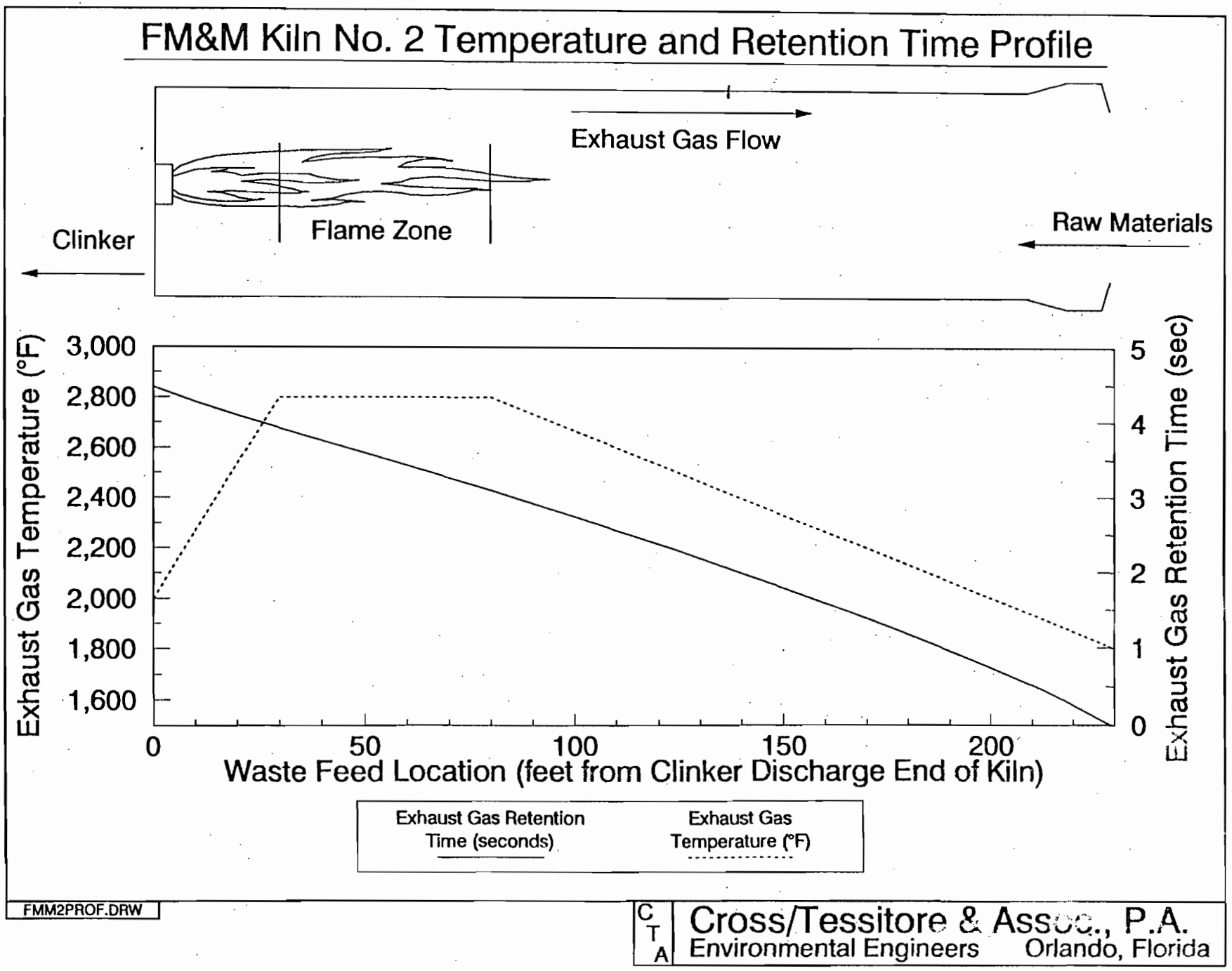
FM&M Kiln No. 2 Temperature and Retention Time Profile
Exhaust Gas Flow
Flame Zone
Clinker
Raw Materials
Exhaust Gas Temperature (°F)
3,000
2,800
2,600
2,400
2,200
2,000
1,800
1,600
Exhaust Gas Retention Time (sec)
5
4
3
2
1
0
0
50
100
150
200
Waste Feed Location (feet from Clinker Discharge End of Kiln)
Exhaust Gas Retention Time (seconds)
Exhaust Gas Temperature (°F)
FMM2PROF.DRW
C T A
Cross/Tessitore & Assoc., P.A.
Environmental Engineers
Orlando, Florida

