SHOLTES & KOOGLER, ENVIRONMENTAL CONSULTANTS
1213 N.W. 6th Street Gainesville, Florida 32601 (904) 377-5822

SKEC 307-82-02

April 14, 1983

Mr.Cleve Holladay
Florida Department of
Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32301

Subject: Florida Crushed Stone Company
Cement Plant/Power Plant
Hernando County, Florida
PSD-FL-090 and FL-091

Dear Cleve:

The attached computer print-outs confirm the information I relayed to you by telephone regarding the impact of fugitive particulate matter emissions from coal handling activities at the proposed Florida Crushed Stone cement plant/power plant in Hernando County, Florida. In addition to the computer print-outs I have summarized the calculations for fugitive particulate matter emission rates from the various activities associated with coal handling and have summarized the results of the air quality modeling. I have also addressed fugitive particulate matter emissions from existing and proposed automobile and truck traffic on the Florida Crushed Stone property. Presently, approximately 600 trucks per day (250 days per year) make round trips to the existing Florida Crushed Stone lime, limerock and limestone plants. Approximately two-thirds of the three-mile round trip is traveled on an unpaved road. Although the addition of the cement plant and power plant will increase both truck and automobile traffic on Florida Crushed Stone property, the paving of the main access road will result in a net reduction in traffic generated fugitive particulate matter emissions.

The fugitive particulate matter emissions from coal handling were calculated using emission factors forwarded to you at an earlier date under cover of a letter from Mr. Larry Curtin of Holland & Knight. The coal handling rates used in conjunction with the emission factors, for the various activities considered, are summarized in the attached material. In all cases, it was assumed that the material handling rates would be uniformly distributed throughout a 24-hour period since particulate matter concentrations are calculated for a 24-hour period and since there is no way of

knowing which hours during a 24-hour period some of the randomly scheduled activities might occur.

In addition to calculating the fugitive particulate matter emission rates, a particle size distribution was assigned to the particles so that particle deposition could be accounted for in the air quality modeling. The size distribution information and the input parameters necessary for the ISC-ST modeling are also included in the attached material.

The impacts of fugitive particulate matter emissions from the six activities associated with coal handling were evaluated using the ISC-ST model. The input to the model included source information for the six activities; meteorological data from Tampa for calendar years 1973, 1974, 1975, 1978 and 1979; and receptors which defined the boundary of the Florida Crushed Stone property. Since the fugitive emitting sources are located at or near ground level, receptors were placed only at the boundary of the Florida Crushed Stone property. No receptors were placed beyond the property line for this initial evaluation.

The results of the ISC-ST modeling are summarized in the attached table. Aside from 24-hour periods when several hours of calm existed, the summary shows the maximum impact of fugitive particulate matter emissions to be 21 micrograms per cubic meter, 24-hour average. The next impact is 19 micrograms per cubic meter, 24-hour average. These impacts occurred on day 230, 1974 and day 190, 1975, respectively.

Based on previous air quality modeling submitted to your office it was determined that the maximum impact of all point sources (new and existing) occurred with meteorology from day 341, 1973. The impact occurring under these meteorological conditions was 32 micrograms per cubic meter, 24-hour average. From the same previously submitted air quality modeling data, the maximum new source particulate matter impact in the vicinity of the Florida Crushed Stone property was determined to be 7 micrograms per cubic meter, 24-hour average.

If the maximum new point source particulate matter impact of 7 micrograms per cubic meter is combined with the maximum fugitive particulate matter impact of 21 micrograms per cubic meter, the resulting impact will be 28 micrograms per cubic meter, 24-hour average. This addition of impacts assumes that the maximum impacts from both types of sources occurred at the same receptor and under the same meteorological conditions. Neither of these conditions occurred. Even with the severe assumptions; however, the resulting

impact is less than 37 micrograms per cubic meter; the allowable 24-hour particulate matter impact for new sources in a Class I PSD Area.

To evaluate the impact of all sources (new, existing and fugitive), emission rates from new and existing point sources and the fugitive sources associated with coal handling were input to the ISC-ST model. The receptor sets input to the model were such that the maximum impact could be located to within 0.1 kilometers. The meteorological data input to the model were for day 341, 1973-the day resulting in the maximum 24-hour particulate matter impact from point sources; and days 230, 1975 and 190, ~~1978~~ 1975 the meteorological conditions resulting in the two highest fugitive particulate matter impacts. The results from these model runs are summarized in the attached figure and include a background particulate matter concentration for the 24-hour period of 112 micrograms per cubic meter.

The maximum impact calculated was 148 micrograms per cubic meter, 24-hour average. This concentration compares with a 24-hour particulate matter air quality standard of 150 micrograms per cubic meter, not to be exceeded more than once per year.

Actions proposed by Florida Crushed Stone will greatly reduce fugitive particulate matter emissions resulting from truck traffic on Florida Crushed Stone property. The attached calculation sheets show that under present conditions, the fugitive particulate matter emission rate resulting from truck traffic on Florida Crushed Stone property is 1,549 tons per year. After the main access road is paved, as proposed by Florida Crushed Stone, the fugitive particulate matter emissions generated by present truck traffic will be 658 tons per year. There will, however, be an increase in fugitive particulate matter emissions resulting from additional truck and automobile traffic generated by the cement plant and the power plant. This traffic will increase fugitive particulate matter emissions by approximately 61 tons per year. When combined with emissions from existing truck traffic (under paved road conditions) of 658 tons per year, the resulting traffic generated fugitive particulate matter emission rate will be 719 tons per year.

Subtracting the expected fugitive particulate matter emissions under paved road conditions, with the power plant and cement plant constructed, from traffic generated fugitive particulate matter emissions under present conditions results in a net reduction in fugitive particulate matter emissions of approximately 830 tons per year. This reduction in fugitive particulate matter emissions was assessed with the ISC-ST model using meteorological conditions representative of day 190, 1975. The road system was simulated by 28 volume sources as suggested in the ISC-ST users manual and

particle size data were input to account for particle deposition. The model results showed a negative particulate matter impact in the order of 100-200 micrograms per cubic meter, 24-hour average, at the Florida Crushed Stone property line. Without pursuing this matter further, it is apparent that the reduction in fugitive particulate matter emissions resulting from the road paving will more than offset the impact of increased emissions resulting from coal handling.

If you have any questions regarding this information, please feel free to give me a call.

Very truly yours,

SHOLTES & KOOGLER,
ENVIRONMENTAL CONSULTANTS, INC.

John B. Koogler, Ph.D., P.E.

JBK:sc
Attachments

cc: Mr. Richard C. Entorf
Mr. Larry Curtin

Calculation of Coal Handling Fugitive Particulate Matter Emissions

Unloading from Train

65 cars x 100 tons/car = 6500 tons max for 1 day

x 0.06 lb P.M./ton* x 1/24 $\frac{day}{hr}$ x 0.126 $\frac{g/sec}{lb/hr}$

= 2.04 gr/sec

Loading onto Coal Pile (from train car dump area)

Activity 7 days/week ; 469,000 tons coal/year

469,000 tons/yr x 1/365 $\frac{yr}{day}$ = 1285 tons/day

x 0.000 lb PM/ton* x 1/24 x 0.126

= 0.05 gr/sec or 0.8×10^{-5} gr/sec/m^2 over 80x80 meter area

Transfer to Coal Bin

Long-term daily average transfer rate will equal the coal consumption rate in the power plant + cement plant; or 60 tons/hour

60 tons/hour x 0.02 lb PM/ton* x 0.126

= 0.15 gr/sec

Vehicle Traffic around Pile

Assume 1285 tons/day

x 0.027 lb P.M./ton* x 1/24 x 0.126

= 0.18 gr/sec or 2.8×10^{-5} gr/sec/m^2 over 80x80 meter area

Loadout From Pile

60 tons/hr (same as transfer to coal bin)

x 0.007 lb P.M./ton* x 0.126

= 0.05 g/sec

Wind Erosion

Assume 1285 tons/day

x 0.001 lb/ton* x 1/24 x 0.126

= 0.01 gr/sec or 0.2×10^{-5} gr/sec/m^2 over 80x80 meter area

* Emission Factors previously submitted to FDER

Source Input Data To ISC-ST
For Fugitive P.M. Emissions From Coal Handling

Source	Emission Rate (g/sec or g/sec/m²)	Location		Ht	Point Source			Area Source
		X (km)	Y (km)	(m)	Temp (°K)	Vel (m/s)	Dia (m)	Dimension (m)
Unloading	2.04	360.22	3162.54	15	314	1.0	1.0	—
Loadout	0.05	360.14	3162.54	10	314	1.0	1.0	—
Coal Bin	0.15	360.01	3162.57	15	314	1.0	1.0	—
Load to Pile	0.8×10^{-5}	360.14	3162.51	10	—	—	—	80
Traffic	2.8×10^{-5}	360.14	3162.51	10	—	—	—	80
Wind	0.2×10^{-5}	360.14	3162.51	10	—	—	—	80

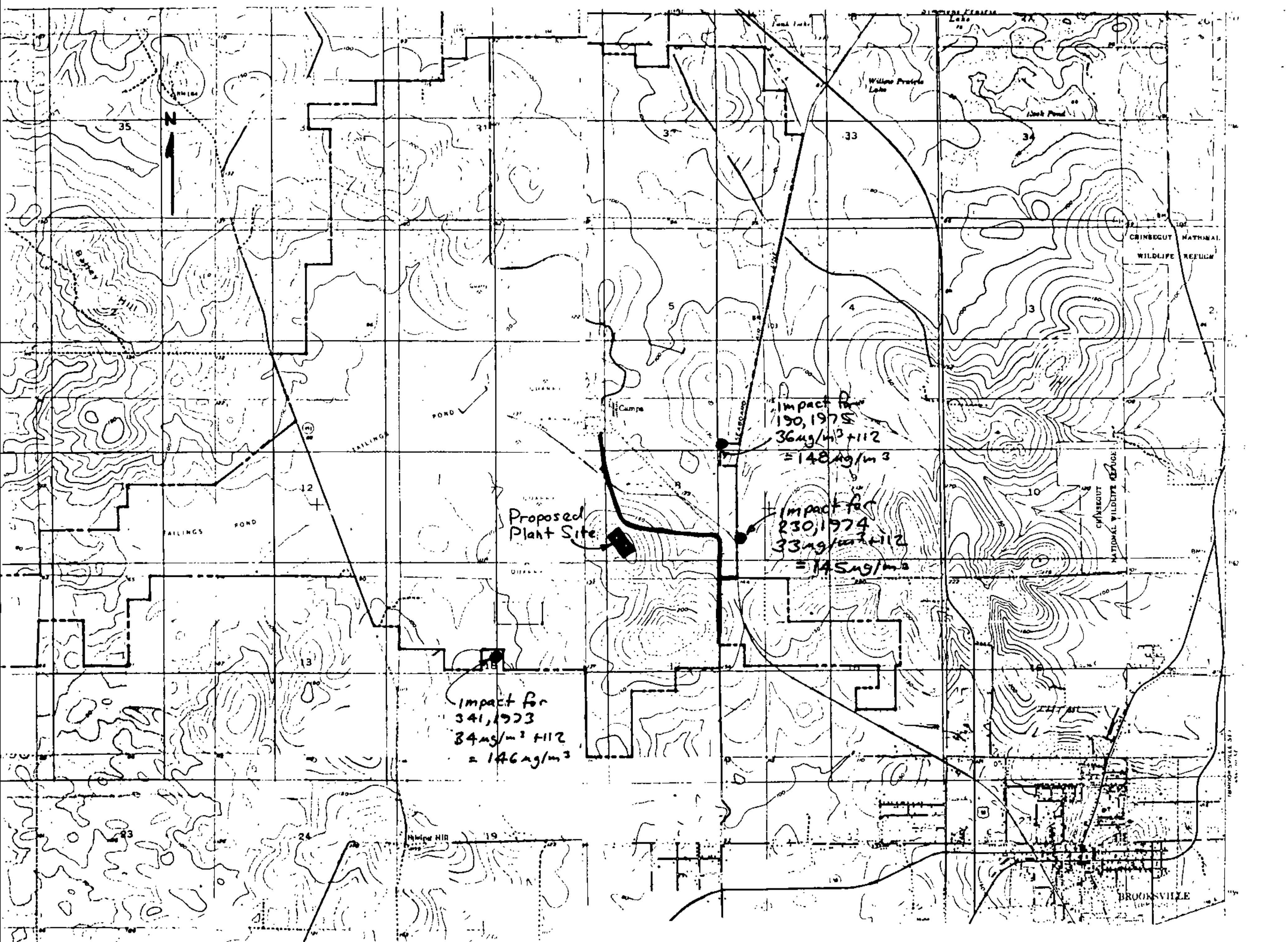
Size Distribution Data For Coal Pile Fugitive P.M. Emissions

Assume all particles < 75 μm

Size Range (μm)	Fraction in Range	Settling Vel (m/sec)	Reflection Coeff.
75-38	0.817	0.150	0.37
37-19	0.163	0.038	0.65
18-10	0.018	0.009	0.78
<10	0.002	0.002	0.87