TABLE II-2

PERMITTING AND COMPLIANCE ACTIVITIES

Activity	Number	Issued	Expired
Construction Permit	AC27-30450	July 25, 1980	December 31, 1983
Operating Permit	AO27-65207	August 16, 1983	August 16, 1988
Consent Order	OGC-86-1471	January 23, 1987	-----
Consent Order	OGC-87-1685	September 1, 1988	-----
Construction Permit	AC27-138850	November 3, 1988	January 1, 1990
Construction Permit	AC27-173474	July 20, 1990	December 31, 1991

TABLE II-3

SUMMARY OF TEST PARAMETERS

Particulate Matter	EPA Method 5
Visible Emissions	EPA Method 9
Metals:	EPA Method 5 (filter and probe rinse)
Aluminum, Arsenic, Cadmium, Chromium (Total), Lead, Zinc, Barium, Copper, Nickel, Iron, Vanadium	
NO_X	EPA Method 7
Sulfur Dioxide	EPA Method 6 (in back half of Method 5 train)
Carbon Monoxide	EPA Method 10
Volatile Organic Compounds	VOST
Semi-Volatile Organic Compounds	Modified Method 5
CO_2/O_2	EPA Method 3
Stack Gas Flow/Moisture/Temp.	EPA Methods 2 and 4 (in conjunction with EPA Method 5)
PCDDS/PCDFS	EPA Method 23
Polynuclear Aromatic Hydrocarbons	Modified Method 5
Benzene	EPA Method 18
Mercury	EPA Method 101 or 101A

FMMZTIRE

SUPPLEMENTAL INFORMATION: SECTION III

1. Table III-1
   Regulated Emissions Summary

2. Table III-2
   Fuels Summary

3. Table III-3
   Additional Fuels Data

TABLE III-1

REGULATED EMISSIONS SUMMARY

Parameter	Current Allowable Emissions lbs/hr	Current Allowable Emissions T/yr	Allowed Emission Rate Per Rule 17-2	Potential Emissions lbs/hr	Potential Emissions T/yr	Relate to[1] Flow Diagram
Particulate	13.5	55.3	36 lb/hr (17-2.660)	13.5	55.3	E-19
Sulfur Dioxide	11.5	47.0	N/A[2]	11.5	47.0	E-19
Nitrogen Dioxide (NO_x)	162.3	665.3	N/A[2]	162.3	665.3	E-19
Volatile Organic Compounds	7.4	31.2	N/A[2]	7.4	31.2	E-19
Carbon Monoxide	64.0	262.2	N/A[2]	64.0	262.2	E-19
Opacity	10 %	--	20% (17-2.660)	10 %	--	E-19

(1) See Figure V-6.
(2) Allowable emissions for these compounds have been previously established as stated in existing Construction Permit AC 27-173474.

TABLE III-2

FUEL COMBINATION SUMMARY DATA

	Current Fuels		Proposed Fuels	
	Coal	Flolite[1]	Waste Tires	Used Oil
Case 1				
Consumption	24,170 lb/hr	--	0	0
Heat Input (Btu/hr)	3.0×10^8	--	0	0
Portion of Total Fuel Supply (%)	100	--	0	0
Case 2				
Consumption	19,336 lb/hr	--	4286 lb/hr	0
Heat Input (Btu/hr)	2.4×10^8	--	0.6×10^8	0
Portion of Total Fuel Supply (%)	80	--	20	0
Case 3				
Consumption	12,085 lb/hr	--	0	1034 gal/hr
Heat Input (Btu/hr)	1.5×10^8	--	0	1.5×10^8
Portion of Total Fuel Supply (%)	50	--	0	50
Case 4				
Consumption	7251 lb/hr	--	4286 lb/hr	1034 gal/hr
Heat Input (Btu/hr)	0.9 x 108	--	0.6×10^8	1.5×10^8
Portion of Total Fuel Supply (%)	30	--	20	50

1 Flolite will mainly be used during start-up of kiln operations and during periods when raw materials feed is stopped and kiln temperature must be maintained, and flolite is normally used only as a substitute for coal. In cases where flolite and coal are used concurrently, the maximum heat input rate will not exceed 3.0×10^8 Btu/hr.

TABLE III-3
ADDITIONAL FUELS DATA

	Heat Capacity		Sulfur Content[2]
Current:			
Coal	12,500	Btu/lb	1.0 %
Flolite[1]	145,000	Btu/gal	1.0 %
Proposed:			
Used Oil	145,000	Btu/gal	1.5 %
Waste Tires	14,000	Btu/lb	< 1.0 %

(1) Flolite will mainly be used during start-up of kiln operations and during periods when raw materials feed is stopped and kiln temperature must be maintained, and flolite is normally used only as a substitute for coal. In cases where flolite and coal are used concurrently, the maximum heat input rate will not exceed 3.0×10^8 Btu/hr.

(2) Values shown are approximate.

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TABLE III-4

OFF-SPEC USED OIL CHARACTERISTICS*

Arsenic	5 ppm maximum
Cadmium	2 ppm maximum
Chromium	10 ppm maximum
Lead	100 ppm maximum
Flash Point	100° F minimum
Total Halogens	4,000 ppm maximum

* As specified in 40 CFR Part 266.40, "Used Oil Burned For Energy Recovery".

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SUPPLEMENTAL INFORMATION: SECTION V

1. Table V-1
   Process Data (Feed, Production, Heat Input Rates)

2. Emissions Calculations

3. Figure V-1
   Process Flow Diagram

4. Figure V-2
   USGS Topographical Map

5. Figure V-3
   Facility Plot Plan

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TABLE V-1
PROCESS DATA

Kiln Feed Rate	130	T/hr
Clinker Production Rate	79.6	T/hr
Maximum Heat Input	3.0×10^8	Btu/hr

EMISSIONS CALCULATIONS

1. PARTICULATE

The anticipated emissions rate for particulate is the same as the currently permitted level. In order to determine the efficiency of the air pollution control device, the potential emission loading to the baghouse is calculated based on an emissions factor from the EPA Guidance Document AP-42, Table 8.6-1.

Calculation of Allowable Emissions:

Allowable Emissions	= 13.5 lb/hr (Permit AC27-173474)
	= 55.3 T/yr (Permit AC27-173474)

Calculation of Potential Emissions:

Potential Emissions	= 13.5 lb/hr
	= 55.35 T/yr

Calculation of Control Device Removal Efficiency:

Uncontrolled Emissions Factor	= 245.0 lb/ton clinker
Production Rate	= 79.6 T/hr clinker
Potential Emission Loading to Baghouse	= (245 lb/ton) x (79.6 T/hr)
	= 19,502.0 lb/hr
Control Device Removal Efficiency	= (19,502 lb/hr - 13.5 lb/hr) - (19,502 lb/hr)
	= 99.9%

EMISSIONS CALCULATIONS

2. SULFUR DIOXIDE

The anticipated emissions rate for Sulfur Dioxide is the same as the current permitted level. Sulfur Dioxide is generated in the cement kiln from two sources: 1) The minerals present in the raw process feed, and 2) The combustion of fuel. Uncontrolled emissions factors for Sulfur Dioxide, found in the EPA Guidance Document AP-42, are used in calculating the potential loading to the from each source.

Calculation of Allowable Emissions:

Allowable Emissions = 11.5 lb/hr (Permit AC27-173474)

= 47.0 T/yr (Permit AC27-173474)

Calculation of Potential Emissions:

Potential Emissions = 11.5 lb/hr

= 47.0 T/yr

Calculation of System Removal Efficiency:

Mineral Source:

Sulfur Dioxide Emission Factor = 10.2 lb SO_2/ton clinker (from AP-42)

Clinker Production Rate = 79.6 T/hr

Potential Emissions Loading to the Fabric Filter = (79.6 tons clinker/hr) x (10.2 lb SO_2/ton clinker)

= 811.9 lb/hr

Calculation of System Removal Efficiency: (continued)

Fuel Source:

Sulfur dioxide emissions associated with fuels sources of sulfur are minimized through compliance with current permit specific condition No. 4. This condition restricts the sulfur content of the coal currently used to a maximum of 1.0 percent by weight assuming a heating value of 12,387 Btu/lb. Coals with heating values lower than 12,387 Btu/lb are restricted to a maximum of 0.83 pounds of sulfur per MMBtu of heat input. The following analysis is provided to calculate the typical sulfur characteristics of the proposed waste fuels.