Summary of ISC-ST Modeling Results to Assess Impact of Coal Handling Fugitive P.M. Emissions — 5 Years of Tampa Met Data

Year	24-Hr Impact ($\mu g/m^3$)	Day	Comment
1973	14.5	210	
1974	20.7	230	one hour of calm affecting receptor - USE
	13.9	045	
1975	21.2	350	14 hours of calm
	19.1	190	no calms — USE
1978	13.1	136	
1979	16.6	275	C hours of calm
	16.2	080	6 hours of calm
	15.1	069	3 hours of calm



N
Willow Prairie Lake
CHINSEGUT NATIONAL WILDLIFE REFUGE
Camps
TAILINGS POND
TAILINGS POND
Impact for
190,1975
36ug/m3 +112
=148 ug/m3
Impact for
230,1974
33ug/m3 +112
=145ug/m3
Proposed
Plant Site
Impact for
341,1973
34ug/m3 +112
= 146 ug/m3
CHINSEGUT NATIONAL WILDLIFE REFUGE
BROOKSVILLE

TRAFFIC GENERATED FUGITIVE P.M. EMISSIONS

PRESENT

600 trucks/day
250 days/year
21 tons avg wt.
Round-trip travel - 3.0 miles (2 miles unpaved; 1 mile paved)

Assume:
Silt Content = 8% (paved & unpaved)
Speed = 20 mph
Dust on paved road surface = 9000 lb/mile
Number of dry days = 258 (Tampa)

Emission Factors & Rates: (1)

Paved Road

$$E = 0.45 \left(\frac{8}{10}\right)\left(\frac{9000}{5000}\right)\left(\frac{21}{3}\right)^{0.8}$$
$$= 3.07 \text{ lb/VMT}$$

$$R = 3.07 \times 600 \text{ truck/day} \times 250 \text{ day/yr} \times 1 \text{ mile} \times 1/2000 \text{ ton/lb}$$

$$= 230 \text{ tons/year}$$

Unpaved Road

$$E = 5.9 \left(\frac{8}{12}\right)\left(\frac{20}{30}\right)\left(\frac{21}{3}\right)^{0.8}\left(\frac{258}{365}\right)$$
$$= 8.79 \text{ lb/VMT}$$

$$R = 8.79 \times 600 \times 250 \times 2 \text{ miles} \times 1/2000$$
$$= 1319 \text{ tons/year}$$

Total Present = 230 + 1319
= 1549 tpy

(1) See attached Mid-West Research Institute reference

PROPOSED

1. From Existing traffic – Same traffic load as for "present" conditions

Assume:

Travel 2.75 miles on paved road
Travel 0.25 miles on unpaved road
Silt = 8% (paved & unpaved)
Speed = 20 mph
Dust on paved road surface = 7000 lb/mile
Number of dry days = 258

Emissions (1):

Paved Road

$$R = 0.45\left(\frac{8}{10}\right)\left(\frac{2000}{5000}\right)\left(\frac{21}{3}\right)^{0.8} \times 600 \times 250 \times 2.75 \text{ miles} \times 1/2000$$

$$= 493 \text{ tons/yr}$$

Unpaved Road

$$R = 5.9\left(\frac{8}{12}\right)\left(\frac{20}{30}\right)\left(\frac{21}{3}\right)^{0.8}\left(\frac{258}{365}\right) \times 600 \times 250 \times 0.25 \text{ miles} \times 1/2000$$

$$= 165 \text{ tons/yr}$$

2. Proposed Traffic

Assume:

Truck traffic = 41,600 miles/yr over 250 days
Auto traffic = 50,000 miles/year over 350 days
All traffic travels 2 miles on paved road.
Truck wt = 21 tons
Auto wt = 2.5 tons
Dust on road surface = 7000 lb/mile
Silt = 8%

Emissions (1):

Truck

$$R = 0.45\left(\frac{8}{10}\right)\left(\frac{7000}{5000}\right)\left(\frac{21}{3}\right)^{0.8} \times 41,600 \times 1/2000$$

$$= 50 \text{ tons/yr}$$

Auto

$$R = 0.45\left(\frac{8}{10}\right)\left(\frac{2000}{5000}\right)\left(\frac{2.5}{3}\right)^{0.8} \times 50,000 \times 1/2000$$

$$= 11 \text{ tons/year}$$

J. Total Proposed Emissions

Exist Truck	= 493 + 165
Proposed Truck	= 50
Proposed Auto	= 11
	719 tons/year

NET CHANGE

Present	1549 tpy	
Proposed	719 tpy	
Change	(830 tpy)	reduction in traffic generated fugitive P.M. emissions due to road paving.

EPA-600/2-78-050
March 1978

FUGITIVE EMISSIONS FROM INTEGRATED IRON AND STEEL PLANTS

by

Russel Bohn, Thomas Cuscino Jr.,
and Chatten Cowherd Jr.

Midwest Research Institute
425 Volker Boulevard
Kansas City, Missouri 64110

Contract No. 68-02-2120
ROAP 21AUY-060
Program Element No. 1AB015

EPA Project Officer: Robert V. Hendriks

Industrial Environmental Research Laboratory
Office of Energy, Minerals and Industry
Research Triangle Park, N.C. 27711

Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Research and Development
Washington, D.C. 20460

OPEN DUST SOURCE: Vehicular Traffic on Paved Roads
QA RATING: B for Normal Urban Traffic
C for Industrial Plant Traffic*

$$EF = 0.45 \left(\frac{s}{10}\right)\left(\frac{L}{5000}\right)\left(\frac{W}{3}\right)^{0.8} \text{ lb/veh-mi}$$

Determined by profiling of emissions from traffic (mostly light-duty) on arterial roadways with values for s and L assumed.

Assumed by analogy to experimentally determined factor for unpaved roads.

Determined by profiling of emissions from light-duty vehicles on roadway which was artificially loaded with known quantities of gravel fines and pulverized topsoil.

*Tests of industrial plant traffic yielded higher than predicted emissions, presumably due to resuspension of dust from vehicle underbodies.

where: EF = suspended particulate emissions (lb/veh-mi)
s = silt content of road surface material (%)
S = average vehicle speed (mph)
W = average vehicle weight (tons)
L = surface dust loading on traveled portion of road (lb/mile)

Figure 3-5. Predictive emission factor equation for vehicular traffic on paved roads.

OPEN DUST SOURCE: Vehicular Traffic on Unpaved Roads
QA RATING: B for Dry Conditions
C for Annual Average Conditions

$$EF = 5.9 \left(\frac{s}{12}\right)\left(\frac{S}{30}\right)\left(\frac{W}{3}\right)^{0.8}\left(\frac{d}{365}\right) \text{ lb/veh-mi}$$

Determined by profiling of emissions from light-duty vehicles on gravel and dirt roads under dry conditions.

Estimated factor to account for mitigating effects of precipitation over period of one year.

Determined by profiling of emissions from medium- and heavy-duty vehicles on gravel and dirt roads under dry conditions.

where: EF = suspended particulate emissions (lb/veh-mi)
s = silt content of road surface material (%)
S = average vehicle speed (mph)
W = average vehicle weight (tons)
d = dry days per year

Figure 3-4. Predictive emission factor equation for vehicular traffic on unpaved roads.

FLORIDA CRUSHED STONE COMPANY

April 1, 1983

DER

APR 04 1983

BAQM

Mr. Bob King
Engineer
Florida Dept. of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32301

Dear Mr. King:

This letter is in response to your telephone request today. Our cement plant equipment supplier and process engineer, Polysius Corporation, tested three different samples of our limestone fines raw material in 1982. Each of the three samples had an SO_3 content of .05%.

Our specific calculations of expected SO_2 emissions from the cement kiln are:

Raw Material

.05% SO_3 x 75 TPH clinker x 1.55 raw feed to clinker ratio x 2000 #/ton x 90% of raw feed

= 105#/HR SO_3 x $\frac{64}{80}$

= 84 #/HR SO_2

Fuel

0.75% S x 10.3 TPH coal x 2000#/ton

= 155#/HR S x 2

= 310#/HR SO_2

Total

84#/HR from raw materials
310#/HR from fuel
394#/HR Total

394#/HR at 80% absorbtion = 80#/HR SO_2 emmissions

POST OFFICE BOX 300 / LEESBURG, FLORIDA 32748 / PHONE (904) 787-0608

I trust this is all the information you need on this subject.

Regards,

Richard C. Entorf
Senior Vice President

RCE:se

cc: John Koogler
Skip Haskell

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

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

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

March 30, 1983

Richard Entorf
Senior Vice-President
Florida Crushed Stone Company
P. O. Box 317
Leesburg, Florida 32748

Dear Mr. Entorf:

RE: Cement Plant/Power Plant, Brooksville, Florida
PSD-FL-090 and FL-091

The department has received the attached letter from the Fish and Wildlife Service of the U. S. Department of the Interior containing comments regarding your PSD permit applications, PSD-FL-090 and FL-091. While these comments do not affect any completeness determination by the department, we are obligated by 40 CFR 52.21 to consider any comments the federal land manager makes before issuing your permits. We would advise you to contact the Fish and Wildlife Service to obtain information about the flora, fauna and soils in the Chassahowitzka Class I area and to find out what they would like you to do in reference to the cumulative effects analysis they mention in paragraph three of their letter.

Sincerely,

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

CHF/CH/ks

Enclosure

cc: Robert E. Putz, U.S. Fish and Wildlife Service
Dan Williams, DER Southwest District

SHOLTES & KOOGLER, ENVIRONMENTAL CONSULTANTS
1213 N.W. 6th Street Gainesville, Florida 32601 (904) 377-5822

SKEC 307-82-02

March 29, 1983

DER

MAR 30 1983

BAQM

Mr. Clair H. Fancy
Florida Department of
Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32301

Subject: Florida Crushed Stone Company
Hernando County, Florida
Cement Plant-AC27-16016 and PSD-FL-090
Power Plant-PSD-FL-091

Dear Mr. Fancy:

The information contained herein is in response to your letter of March 18, 1983 to Mr. Richard Entorf of the Florida Crushed Stone Company. In that letter you raised some questions regarding gas flow rates and gas temperatures that were addressed in my letter of February 24, 1983 to Mr. Larry Curtin; a copy of which was sent to you. You also requested that information requested in your letter of March 10, 1983 addressing the air quality review prepared for the power plant siting application be submitted directly to you so that you could continue processing the State Air Pollution Source Construction Permit for the cement plant and the Federal PSD Permit Applications for the proposed cement plant and power plant.

Cement Plant and Power Plant Gas Flow Diagrams

1. The clinker cooler exhausts shown in the two attached flow diagrams are at two different temperatures; 1650 degrees F and 410 degrees F. The reason for these two temperatures is that the two gas streams are taken from the clinker cooler at different points. The 1650 degree gas stream is withdrawn from the clinker cooler near the feed end of the cooler where the 2200-2300 degree clinker has heated the cooling gas to this temperature. The 410 degree gas stream is withdrawn from the cooler near the discharge end of the cooler.

2. The response to Items 2 and 3 of your March 18, 1983 letter can be answered by referring to the revised flow diagrams attached hereto. Regarding your second

question, there was an error on the flow sheet showing the gas flow with the cement plant only operating. This has been corrected on the attached flow diagram. Regarding your third question, the revised flow diagrams show the input and output temperatures to each piece of equipment and show the material feed rate to each piece of equipment.

Air Quality Review

A copy of my letter dated March 18, 1983 to Mr. Larry Curtin, a copy of which was forwarded to you,addessed the matters relating to the air quality review addressed in your letter of March 11, 1983. Another copy of that letter is attached hereto.

If you have any other questions regarding any of the subject permit applications, we would appreciate it if you will relay the questions to us by telephone and follow the verbal request by letter. This method of correspondence will enable us to provide you with any additional information you might need as expeditiously as possible.