Waste Tires:

Heating Value = 14,000 Btu/lb

Sulfur Content = 0.72% (Based on available analytical Data)

Sulfur/Btu Ratio $= \frac{(0.0072 \text{ lb S/lb fuel})}{(0.014 \text{ MMbtu/lb fuel})}$

$= 0.51$ lb S/MMbtu

Used Oil:

Heating Value = 145,000 Btu/lb

API Gravity, 60/60 °F = 30 (Based on available analytical data)

Specific Gravity $= \frac{141,500}{1000\ (30 + 131.5)}$

$= 0.88$

Density $= (0.88) \times (62.3 \text{ lb/ft}^3)$

$= 54.8 \text{ lb/ft}^3$

Sulfur Content = 1.5%

Sulfur/Btu Ratio $= \frac{(0.015 \text{ lb S/lb fuel})}{0.0145 \text{ MMBtu/gal}}$

Sulfur/Btu Ratio $= \frac{(0.015 \text{ lb S/lb fuel}) \times (54.8 \text{ lb fuel/ft}^3)}{(0.145 \text{ MMBtu/gal}) \times (7.48 \text{ gal/ft}^3)}$

$= 0.76$ lb S/MMBtu

This analysis shows that waste tires and used oil do not contain sulfur levels exceeding the maximum criteria for coal. Therefore the use of these fuels should not result in an increase in sulfur dioxide emissions beyond the allowable rate for baseline coal usage. Fuel source emissions of sulfur dioxide are calculated as follows:

Maximum Fuel Consumption Rate = 300 mmBtu/hr

Maximum Fuel Sulfur Content = 0.83 lb/mmBtu

Conversion Factor = 2 lb SO_2/lb S

Potential Emissions Loading to the Fabric Filter
= (300 mmBtu fuel/hr)
x (0.83 lb sulfur/mmBtu fuel)
x (2 lb SO_2/lb S)
= 498 lb/hr SO_2

Total:

Estimated Total Potential Emissions Loading to the Fabric Filter
= 498 lb/hr + 811.9 lb/hr
= 1,310 lb/hr SO_2

System Removal Efficiency = (1,310 lb/hr - 11.5 lb/hr)
÷ (1,310 lb/hr)
= 99.1%

EMISSIONS CALCULATIONS

3. NITROGEN DIOXIDE (NO_X)

Nitrogen Dioxide (NO_X) emissions are a function of the kiln combustion process only. It is assumed that no control is provided by the fabric filter. The anticipated emissions are the same as the current permitted level.

Allowable Emissions	= 162.3 lb/hr NO_X (Permit AC27-173474)
	= 665.3 T/yr (Permit AC27-173474)
Potential Emissions	= 162.3 lb/hr
	= 665.3 T/yr
Control Device Removal Efficiency	= 0%

EMISSIONS CALCULATIONS

4. CARBON MONOXIDE

Carbon Monoxide emissions are a function of the kiln combustion and process reactions only. It is assumed that no control is provided by the fabric filter. The aniticipated emission rate is the same as the current permitted level.

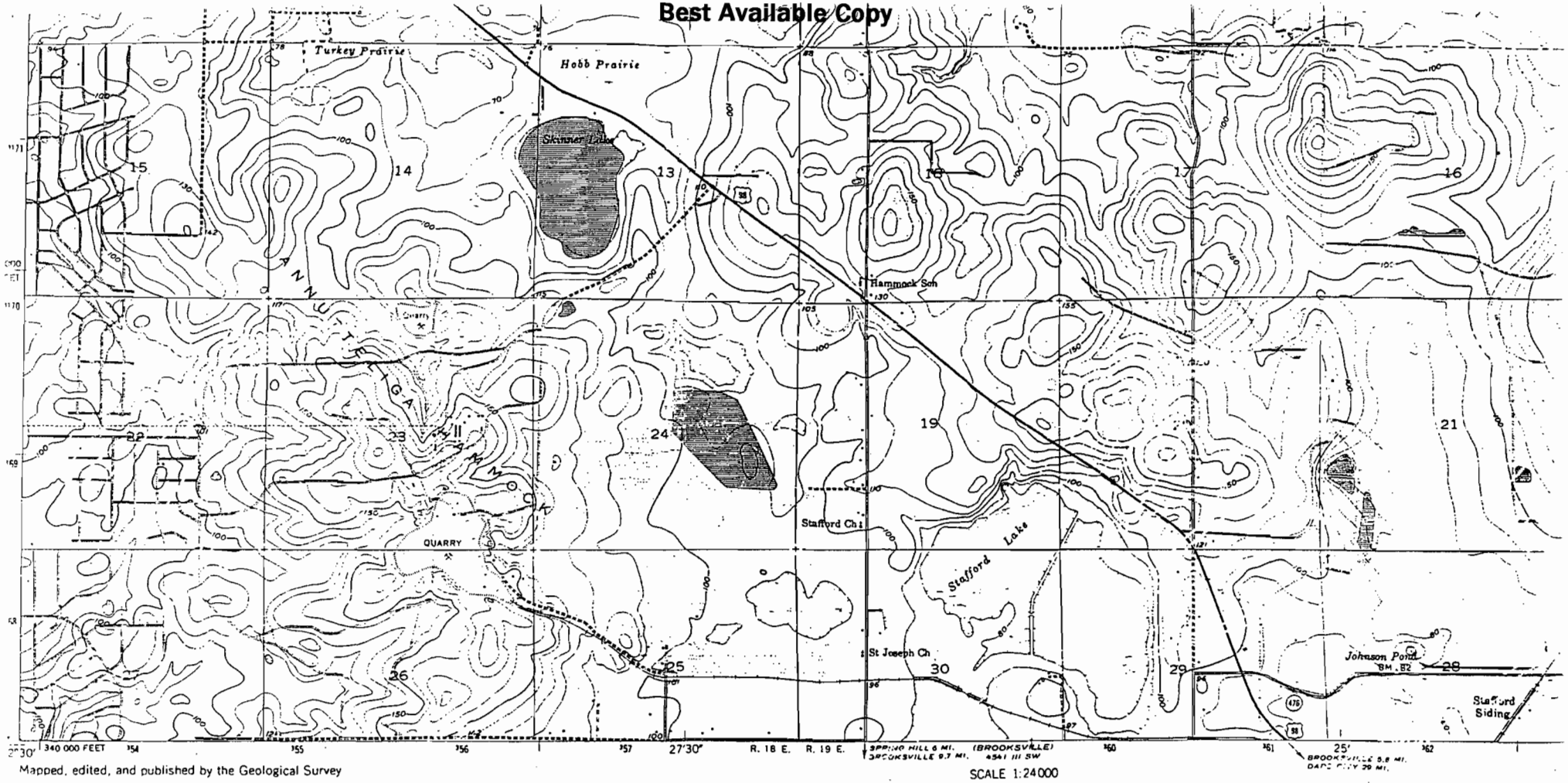
Allowable Emissions	= 64.0 lb/hr (Permit AC27-173474)
	= 262.2 T/yr (Permit AC27-173474)
Estimated Potential Emissions	= 64.0 lb/hr
	= 262.2 T/yr
Control Device Removal Efficiency	= 0%

EMISSIONS CALCULATIONS

5. VOLATILE ORGANIC COMPOUNDS (TOTAL HYDROCARBONS)

Control of volatile organic compounds (hydrocarbons) is achieved through properly maintained combustion conditions within the kiln system. The proposed anticipated rate is the same as the current permitted level.

Allowable Emissions	= 7.4 lb/hr (Permit AC27-173474)
	= 31.2 T/yr (Permit AC27-173474)
Potential Emissions	= 7.4 lb/hr
	= 31.2 T/yr
Control Device Removal Efficiency	= 0%



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Polyconic projection. 1927 North American datum
10,000-foot grid based on Florida coordinate system, west zone
1000-meter Universal Transverse Mercator grid ticks, zone 17, shown in blue

To place on the predicted North American Datum 1983, move the projection lines 27 meters south and 16 meters west as shown by dashed corner ticks
There may be private inholdings within the boundaries of the National or State reservations shown on this map

MN GN
2½° 44 MILS
0°41' 12 MILS
UTM GRID AND 1988 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24000

1 0 1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 5 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