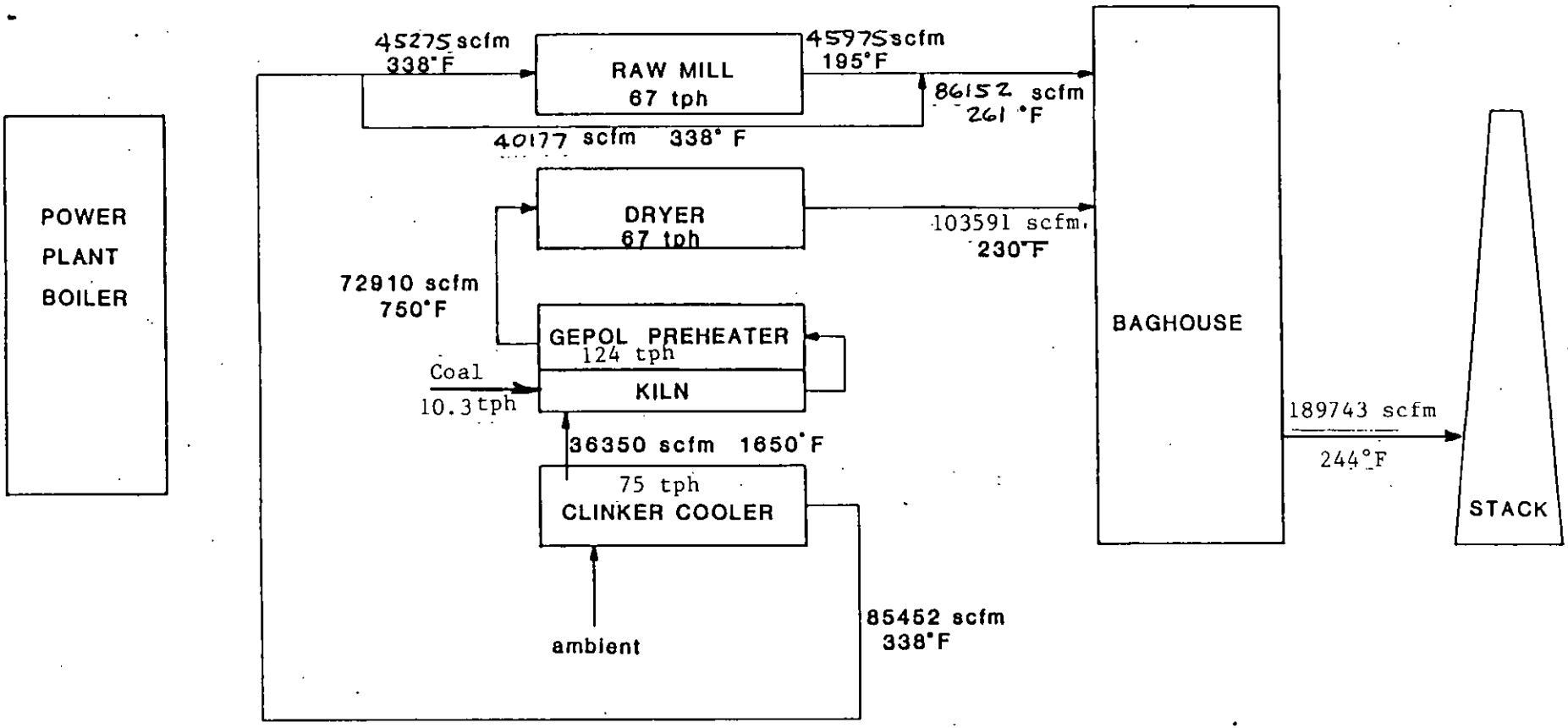
Very truly yours,

SHOLTES & KOOGLER,
ENVIRONMENTAL CONSULTANTS, INC.

John B. Koogler, Ph.D., P.E.

JBK:sc
Attachments

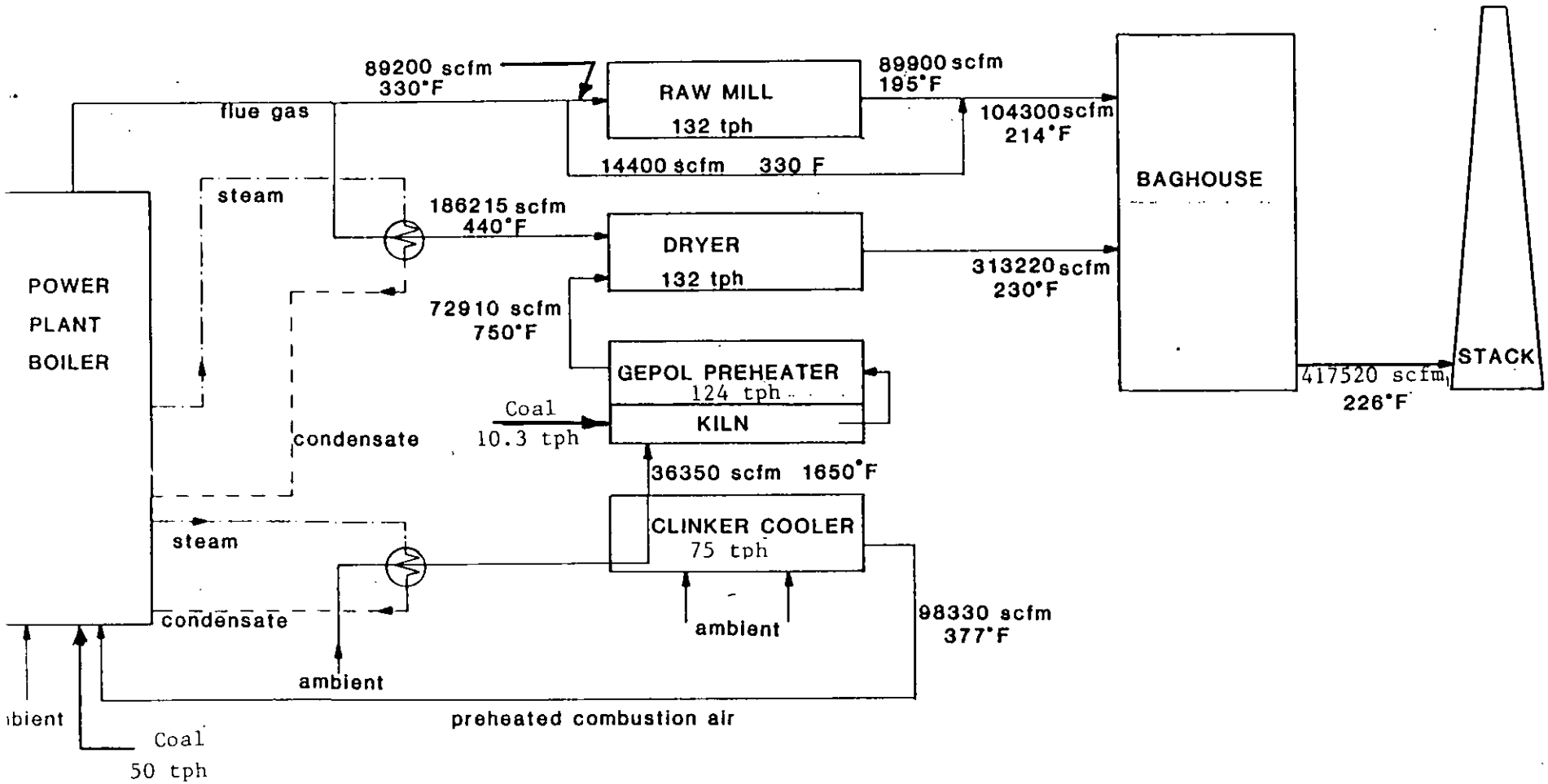
cc: Mr. Richard C. Entorf
Mr. Larry Curtin



POWER PLANT NOT OPERATING/CEMENT PLANT OPERATING

Florida Crushed Stone Company
P.O. Box 317
Leesburg, Fla. 32748

3-23-83
3-29-83



POWER PLANT OPERATING/CEMENT PLANT OPERATING

P.O. Box 317 Florida Crushed Stone Company Leesburg, Fla. 32748

3-23-83
3-29-83

ATTACHMENT 12

SHOLTES & KOOGLER, ENVIRONMENTAL CONSULTANTS
1213 N.W. 6th Street Gainesville, Florida 32601 (904) 377-5822

SKEC 307-82-02

DER

MAR 21 1983

BAQM

March 18, 1983

Mr. Larry Curtin
Holland & Knight
92 Lake Wire Drive
Lakeland, Florida 33802

Subject: Florida Crushed Stone Company
Proposed Cement Plant/Power Plant
Hernando County, Florida

Dear Larry,

The enclosed information has been developed in response to Buck Oven's letter of March 11, 1983 to Dick Entorf and to supplement the material I provided to you under cover of my letter of February 24, 1983. The information is related to the air quality review which has been prepared to evaluate the impact of the proposed Florida Crushed Stone cement plant/power plant on ambient air quality.

In my letter to you of February 24, 1983, I provided revised information showing the impact of the proposed cement plant/power plant on the Chassahowitzka Class I PSD area. The information was based on meteorological data for calendar years 1973, 1974, 1975, 1979 and 1981. Meteorological data for calendar year 1978 were not included in the air quality review at that time because a portion of the data had not been received from the National Clamatic Center in Asheville, North Carolina.

Subsequent to that time, we received the mixing height data for calendar year 1978 and have evaluated the impact of sulfur dioxide and particulate matter emissions from the proposed cement plant/power plant on the Chassahowitska Class I PSD area using these meteorological data. The impact of the proposed Florida Crushed Stone sources, under 1978 meteorological conditions, are summarized in Table 1. Also, included in Table 1 are the data which were included in my February 24 letter.

A review of these data show that the sources proposed by Florida Crushed Stone can be constructed without causing or contributing to a violation of the Class I PSD increments for either sulfur dioxide or particulate matter. The maximum sulfur dioxide impacts at the Class I PSD area for all new sources in the vicinity of the Florida Crushed Stone site are 0.7 micrograms per cubic meter, annual average; 4.7 micrograms per cubic meter, 24-hour average; and 20.1 micrograms per cubic meter, 3-hour average. These impacts compared with allowable Class I sulfur dioxide increments of 2.0 micrograms per cubic meter, annual average; 5.0 micrograms per cubic meter, 24-hour average; and 25.0 micrograms per cubic meter, 3-hour average.

The maximum particulate matter impacts at the Class I area boundary from all new sources in the vicinity of the proposed Florida Crushed Stone site are 0.4 micrograms per cubic meter, annual average, and 1.8 micrograms per cubic meter, 24-hour average. These impacts compare with allowable Class I PSD increments for particulate matter of 5.0 micrograms per cubic meter, annual average and 10.0 micrograms per cubic meter, 24-hour average. It should be noted that particulate matter emissions from some of the smaller bag collectors in the proposed Florida Crushed Stone cement plant have been modified slightly since this portion of the air quality review was completed. The overall emission rates from the affected sources change by less than 0.5 percent, however. This slight change in emission rate is not expected to have an effect on the predicted impacts of particualte matter emissions on the Class I area.

The impact of Florida Crushed Stone emissions on the Class I PSD area calculated with 1978 meteorological data plus the Class I PSD impact analyses that I provided under cover of my letter of February 24, 1983 completely updates the Class I area air quality review that you provided FDER under cover of your letter dated December 27, 1982. The current impact analyses also reflect the latest changes in source emission data and correct the inconsistencies in the 1975 and 1978 meteorological data.

In addition to revising the Class I PSD area air quality review, the Class II PSD air quality review has also been revised to take into consideration the changes in particulate matter emissions from several sources in the proposed cement plant and to use meteorological data for the periods 1973, 1974, 1975, 1978 and 1979 from Tampa, Florida. The use of these meteorological data make the air quality review for the Class II PSD area consistent with the air quality review conducted for the Class I PSD area.

In addition to these revisions, the air quality review for particulate matter is now based on actual emissions from two major existing particulate matter emitting sources in the Hernando County area. These are the Chemical Lime Company which is totally owned by Florida Crushed Stone and the existing particulate matter sources at the Florida Mining and Materials Company cement plant.

The Chemical Lime Company operates a lime kiln, a hydrator, a limestone dryer and a lime bagging plant. The present FDER operating permits, the allowable particulate matter emission rate and the actual particulate matter emission rates associated with these sources are:

		Particulate Matter (lb/hr)	
Source	Permit	Allowable	Actual
Kiln	A027-55581	21.7	18.0
Hydrator	A027-25269	14.0	14.0
Dryer	A027-50400	33.3	16.0
Bagging	A027-17352	12.0	6.0

The Chemical Lime Company is willing to modify the operating permits for these sources to reflect the actual emission rates used in this air quality review if required by FDER.

Particulate matter emission rates from existing Florida Mining and Materials sources were similarly reduced to reflect actual emissions. This was done so that the air quality review results would more realistically represent ambient particulate matter concentrations in the vicinity of the Florida Mining and Material plant. The original air quality review conducted for Florida Crushed Stone indicated an annual average of particulate matter concentration near the Florida Mining and Materials plant of 59 micrograms per cubic meter; compared with an air quality standard of 60 micrograms per cubic meter. Unreported short-term modeling in the vicinity of Florida Mining and Materials further indicated that the 24-hour air quality standard of 150 micrograms per cubic meter would be exceeded if the existing particulate matter sources were emitting at the permitted emission rates.

The Florida Mining and Materials sources for which emission rates were modified, the source permit numbers and the emission rates allowed by permit, the emission rates reported to FDER and emission rates used in the modeling are:

Source	Particulate Matter (lb/hr)			
	Permit	Allowable	Actual	Modeled
Raw Materials Storage	A027-31412	37.0	1.3	2.6
Raw Materials Gnd.	A027-31411	37.0	1.0	2.6
Kiln	A027-20213	36.9	26.2	36.9
Cooler	A027-41208	34.2	12.0	24.0
Clinker Gnd.	A027-31410	36.0	6.4	12.6
Bottom Blend	A027-31413	37.0	1.0	5.0
Clinker Silo	A027-31409	34.2	1.7	1.7
Clay Crush	A027-31408	26.4	2.1	5.0
Product Storage	A027-31406	34.2	1.3	5.0

The revised particulate matter emission data from the Florida Crushed Stone sources, the "actual" particulate matter emission rates from the Chemical Lime and Florida Mining and Materials sources, meteorological data from the period 1973 through 1979 from Tampa, Florida and emission rates particulate matter and sulfur dioxide or other sources in the area as used in the previous air quality review were used as input to the ISC-ST model to evaluate the impact of new and existing sources on ambient air quality. A preliminary receptor grid was used with this model to determine the location of the maximum particulate matter and sulfur dioxide impacts for all 3-hour and 24-hour time periods from the Florida Crushed Stone sources, from all new sources and from all sources (new plus existing sources). The preliminary receptor grid used in the modelling is shown in Figure 1.