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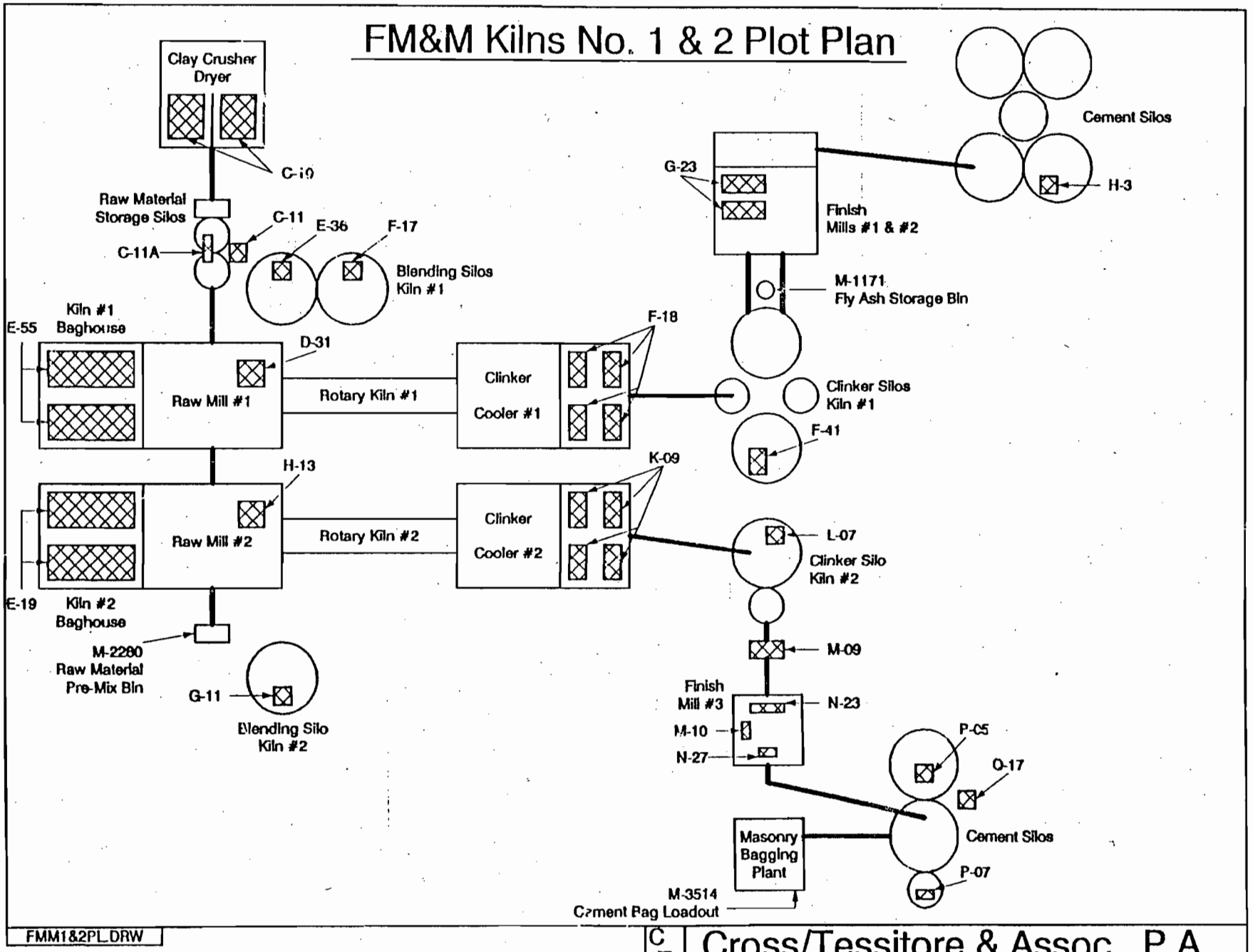