The results of the air quality modeling were reviewed and the second highest particulate matter and sulfur dioxide impacts for all time periods and source groups were selected. These impacts are summarized in the bound volume of modeling results. From this summary, the highest second-high of particulate matter impacts from various source groups for the 24-hour period were selected and the highest second-high sulfur dioxide impacts for the 3-hour and 24-hour periods from various source groups were selected. The meteorological data resulting in these impacts were again input into

the ISC-ST model with a receptor grid which would allow the determination of the maximum impact within 0.1 kilometers. The results of this modeling are summarized in Table 2 and Figures 2 and 3.

The short-term modeling results indicate that the sulfur dioxide emissions from the Florida Crushed Stone sources and all new sources combined are well below the Class II PSD increments for both the 3-hour and the 24-hour period. The modeling also shows that the sulfur dioxide emissions from the proposed Florida Crushed Stone sources, when combined with all other new and existing sulfur dioxide emitting sources in the area result in maximum 3-hour and 24-hour ambient impacts which are well below the 3-hour and 24-hour sulfur dioxide air quality standards.

The results of the short-term particulate matter modeling show that the 24-hour particulate matter impact of emissions from the proposed Florida Crushed Stone sources is 6 micrograms per cubic meter. This is approximately half the impact reported in the previous air quality review and is a result of a reduction in the proposed particulate matter emissions from the proposed cement plant. The impact of the proposed Florida Crushed Stone emissions combined with particulate matter emissions from other new sources in the area result in a maximum 24-hour impact of 7 micrograms per cubic meter compared with an allowable Class II PSD incremental impact of 37 micrograms per cubic meter. The impact of all particulate matter emitting sources in the area (new and existing) is 144 micrograms per cubic meter compared with a 24-hour air quality standard of 150 micrograms per cubic meter. This impact includes a background particulate matter concentration of 112 micrograms per cubic meter and reflects actual particulate matter emissions from the Chemical Lime Company sources and the existing Florida Mining and Materials sources.

The annual average impacts of sulfur dioxide and particulate matter emissions were determined with the ISC-LT model. Meteorological data for calendar years 1973, 1974, 1975, 1978 and 1979 were summarized in the STAR format with six stability classifications for use in this model. The sulfur dioxide and particulate matter emission rates as used in the short-term modeling were input to the model with a receptor grid covering a 15 x 15 kilometer area. Receptor spacings of 1.0 kilometers were used. The results of this modeling are summarized in Table 2 and Figures 4 through 9.

The results of the long-term modeling show that the impact of sulfur dioxide emissions from all new sources is 6 micrograms per cubic meter compared with a Class II PSD increment of 20 micrograms per cubic meter. The maximum annual average impact of all existing

sources in the area is 20 micrograms per cubic meter and the maximum impact of all sources (new and existing) is 22 micrograms per cubic meter. This impact compares with an annual sulfur dioxide ambient air quality standard of 60 microgrms per cubic meter. The maximum annual average impact of sulfur dioxide emissions from the proposed Florida Crushed Stone source, as determined from the ISC-ST model, is 1.8 micrograms per cubic meter.

The long-term modeling of particulate matter emissions shows a new source impact of 2 micrograms per cubic meter compared with an annual Class II PSD increment for particulate matter of 19 micrograms per cubic meter. The maximum impact of all existing sources in the area is 50 micrograms per cubic meter including a background concentration of 34 micrograms per cubic meter. The maximum annual particulate matter impact of all sources (new plus existing) is 51 micrograms per cubic meter including a background of 34 micrograms per cubic meter. This impact compares with an annual average of particulate matter air quality standard of 60 micrograms per cubic meter. The maximum annual impact of particulate matter emissions from proposed Florida Crushed Stone sources, as determined by the ISC-ST model, is 0.7 micrograms per cubic meter.

One matter that was raised by FDER during the review of the air quality modeling was the impact of emissions at the Deltona site. The Deltona Corporation operates an asphalt batching plant on property leased from Florida Crushed Stone. FDER stated that this property might be considered property to which "the general public" has access and ask that the impact of the emissions be evaluated at this point. The modeling results show that the maximum annual sulfur dioxide impact at this source is 10 micrograms per cubic meter; the maximum 24-hour impact is 60 micrograms per cubic meter and the maximum 3-hour impact is 91 micrograms per cubic meter. These impacts result from emissions from all sources in the area and are well below applicable ambient air quality standards.

The maximum annual particulate matter impact from all sources at the Deltona site is 38 micrograms per cubic meter including a background concentration of 34 micrograms per cubic meter and the maximum 24-hour concentration at the site is 142 micrograms per cubic meter including the background concentration of 112 micrograms per cubic meter. Both of these impacts are below the air quality standards for particulate matter. The new source particulate matter impact for the 24-hour period at the Deltona site is 5 micrograms per cubic meter which is well below the Class II PSD increment for particulate matter of 37 micrograms per cubic meter.

In the March 10 letter to Florida Crushed Stone, FDER also asked for socioeconomic information related to possible limits on development in Hernando County as a result of the consumption of air quality and PSD increments. This request resulted from predicted 24-hour average and annual average of particulate matter impacts being near the air quality standards and the projected 24-hour sulfur dioxide impact of the Class I area being close to the allowable Class I PSD increment. The revised particulate matter modeling presented herein, incorporating reduced emission rates from the Florida Crushed Stone sources and actual particulate matter emissions from the Chemical Lime Company sources and existing Florida Mining and Materials mining sources, indicates there is a reasonable increment remaining between maximum 24-hour and annual average particulate matter impacts and the applicable air quality standards. The modeling shows that there is a 6 micrograms per cubic meter increment between the maximum 24-hour impact of 144 micrograms per cubic meter and the 24-hour particulate matter air quality standard of 150 micrograms per cubic meter. Considering the fact that the maximum 24-hour particulate matter impact from the cement plant/power plant proposed by Florida Crushed Stone is 6 micrograms per cubic meter, one could conclude that an identical facility could be built at the same site without exceeding the 24-hour air quality standard for particulate matter of 150 micrograms per cubic meter. Since such a facility can be constructed at the same site without violating the 24-hour particulate matter air quality standard, it is reasonable to assume that projects of equal size or larger could reasonable be constructed anywhere in the vicinity of the proposed Florida Crushed Stone site without violating the 24-hour particulate matter air quality standard.

A similar argument can be presented for the annual average particulate matter standard. The increment of between the maximum predicted annual average particulate matter impact of 51 micrograms per cubic meter and the annual average particulate matter air quality standards of 60 micrograms per cubic meter is nine micrograms per cubic meter. In contrast, the maximum annual average impact of emissions from the proposed Florida Crushed Stone complex is less than one microgram per cubic meter. It is apparent that several sources of the size of the proposed Florida Crushed Stone facility can be constructed in the vicinity of the Florida Crushed Stone site without threatening the annual average particulate matter standard.

The maximum sulfur dioxide impacts of all sources, for all time periods are well below the applicable air quality standards and the sulfur dioxide impacts of all new sources on the Class II area are well below applicable Class II PSD increments for all time periods. Additionally, the annual and 24-hour impact of new particulate

matter sources are well below the Class I and Class II PSD increments. From this it can be concluded that sulfur dioxide air quality standards, Class II PSD area sulfur dioxide increments and Class I and II PSD area particulate matter increments will not limit growth and development in the Hernando County area.

New source sulfur dioxide emissions from the Hernando County area on the Chassahowitzka Class I PSD area represent the greatest potential for limiting sulfur dioxide emitting developments in Hernando County. An adequate portion of the annual Class I area PSD increment will remain even after the construction of the proposed Florida Crushed Stone sources. The maximum annual impact of new souce sulfur dioxide emissions on the Class I PSD area is 0.7 micrograms per cubic meter compared with an annual Class I PSD sulfur dioxide increment of 2 micrograms per cubic meter. As a point of reference, the maximum annual impact of sulfur dioxide emissions from the proposed Florida Crushed Stone cement plant/power plant is 0.6 micrograms per cubic meter. This indicates that two additional facilities, with sulfur dioxide emissions equal to the proposed Florida Crushed Stone facility, can be built in the immediate vicinity of the Florida Crushed Stone site without violating the annual Class I PSD area sulfur dioxide increment.

The 3-hour impact of sulfur dioxide emissions from all new sources on the Class I PSD area is 20.1 micrograms per cubic meter compared with a Class I increment of 25 micrograms per cubic meter. The maximum 3-hour impact of the Florida Crushed Stone facility on the Class I area is 18.2 micrograms per cubic meter; 1 microgram per cubic meter from the cement plant and 17.2 micrograms per cubic meter from the power plant. From these data, it can be deduced that a source with a stack height of approximately 300 feet and a sulfur dioxide emission rate of approximately 400 pounds per hour can be built in the vicinity of the Florida Crushed Stone site without exceeding the 3-hour sulfur dioxide Class I PSD increment. Sources with a greater emission rates or sources with lower emission rates and also a lower stack heights can be constructed north, east or south of the Florida Crushed Stone site without exceeding the 3-hour Class I PSD increment for sulfur dioxide. Sources constructed west of the proposed Florida Crushed Stone site will be limited to sulfur dioxide emission rates of less than 400 pounds per hour with a stack height of 300 feet or some combination of higher emissions and a higher stack height or lower emissions and a lower stack height. As a point of reference, the sulfur dioxide emission rate from the proposed Florida Crushed Stone cement plant is 80.0 pounds per hour.

The maximum 24-hour impact of all new sulfur dioxide emitting sources on the Class I PSD area is 4.7 micrograms per cubic meter. This compares with Class I 24-hour sulfur dioxide impact increment of 5.0 micrograms per cubic meter and results with winds blowing from an easterly direction. The 0.3 microgram per cubic meter increment remaining will result in some limitation on the construction of sources to the east and west of the proposed Florida Crushed Stone site. A facility locating adjacent to the Florida Crushed Stone site with a 300 foot stack would be limited to a sulfur dioxide emission rate of approximately 95 pounds per hour. With a 200 foot stack height, the facility would be limited to a sulfur dioxide emission rate of approximately 50 pounds per hour; with a 100 foot stack, the sulfur dioxide emission rate would be limited to approximately 40 pounds per hour; and with a 50 foot stack height, the sulfur dioxide emission rate would be limited to approximately 30 pounds per hour. Sources locating west of the Florida Crushed Stone site will be more limited in sulfur dioxide emissions while sources locating east of the Florida Crushed Stone site will be able to have a greter sulfur dioxide emission rate. Also, sources which operate 8 to 12 hours per day will be able to have sulfur dioxide emission rates two to three times the emission rates stated above. This is a result of averaging into the 24-hour period hours when the source would not be operating and the more favorable meteorological dispersion conditions which exist during the daylight hours.

To place in ~~prospective~~ perspective the emission rates stated in the above paragraph, the proposed Florida Crushed Stone cement plant has a sulfur dioxide emission rate of 80 pounds per hour. The Florida Mining and Materials cement plant kilns have emission rates of less than 10 pounds per hour. A 200 tons per hour asphalt batching plant will have a sulfur dioxide emission rate of approximately 80 pounds per hour. A source with an allowable sulfur dioxide emission rate of 100 pounds per hour will be capable of generating approximately 80 million BTU's per hour of heat. This translates, in terms of electric power, to approximately a 8 megawatts of electric power output.

The source emission limits considered in the above paragraphs are for sources locating to the east or west of the Florida Crushed Stone site. For sources locating north or south of the Florida Crushed Stone site, emission limitations will be less restricted. It has been estimated, using the Class I PSD area impact modeling conducted for Florida Crushed Stone, that a source locating approximately five miles to the north or south of Florida Crushed Stone will be able to have a sulfur dioxide emission rate of approximately 250 pounds per hour without the combined new source sulfur dioxide impact exceeding 5.0 micrograms per cubic meter in the Class I area or a 24-hour period. Again, sources locating to

the east of Florida Crushed Stone as well as north or south will be able to have greater emissions while sources locating to the west as well as north or south will be more restircted in sulfur dioxide emissions. The 250 pounds per hour emission rate is referenced to a 300 foot stack height. With a 200 foot stack height, the sulfur dioxide emission rate would be limited to approximately 125 pounds per hour, with a 100 foot stack, to approximately 100 pounds per hour; and with a 50 foot stack, to approximately 80 pounds per hour.

The socioeconomic analysis provided herein has demonstrated that there will be a limited restriction on new sources of sulfur dioxide proposing to locate in certain areas of Hernando County. The analyses further demonstrates that this limitation will apply to rather large sources of sulfur dioxide emissions operating 24-hours per day. Sources locating five or more miles to the north or south of the Florida Crushed Stone site will be able to have sulfur dioxide emission rates of up to 100 pounds per hour with stack heights of 50 to 75 feet and emission rates of up to 250 pounds per hour with stack heights of 300 feet. Taking into consideration, the Best Available Control Technology requirements imposed by the Florida Department of Environmental Regulation on new sources and the Class I PSD increments increments remaining for sulfur dioxide and particulate matter for the various time periods, it can be concluded that very few, if any, sources will actually be prevented from locating in Hernando County.

The items presented herein have addressed the issues raised in the FDER letter of March 10, 1983 and other matters which I have discussed with the FDER staff. If you have any questions regarding this information or feel additional response is required, please give me a call.

Very truly yours,

SHOLTES & KOOGLER
ENVIRONMENTAL CONSULTANTS, INC.

John B. Koogler, P.h.D., P.E.

JBK:ldh
Enclosures

cc: Mr. Clair Fancy (with enclosures)
Mr. Richard Entorf (with enclosures)

TABLE 1

SUMMARY OF NEW SOURCE IMPACTS
ON CLASS I PSD AREAS

FLORIDA CRUSHED STONE COMPANY
HERNANDO COUNTY, FLORIDA

	Sulfur Dioxide Impact (ug/m^3)					
	Annual		24-Hour		3-Hour	
Year	FCS	All New	FCS	All New	FCS	All New
1973	0.6	0.6	4.1	4.4	17.5	19.1
1974	0.6	0.7	4.1	4.3	17.3 17.4	17.6
1975	0.6	0.7 0.7	4.7	4.7 4.7	18.1 20.2	20.1 20
*1978	0.5	0.6	4.1	4.1	18.2	18.2
1979	0.5	0.6	4.4	4.7	15.4	16.6
1981	0.5	0.5	3.5	3.6	16.4	16.4

	Particulate Matter Impact (ug/m^3)			
	Annual		24-Hour	
Year	FCS	All New	FCS	All New
1973	0.1	0.4	1.0	1.8
1974	0.1	0.3	0.9	1.5
1975	0.1	0.3	0.8	1.5
*1978	0.1	0.3	0.9	1.8
1979	0.1	0.3	0.8	1.3
1981	0.1	0.3	0.8	1.6

Model: ISC-ST
Met Data: Tampa/Tampa
Years - 1973, 74, 75, 78, 79, 81 (1976, 77 & 80 not available)
Data pre-processed with FDER program