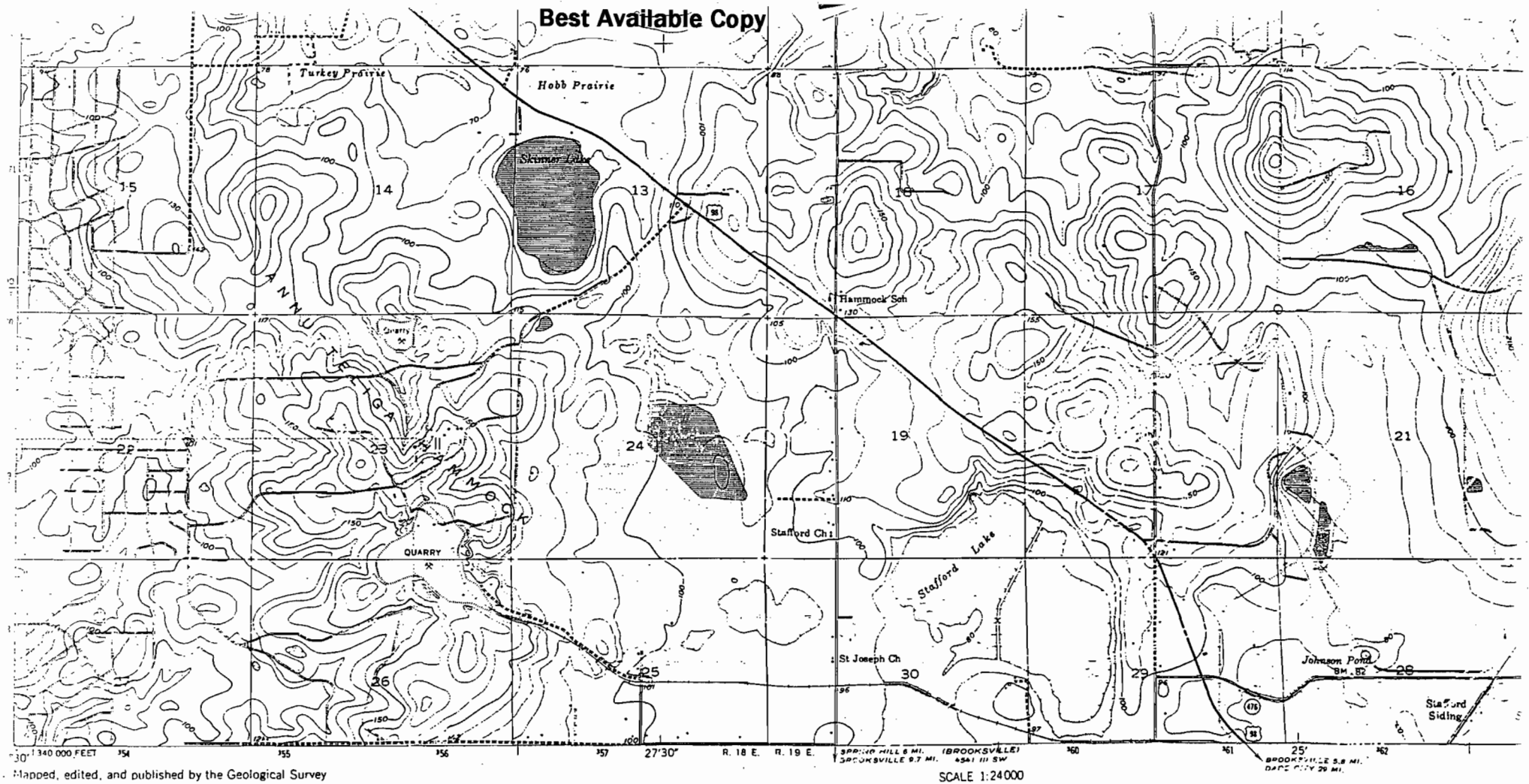
QUADRANGLE LOCATION