*Added 3/16/83

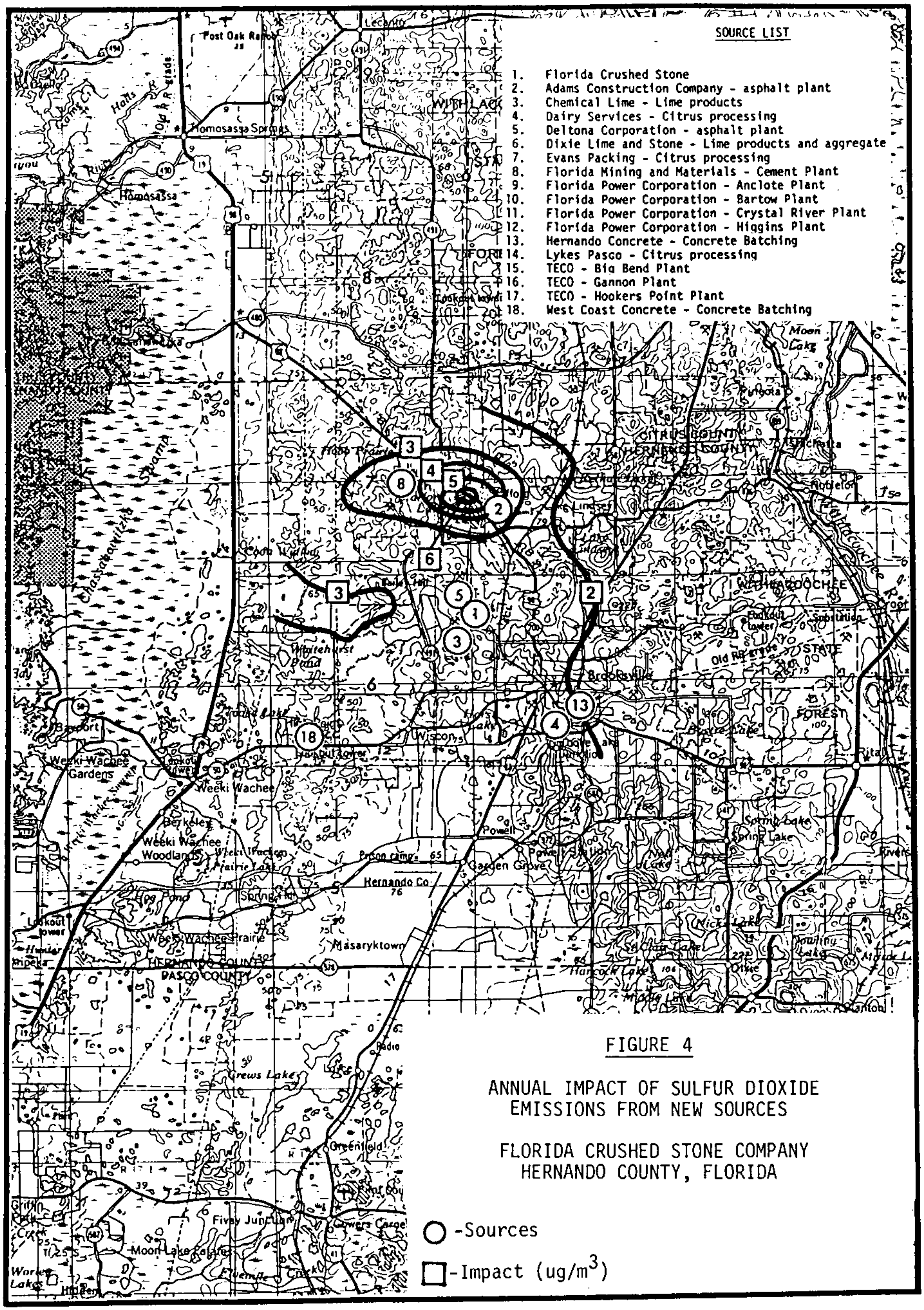


FIGURE 4

ANNUAL IMPACT OF SULFUR DIOXIDE EMISSIONS FROM NEW SOURCES

FLORIDA CRUSHED STONE COMPANY
HERNANDO COUNTY, FLORIDA

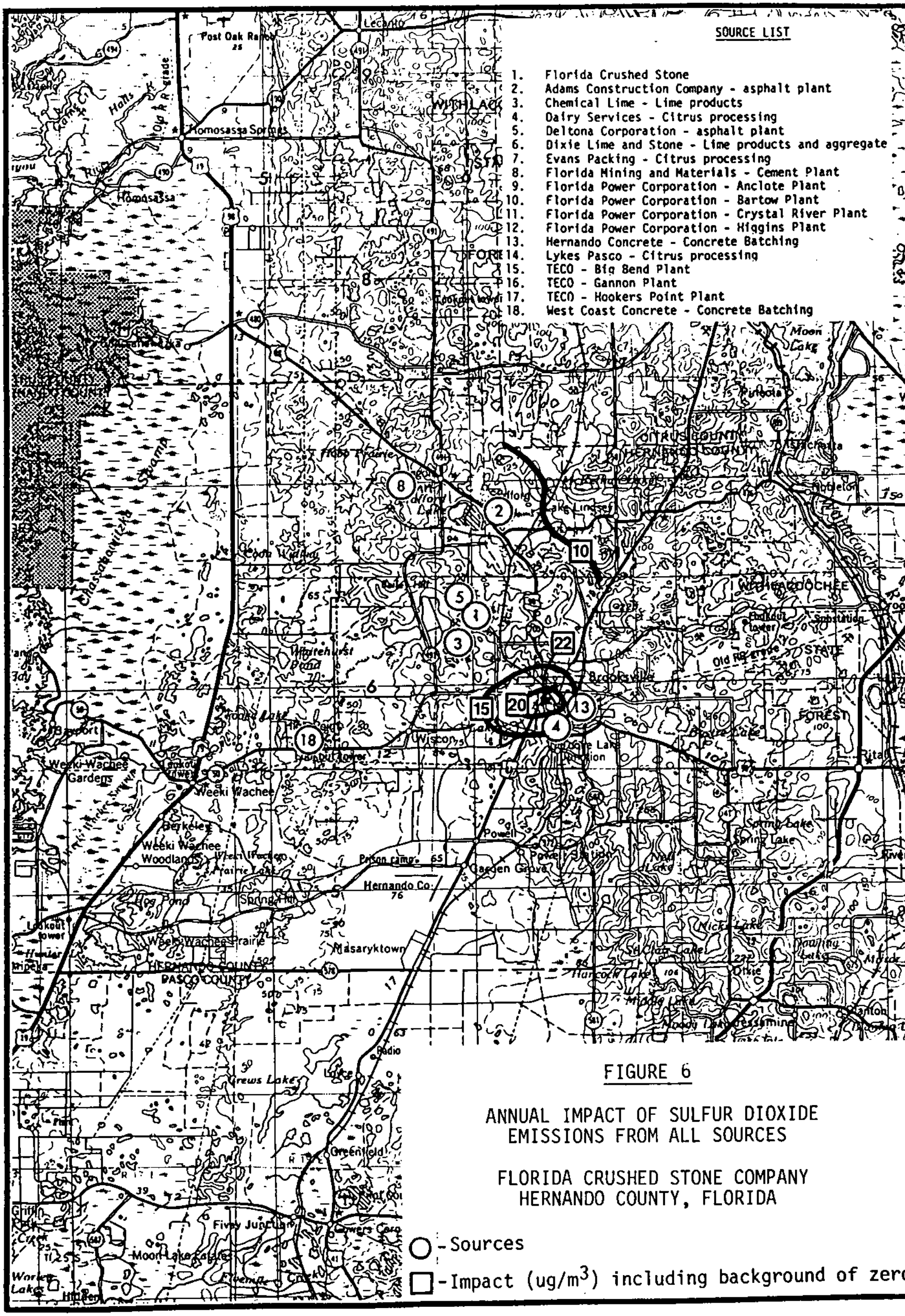


FIGURE 6

ANNUAL IMPACT OF SULFUR DIOXIDE EMISSIONS FROM ALL SOURCES

FLORIDA CRUSHED STONE COMPANY
HERNANDO COUNTY, FLORIDA

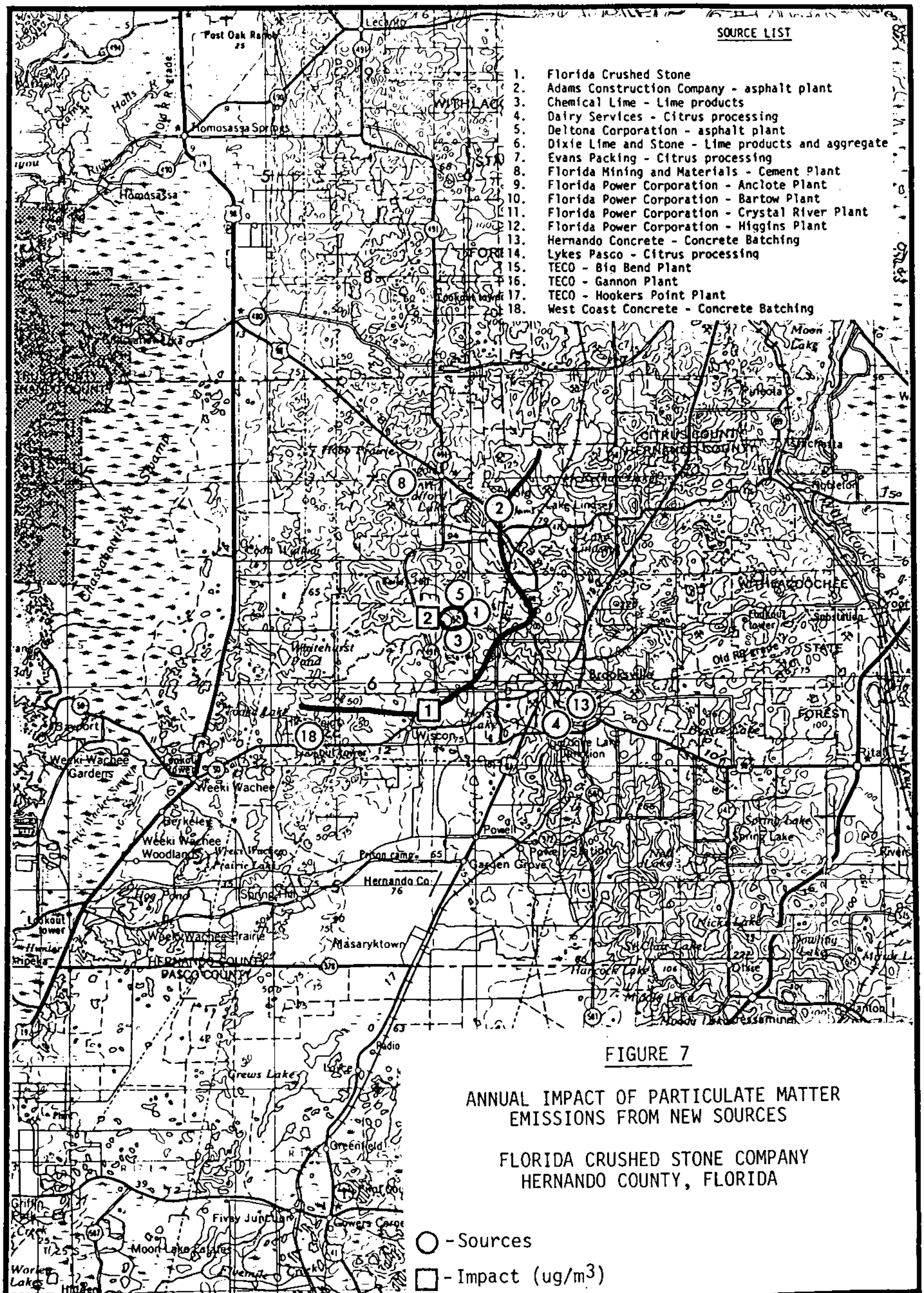


FIGURE 7

ANNUAL IMPACT OF PARTICULATE MATTER EMISSIONS FROM NEW SOURCES

FLORIDA CRUSHED STONE COMPANY
HERNANDO COUNTY, FLORIDA

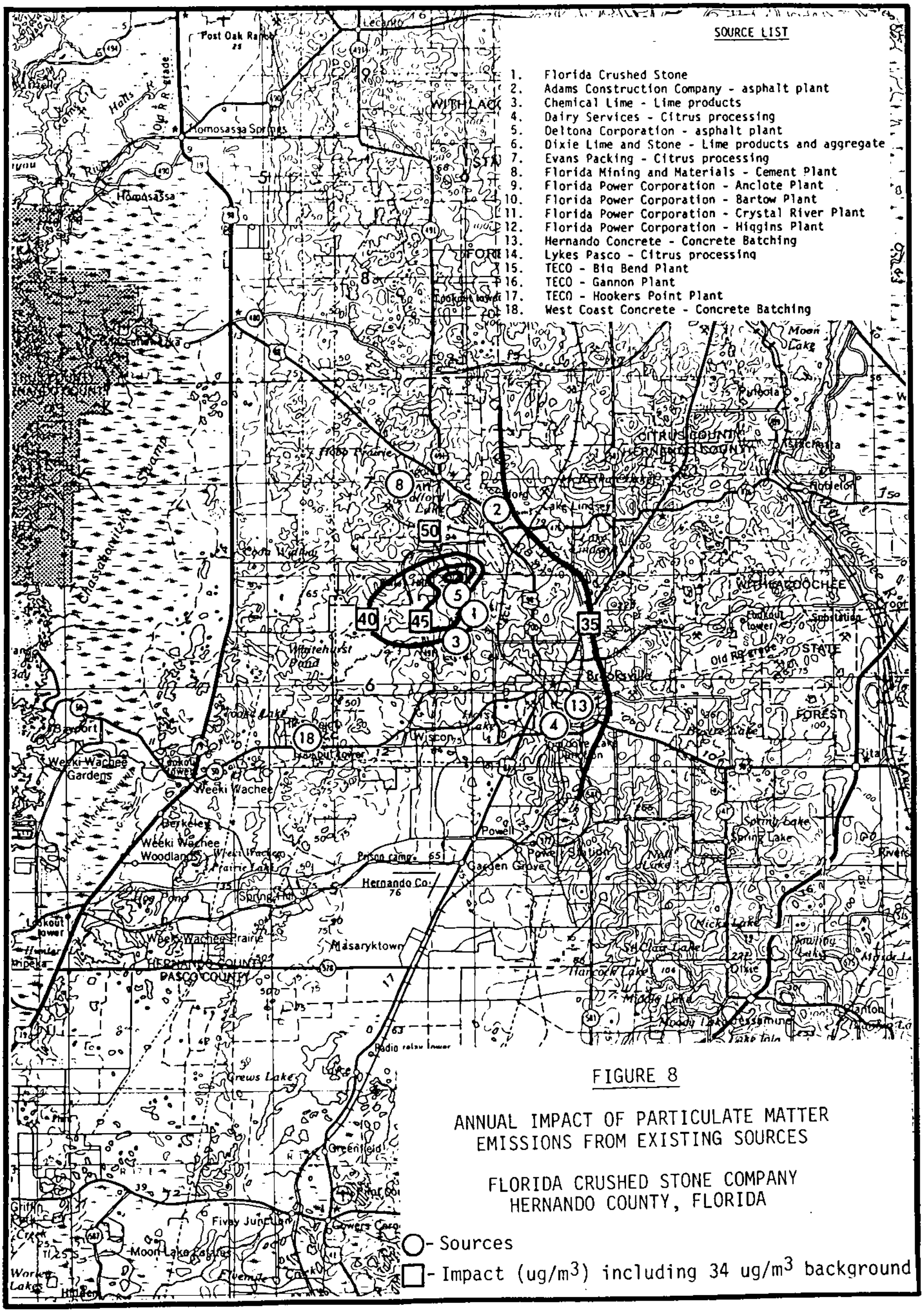


FIGURE 8

ANNUAL IMPACT OF PARTICULATE MATTER EMISSIONS FROM EXISTING SOURCES

FLORIDA CRUSHED STONE COMPANY
HERNANDO COUNTY, FLORIDA

SHOLTES & KOOGLER

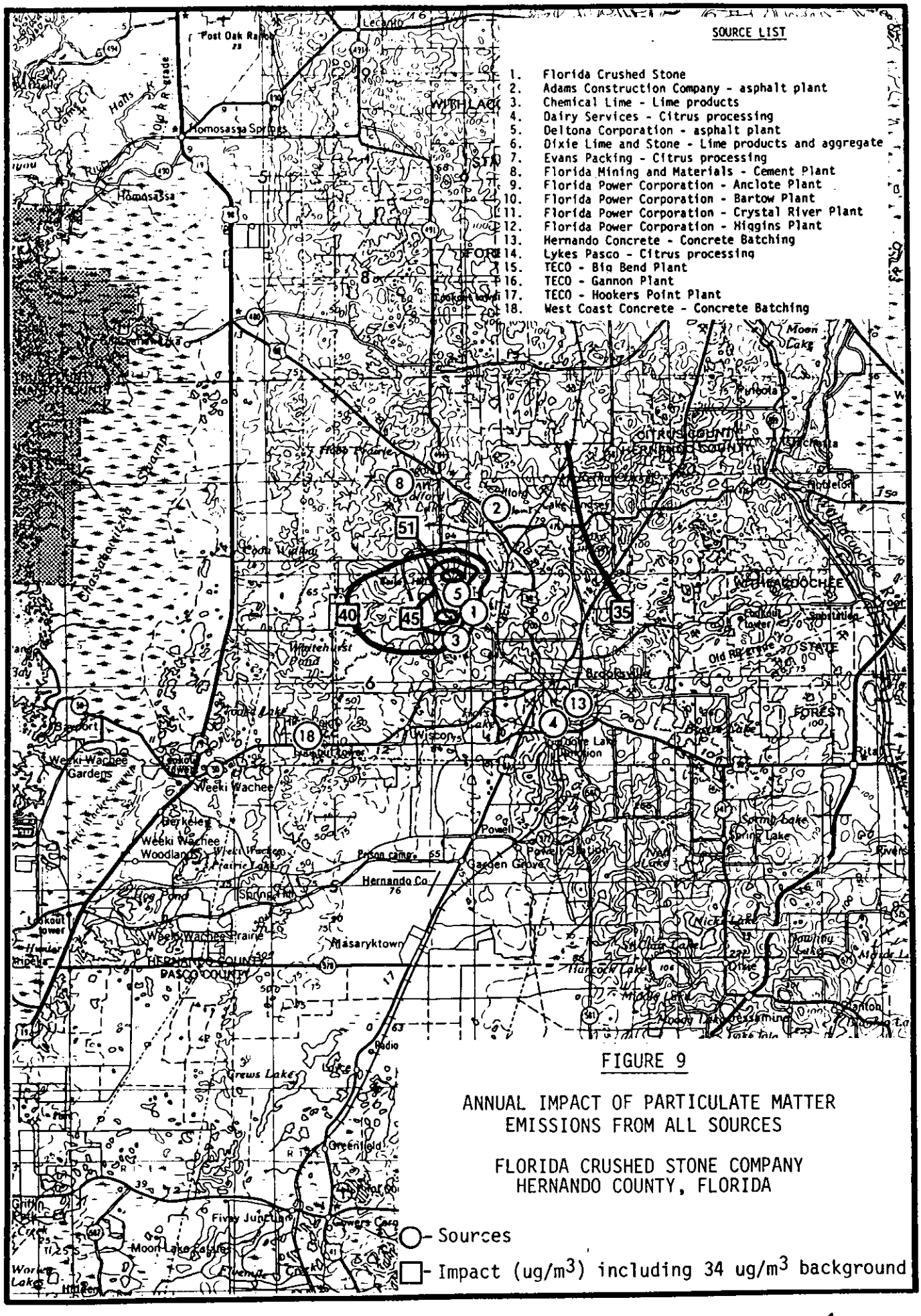


FIGURE 9

ANNUAL IMPACT OF PARTICULATE MATTER EMISSIONS FROM ALL SOURCES

FLORIDA CRUSHED STONE COMPANY
HERNANDO COUNTY, FLORIDA

SHOLTES & KOOGLER

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

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

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

March 18, 1983

CERTIFIED MAIL

Mr. Richard Entorf
Senior Vice-President
Florida Crushed Stone Company
P. O. Box 317
Leesburg, Florida 32748

Subject: Cement Plant, AC 27-16016, etc., Brooksville, Florida
Cement Plant/Power Plant, PSD-FL-090 and FL-091

Dear Mr. Entorf:

The Department has received the revised applications of February 16, 1983, concerning your permit applications for all sources associated with your proposed cement plant. We also received additional information (SKEC 307-82-02), the letter to Larry Curtin from John Koogler dated February 24, 1983.

After reviewing your revised applications and additional information, we have some questions on the revised flow diagrams:

1. Why does the clinker cooler exhaust have two different temperatures, 410°F and 1650°F?

2. The temperature of raw mill by-pass gases is 338°F and the temperature of clinker cooler exhaust to raw mill is 410°F on the flow chart of cement plant operation only. What is the reason the temperature drops from 410°F to 338°F?

3. Comparing the two revised flow diagrams, we have some questions on the input and output temperature balance for some equipment. Please give detailed energy balances for each piece of equipment--raw mill, dryer, kiln and cooler. Submit all the input and output temperatures of each piece of equipment under two conditions: cement plant operating only, and cement plant operating with power plant operating.

Also contained in the letter from John Koogler dated February 24, 1983, was information responding to questions the Department had asked him by telephone concerning the impact of emissions from the combined cement plant/power plant on the Chassahowitzka Class I PSD area. The Department sent a letter to you on March 10, 1983, formally requesting that a response to these questions be provided as part of the power plant siting application for this project. In that letter we also stated that we had found inaccuracies in the meteorological data used to analyze the impacts of the proposed cement plant/power plant on the air quality in the vicinity of the proposed project, and we requested that these impacts be determined from accurate meteorological data. The information requested in that letter (except for the additional socioeconomic impact information) is also required by the Bureau before we can continue processing the state permit applications for the cement plant and federal PSD permit application for the proposed cement plant/power plant project. Please send us a copy of the information you provide the Power Plant Siting Section as a response to the March 10 letter. You do not have to send us a duplicate of the modeling output.

When all the required information is received, we will resume processing your applications. If you have any questions on the data requested, please contact Bill Thomas, Bob King or Cleve Holladay at (904)488-1344.

Sincerely,

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

CHF/CH/bjm

cc: John Koogler
Dan Williams

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

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

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

March 10, 1983

Richard Entorf
Senior Vice-President
Florida Crushed Stone Company
P. O. Box 317
Leesburg, Florida 32748

Subject: Proposed 125 MW Electric Co-generating Plant - Brooksville, Florida

Dear Mr. Entorf:

We have found inaccuracies in the meteorological data used to analyze the impacts of the proposed power plant on the air quality in the vicinity of the proposed power plant site and in the Chassahowitzka Class I PSD area. These inaccuracies would change the values of the predicted air quality impacts due to particulate matter and sulfur dioxide emissions from the proposed power plant. These values are summarized in Table 6-2 of the air quality review which was submitted as part of the original power plant siting application. In addition, these inaccuracies would change the values of the predicted air quality impacts on the Chassahowitzka Class I area contained in the December 27, 1982 letter from Holland and Knight to the Department.

Since the predicted 24-hour average and annual average particulate matter impacts shown in Table 6-2 are extremely close to their respective ambient standards, we require these impacts to be determined from accurate meteorological data. Table 6-2 in the air quality review should be updated to reflect these changes. In addition, the predicted sulfur dioxide impacts on the Class I PSD area as shown in the table in the December 27, 1982 letter are very close to the maximum allowable 24-hour average Class I PSD increment. Again, we require these impacts to be determined from accurate meteorological data, with the results summarized in a table.