Revisions shown in purple compiled from aerial photographs and other sources. This information not field checked. Map e

FIGURE V-3


FM&M Kilns No. 1 & 2 Plot Plan
Clay Crusher Dryer
C-10
Raw Material Storage Silos
C-11
C-11A
E-36
F-17
Blending Silos Kiln #1
Kiln #1 Baghouse
E-55
D-31
Raw Mill #1
Rotary Kiln #1
Clinker Cooler #1
F-18
H-13
Raw Mill #2
Rotary Kiln #2
Clinker Cooler #2
K-09
E-19
Kiln #2 Baghouse
M-2280 Raw Material Pre-Mix Bin
G-11
Blending Silo Kiln #2
G-23
Finish Mills #1 & #2
Cement Silos
H-3
M-1171 Fly Ash Storage Bin
Clinker Silos Kiln #1
F-41
L-07
Clinker Silo Kiln #2
M-09
Finish Mill #3
N-23
M-10
N-27
P-05
O-17
Cement Silos
Masonry Bagging Plant
P-07
M-3514 Cement Bag Loadout
FMM1&2PL.DRW
C T A
Cross/Tessitore & Assoc., P.A.
Environmental Engineers Orlando, Florida



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FLORIDA
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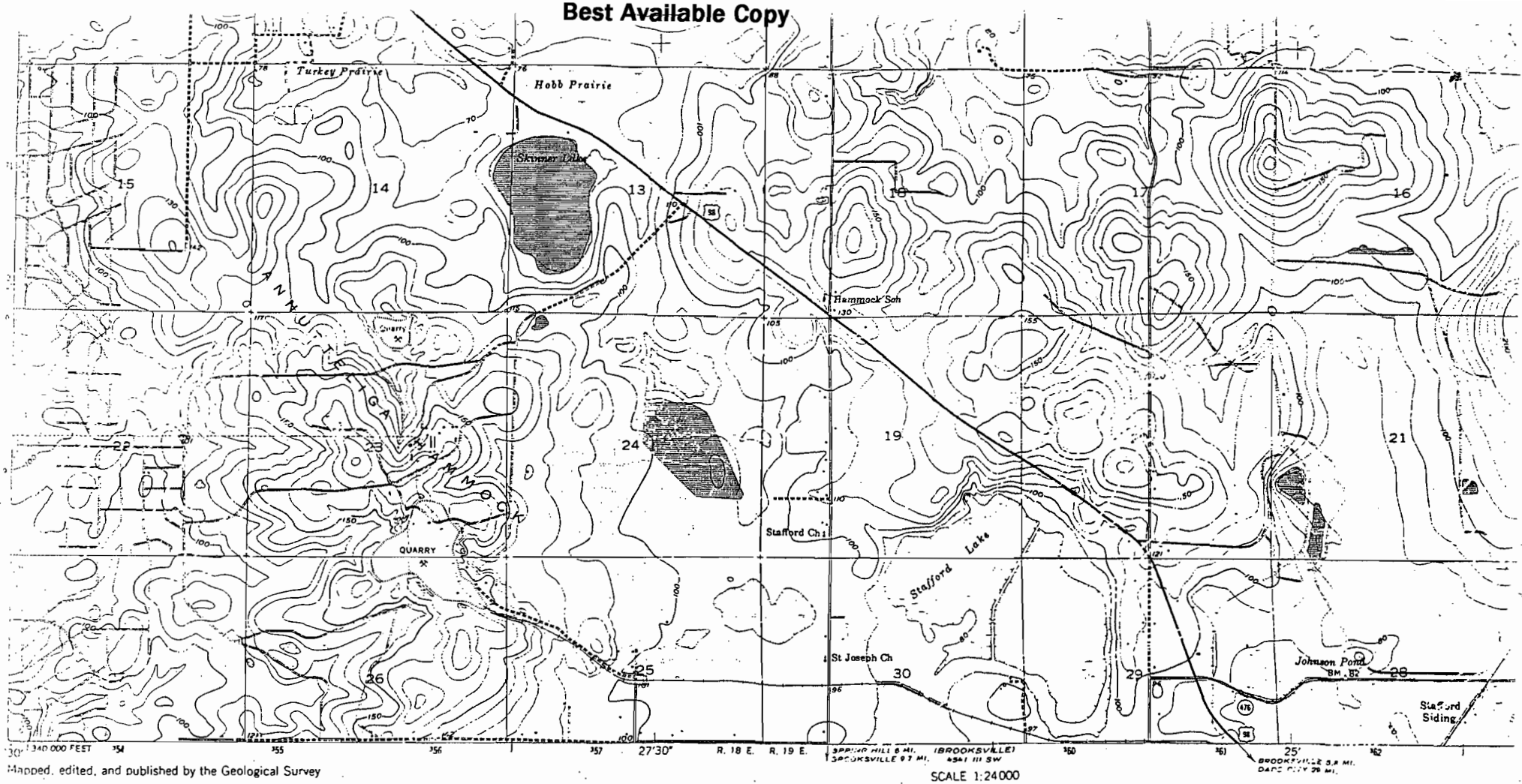

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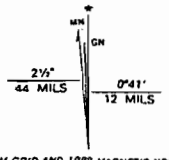

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1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 0 1 KILOMETER

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