Moreover, the air quality impact values presently shown in Table 6-2 and in the December 27, 1982, letter do not reflect the reduced impacts due to the reduction of calculated emissions from the power plant stack and the proposed reduction in particulate matter emissions from the cement plant portion of your proposed

project. Consequently, the required reanalysis may result in air quality impact values that are somewhat less than the previous values.

Within the past two weeks, the Department has communicated the details of these inaccuracies to your consultant, Dr. John Koogler of Sholtes and Koogler, Environment Consultants. He has already provided the Department with some of the corrected information we require to continue processing this application, and he is in the process of providing the remainder of this required information.

Even though the corrected information may show smaller air quality impact values, these values are still likely to be close to air quality standards and PSD increments. Because of this, we are concerned about the impact this project will have on future, proposed industrial projects in the Hernando County area. Therefore, we are also requesting that you provide additional socioeconomic information that will address this concern.

If you have any questions concerning these matters, please call Cleve Holladay at 904-488-1344.

Sincerely,

Hamilton S. Oven, Jr.

Hamilton S. Oven, Jr., P.E.
Administrator
Power Plant Siting Section

HSO/CH/bjm

cc: C. H. Fancy
J. Koogler

SHOLTES & KOOGLER, ENVIRONMENTAL CONSULTANTS
1213 N.W. 6th Street Gainesville, Florida 32601 (904) 377-5822

SKEC 307-82-02

February 24, 1983

Mr. Larry Curtin
Holland & Knight
92 Lake Wire Drive
Lakeland, FL 33802

DER
FEB 25 1983
BAQM

Subject: Florida Crushed Stone Company
Proposed Cement Plant/Power Plant
Hernando County, Florida

Dear Larry:

During the past week, I have had discussions with two FDER staff members regarding the applications for state and federal PSD review and for the air pollution source construction permits that have been submitted to FDER for the cement plant and power plant proposed by Florida Crushed Stone. I am hereby transmitting the information discussed during these conversations so that you can forward it to FDER. Hopefully this information will satisfactorily respond to the final questions that FDER has on these applications.

Cement Plant On February 16, 1983, I hand delivered to the FDER staff information related to controlled and uncontrolled pollutant emission rates from the cement plant and power plant and to the associated air pollution control equipment efficiencies for controlling these emissions. Included in this information were three figures showing gas flows through the cement plant and power plant under three sets of operating conditions; with both the cement plant and power plant operating, with the power plant only operating and with the cement plant only operating. There were questions raised regarding the gas flow when both the power plant and cement plant were operating and when the cement plant only was operating. These questions related to the distribution of the air from the clinker cooler and to the reference to an air heater shown on the flow sheet which depicted air flows when only the cement plant was operating.

On the attached revised sheets showing air flow when the power plant and cement plant are operating and when the cement plant only is operating, I have shown the distribution of the heated air from the clinker cooler. When the power plant and cement plant both are operating, 36,350 standard cubic feet per minute, wet (0°C, at 29.92 inches, Hg) of clinker cooler gases at a temperature of 1,650°F are directed to the cement

kiln. The remaining 72,700 standard cubic feet per minute, wet, of clinker cooler gases are used as combustion air in the power plant. When only the cement plant is operating, the same volume of heated clinker cooler air is used as combustion air in the cement kiln. The remaining 72,700 standard cubic feet per minute, wet, of gases at 410°F are split with 58,624 standard cubic feet per minute passing through the raw mill and 14,078 standard cubic feet per minute by-passing the raw mill. These air flows are shown on the attached sheets.

The air heater which was referenced on the flow diagram depicting air flows when the cement plant only is operating, will not be installed by Florida Crushed Stone. This air heater was proposed at the time that Florida Crushed Stone was considering a 75 megawatt power plant. With the 125 megawatt power plant presently proposed by Florida Crushed Stone, the air heater will not be necessary and will not be installed. The attached revised flow diagram shows this air heater deleted.

There was also a question related to the status of two proposed sources; H-15, a fabric filter collector controlling emissions from the kiln feed calibration bin and source Q-18, the fabric filter collector controlling emissions from loading spouts on cement silos. Source H-15 will be constructed. Signed construction permit applications have been forwarded to FDER by Florida Crushed Stone Company. Source Q-18 will not be constructed at this time since the cement silos which would have been vented through this collector will not be constructed. Four cement storage silos will be constructed and the discharge from these silos will be controlled by collector Q-17.

A general information question was also raised regarding the operation of the bag collector controlling emissions from the cement plant and power plant. This question related to the internal workings of the bag collector when the cement plant only or the power plant only was operating. The total gas stream entering the baghouse under all conditions; with both the cement plant and power plant operating, with the power plant only operating and with the cement plant only operating, will pass through the entire baghouse. There are no internal dampers which partition off sections of the baghouse when the air flow rate is reduced as a result of either the cement plant or the power plant not operating. There are 28 compartments within the baghouse, each containing 114 bags. These individual compartments are partitioned off by internal dampers during the cleaning cycle for each compartment and can also be partitioned off to permit maintenance within individual compartments while the remaining sections of the baghouse operate normally. The partitioning off of one of the 28 baghouse compartments for maintenance will result in the air to cloth ratio being increased from 1.6 ACFM per square foot to 1.66 ACFM per square foot. Even at the increased air to cloth ratio of 1.66, the baghouse will meet design specifications.

Cement Plant/Power Plant - Questions were raised regarding the impact of emissions from the combined cement plant and power plant on the Chassahowitzka Class I PSD Area. The questions related to the use of a decay coefficient for sulfur dioxide, the mixing height meteorological data used in some of the sulfur dioxide impact analyses, and the meteorological data used in evaluating the particulate matter impacts.

A sulfur dioxide half-life of 12 hours had been used in evaluating the impact of sulfur dioxide emissions from the proposed facility on the Class I PSD area. EPA has adopted a rather arbitrary policy which disallows the use of a sulfur dioxide half-life if the distance from the source to the receptor is less than 50 kilometers. The distance from the proposed Florida Crushed Stone facility to the Chassahowitzka National Wildlife Refuge is approximately 20 kilometers hence, the use of the sulfur dioxide half-life is not permitted by EPA. This half-life has been removed and the Class I Area sulfur dioxide impact re-evaluated.

The meteorological data which were used to evaluate the sulfur dioxide impacts on the Class I PSD area represented data for calendar years 1973, 1974, 1975, 1978 and 1979 from Tampa, Florida. When the model runs were made using 1975 and 1978 data, mixing height data which were generated using Orlando surface observations and Tampa upper air observations were inadvertently used. The revised model runs have been made using mixing height data for all years that has been generated using Tampa surface and Tampa upper air observations (referred to as Tampa-Tampa mixing height data). The revised impact analyses use 1981 Tampa data in place of the 1978 data since 1978 Tampa-Tampa mixing height data are not presently available.

As a result of the revisions described herein, the sulfur dioxide impact analyses on the Class I PSD area were conducted with meteorological data from Tampa representing calendar years 1973, 1974, 1975, 1979 and 1981 and incorporating the assumption that the life of sulfur dioxide in the ambient air was infinite. The sources included in the analyses are the power plant and cement plant proposed by Florida Crushed Stone and other new sources of sulfur dioxide that can be expected to impact the Class I PSD area under the same meteorological conditions that cause the Florida Crushed Stone sources to impact the area.

To make the particulate matter impact analyses on the Class I PSD area consistent with the sulfur dioxide impact analyses, the particulate matter analyses were revised to incorporate meteorology for calendar years 1973, 1974, 1975, 1979 and 1981 from Tampa. The particulate matter impact analyses incorporate the assumption that there is no particle settling or deposition and included all new particulate matter sources expected to impact the Class I Area under the conditions that cause the Florida Crushed Stone sources to impact the Area.

The height of the cement plant/power plant baghouse stack proposed by Florida Crushed Stone was increased to 310 feet to assure there would be no significant impact on the Class I Area.

The ISC-ST model runs which comprise the sulfur dioxide and particulate matter impact analyses on the Class I PSD Area are attached hereto. The results of these impact analyses are summarized in the attached Table. These results show that neither the Florida Crushed Stone sources alone, nor the Florida Crushed Stone sources combined with other new sources in the area will result in a particulate matter or sulfur dioxide impact on the Chassahowitzka Class I PSD Area that will exceed applicable PSD increments.

The information contained herein should satisfactorily respond to the questions raised by the FDER staff within the past week. If there are further questions regarding this information or if additional information is required, please feel free to contact me.

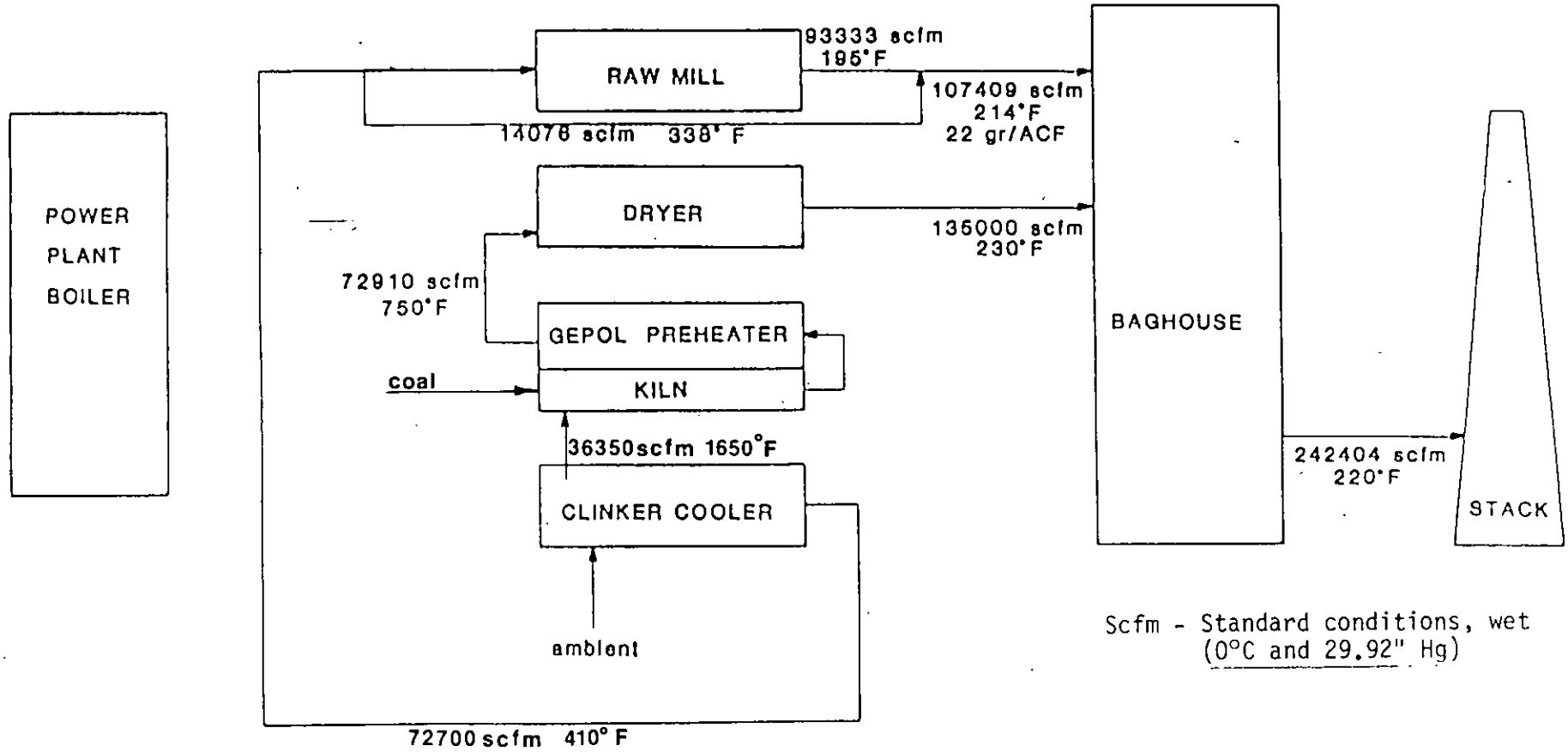
Very truly yours,

SHOLTES & KOOGLER
ENVIRONMENTAL CONSULTANTS, INC.

John B. Koogler, Ph.D., P.E.

JBK:sc
Enclosures

cc: Mr. Richard C. Entorf (w/att.)
Mr. Clair Fancy (w/att.)

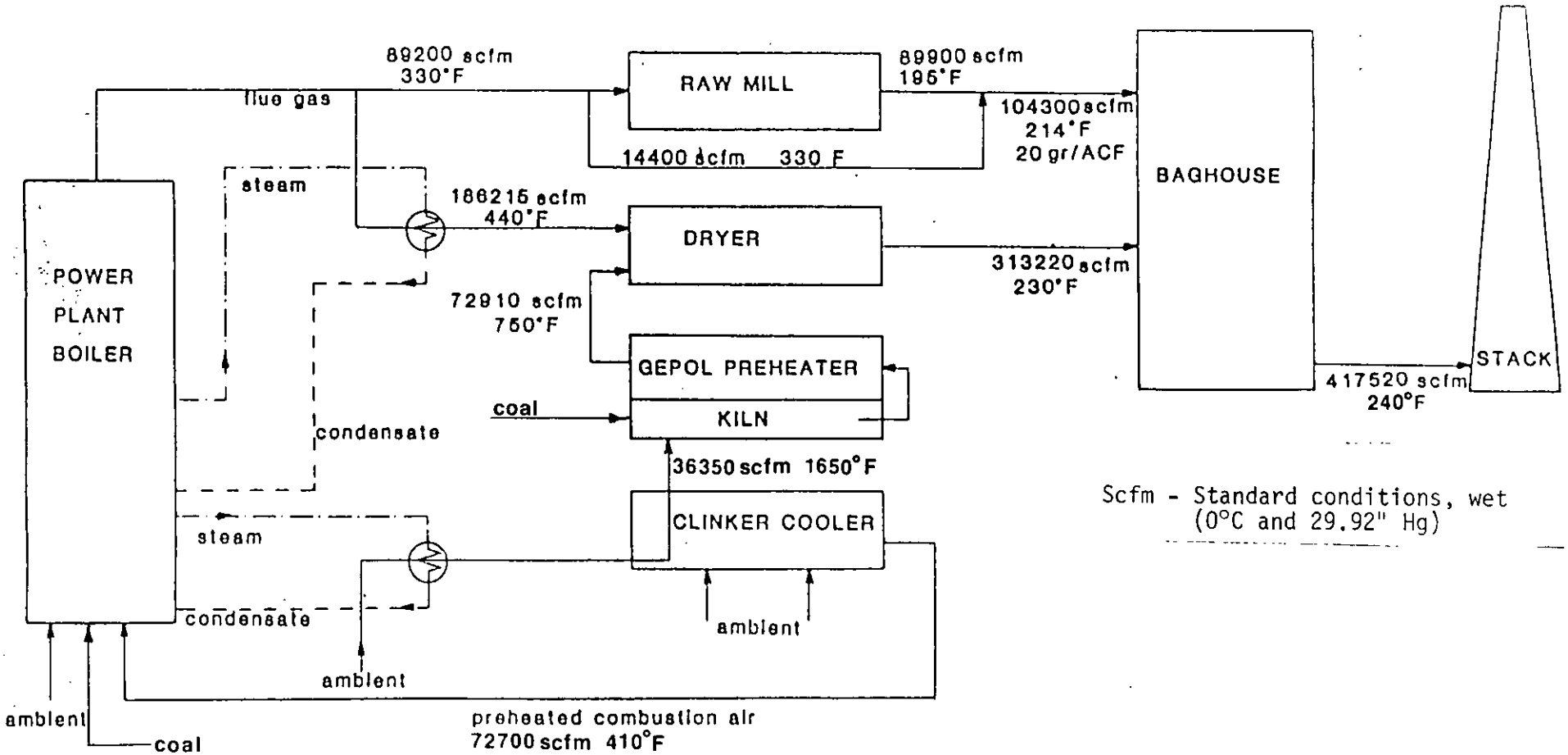


Scfm - Standard conditions, wet (0°C and 29.92" Hg)

POWER PLANT NOT OPERATING/CEMENT PLANT OPERATING

Florida Crushed Stone Company
P.O. Box 317
Leesburg, Fla. 32748

Revised 10/29/82



Scfm - Standard conditions, wet
(0°C and 29.92" Hg)

POWER PLANT OPERATING/CEMENT PLANT OPERATING

P.O. Box 317

Florida Crushed Stone Company

Leesburg, Fla. 32748

Revised 10/29/82

SUMMARY OF NEW SOURCE IMPACTS
ON CLASS I PSD AREAS

FLORIDA CRUSHED STONE COMPANY
HERNANDO COUNTY, FLORIDA

	Sulfur Dioxide Impact (ug/m^3)					
	Annual		24-Hour		3-Hour	
Year	FCS	All New	FCS	All New	FCS	All New
1973	0.6	0.6	4.1	4.4	17.5	19.1
1974	0.6	0.7	4.1	4.3	17.3	17.6
1975	0.6	0.7	4.7	4.7	18.1	20.1
1979	0.5	0.6	4.4	4.7	15.4	16.6
1981	0.5	0.5	3.5	3.6	16.4	16.4

	Particulate Matter Impact (ug/m^3)			
	Annual		24-Hour	
Year	FCS	All New	FCS	All New
1973	0.1	0.4	1.0	1.8
1974	0.1	0.3	0.9	1.5
1975	0.1	0.3	0.8	1.5
1979	0.1	0.3	0.8	1.3
1981	0.1	0.3	0.8	1.6

FCS

FLORIDA CRUSHED STONE COMPANY

February 17, 1983

Patty

DER

FEB 18 1983

BAQM

Mr. C. H. Fancy, P.E.
Deputy Chief
Department of Environmental Regulation
Twin Towers Office Building
2600 Blairstone Road
Tallahassee, FL 32301-8241

Re: Cement Plant
Brooksville, FL

Dear Mr. Fancy:

In reference to Dr. John Koogler's letter dated February 16, 1983 to you, it has been determined that source H-15 (Kiln Feed Baghouse) will be left in the system. Attached please find four copies of source application.

If you have any questions concerning this, please contact me.

Sincerely,

G. A. Skip Haskell
Manager Industrial Relations

GAH/se
enclosures

SHOLTES & KOOGLER, ENVIRONMENTAL CONSULTANTS
1213 N.W. 6th Street Gainesville, Florida 32601 (904) 377-5822

SKEC 307-82-02

February 16, 1983

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

Subject: Florida Crushed Stone Company
Brooksville, Hernando County, Florida
AC27-16016

Dear Mr. Fancy:

In response to your letter dated February 14, 1983, I have performed the necessary calculations to estimate the uncontrolled particulate matter entering the cement plant-power plant baghouse (Source E-20) and have calculated the expected efficiency of this baghouse for reducing particulate matter emissions under various operating conditions. All of the calculations and the assumptions and conditions upon which the calculations were based are included in the attached package. To expedite your review of this material I will summarize the attached material.

The cement plant-power plant can operate under three basic sets of conditions; (1) both the cement plant and power plant operating, (2) the cement plant only operating and (3) the power plant only operating. In addition to these three operating modes, the recovery of waste heat from gas streams, as proposed by Florida Crushed Stone, results in exhaust gas recirculation and reuse which is unique to this facility. Taking these factors into consideration I have applied the uncontrolled emission factors from the EPA publication AP-42 that you referenced to estimate the uncontrolled emission rate of all pollutants generated by the facility. These uncontrolled emissions were then combined with the proposed allowable emission rates to calculate the control efficiency of either the baghouse or the plant operating system for removing the various pollutants.

Prior to discussing the assumptions that were used to calculate the uncontrolled emissions, a comment on the applicability of the AP-42 emission factors is in order. For the coal fired power plant operating as an individual source, the emission factors presented in Section 1.1 of AP-42 are appropriate and will provide a "best estimate" of uncontrolled emissions. Likewise, the uncontrolled emission estimates in Section 8.6 of AP-42 for "dryers, grinders, etc." represent reasonably well the expected uncontrolled emissions from the raw mill and the raw materials dryer associated with the cement plant. The uncontrolled particulate matter emission factor associated with these sources is reported to be 96 pounds of particulate matter per ton of material processed. This same emission factor will also represent, reasonably well, the uncontrolled emissions from the clinker cooler. The uncontrolled emission factor for particulate matter emissions from a dry process cement kiln, as reported in AP-42, is 245 pounds per ton of kiln feed.

These emission factors are based upon the cement plant depicted in Figure 8.6-1 of AP-42. The cement plant proposed by Florida Crushed Stone is different in many respects from the cement plant depicted in AP-42. First, in the Florida Crushed Stone plant all of the air which passes through the clinker cooler is used as combustion air for the cement kiln, combustion air for the power plant boiler or as drying air in the raw mill. Secondly, in the Florida Crushed Stone cement plant all of the gases exhausted from the cement kiln are used to provide heat to the raw materials dryer. These gases, after passing through the raw materials dryer, then enter the baghouse. Thirdly, the gases exhausted from the power plant proposed by Florida Crushed Stone are exhausted directly to the baghouse if only the power plant is operating or they are split between the raw mill and raw materials dryer if the cement plant is operating. In the latter case, a small fraction of the power plant exhaust gases by-pass the raw mill and are used to reheat the gas stream exhausted from the raw mill prior to this gas stream being introduced to the baghouse.

It should be quite apparent, based on the factors just discussed, that the AP-42 emission factors are not directly applicable to the Florida Crushed Stone plant. In spite of the differences, the emission factors were applied in order to obtain some reasonable estimate of uncontrolled emissions. In applying the emission factors two basic assumptions were made. In several cases a single gas stream passes through more than one processing unit; for example, the clinker cooler gases pass through the kiln and then through the raw materials dryer. When such a condition exists, it was assumed that the uncontrolled emissions transported by the gas stream as it entered the baghouse would be the highest uncontrolled emission rate from any single processing unit the gas stream passed through. This assumption has been made rather than to assume the gas stream would accumulate uncontrolled emissions from each processing unit. As a basic example of this assumption, assume that all of the gases exhausted from the clinker cooler

pass through the kiln and that all the gases from the kiln pass through the dryer before they enter the baghouse. By applying the emission factors from AP-42, the uncontrolled emissions from the clinker cooler are calculated to be 7,200 pounds per hour; from the kiln they are calculated to be 30,331 pounds per hour; and from the dryer they are calculated to be 10,810 pounds per hour. For this particular example, the maximum uncontrolled emissions entering the baghouse in the gas stream which passed through all three processing units would be 30,331 pounds per hour. This assumption appears to be much more reasonable than the assumption that the uncontrolled emissions will be cumulative since there will be some deposition of particles within individual processing units.

The other assumption that was made in applying the AP-42 emission factors was that uncontrolled emissions would be prorated based on gas flow rates if an air stream was split. For example, when the power plant exhaust gases are split between the raw mill (32 percent) and the raw materials dryer (68 percent) it was assumed that 32 percent of the uncontrolled power plant emissions were introduced to the raw mill and 68 percent of the uncontrolled emissions were introduced to the raw materials dryer.

To be consistent throughout the applications for the construction permits for the cement plant kiln and the power plant, uncontrolled emission rates of sulfur dioxide, nitrogen dioxides, carbon monoxide and hydrocarbons were also calculated as were control efficiencies for these pollutants. Also, the construction permit applications for all of the other particulate matter emitting sources in the cement plant were revised to reflect the actual expected control efficiency for particulate matter. These latter calculations were based on particulate matter concentrations at the inlet and outlet of the control systems as estimated by Polysius Corporation, the design engineer for the cement plant.

I cannot help but comment regarding the requirement for the information provided herein. Florida Crushed Stone recognizes and accepts the fact that the emission rates of all pollutants from all sources at the proposed facility will be limited by emission limiting standards. These emission limiting standards will be the result of BACT determinations made by the Department. These emission limiting standards will also be the enforceable permit conditions regardless of whether a particular control efficiency is 100 percent or zero percent or any efficiency in between. The fact that the control efficiency stated in the original permit applications, when applied to uncontrolled emissions determined using very crude assumptions, do not yield a number which is equal to the allowable emission rate proposed by Florida Crushed Stone as BACT is, in my opinion, irrelavent. To require an applicant to go through an exercise of estimating uncontrolled emissions and then calculating an efficiency for a fabric filter collector also appears to be very academic.

It should be recognized by the Department that the fabric filter collectors proposed by Florida Crushed Stone are undoubtedly the most efficient control systems that are available for controlling particulate matter emissions. It should also be realized by the Department that these control systems have been proven effective in controlling emissions from other cement plants in the State of Florida and throughout the United States. And, it should further be realized that Florida Crushed Stone will comply with the emission limiting standard imposed for each source regardless of what the collector efficiency is and regardless of what the uncontrolled emissions going to the collector are. If there are any additional questions regarding the emission calculations or the efficiency calculations included herein, please give me a call.

Regarding the explanation of the applications which have been eliminated, the following reasons apply. The packing plant source (R-14) has been eliminated since all finished product will be shipped from the plant in bulk form and the packing plant will not be constructed. The masonry silos (R-16) have been eliminated because Florida Crushed Stone does not propose to produce masonry cement at the plant. The kiln feed source (H-15) is being evaluated by Florida Crushed Stone. The air stream from the calibration bin (H-05) which was vented through this source may be vented through collector F-14 or collector F-15 may be reinstalled. We will clarify this matter within the next few days.

If there are any questions regarding these sources, or other matters relating to Florida Crushed Stone Company permits, please give me a call.

Very truly yours,

SHOLTES & KOOGLER
ENVIRONMENTAL CONSULTANTS, INC.

John B. Koogler, Ph.D., P.E.

JBK:sc
Enclosures

cc: Mr. Richard C. Entorf
Mr. Larry Curtin