~~12.17.2~~
12.17.24

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

INTEROFFICE MEMORANDUM

For Routing To District Offices And/Or To Other Than The Addressee	
To:	Loctn.:
To:	Loctn.:
To:	Loctn.:
From:	Date:

TO: Jacob D. Varn
Secretary

FROM: J. P. Subramani, Chief
Bureau of Air Quality Management

DATE: August 16, 1979

SUBJECT: BACT Determination - Florida Power Corporation
Unit #2 Fly Ash Handling and Storage System,
Crystal River Plant, Citrus County

Facility: The existing Unit #2 electrostatic precipitator will be modified to include thirteen new fields. Along with this modification, the existing Unit #2 fly ash handling system will be changed to allow for storage of the ash in dry state. Currently ash from Unit #2 precipitator is hydraulically sluiced to an ash holding pond. In the modified system, the vacuum required to draw ash from the precipitator will be produced by vacuum blowers rather than by the existing hydroveyors. The two lines conveying the ash from the Unit #2 precipitator to the transfer silo will be vented to the atmosphere after each going through bag filters (sources #4 and #5).

BACT Determination Requested by the Applicant:

	Lbs/Hr.	Tons/Year
Source #4	2.2	9.6
Source #5	2.2	9.6

Date of Receipt of a Complete BACT Application:

June 25, 1979

Date of Publication in the Florida Administrative Weekly:

August 3, 1979

75

Date of Publication in a Newspaper of General Circulation:

August 5, 1979, St. Petersburg Times

Study Group Members:

A BACT determination on Unit #1 conveying line was completed January 30, 1979. There have been no significant technological improvements since that date. Thus we apply the same BACT, which obviates the need for a study group.

BACT Determination by the Department of Environmental Regulation:

Particulate	Lbs/Hr.	
Source #4	2.2	Attainable with a 99.9+% efficient bag dust collector
Source #5	2.2	Attainable with a 99.9% efficient bag dust collector
Test Method:		Methods 1 through 5, Title 40, Part 60 of the Code of Federal Regulations.

Justification of DER Determination:

A BACT determination on a Florida Power Unit #1, Fly Ash Handling system was completed in January 1979. There has been no significant improvement in technology since that date, and the low emission limitation determined as BACT for the fly ash conveying lines for Unit #2 represent 99.9% efficiency.

Details of the Analysis May be Obtained by Contacting:

Victoria Martinez, BACT Coordinator
Department of Environmental Regulation
Bureau of Air Quality Management
2600 Blair Stone Road
Twin Towers Office Building
Tallahassee, Florida 32301

Recommendation from: Bureau of Air Quality Management

by: J. P. Subramani

Date: August 20, 1979

Approved by: Jacob D. Varn

Date: 21st August 1979

JDV/es

Attachment

State of Florida

DEPARTMENT OF ENVIRONMENTAL REGULATION

INTEROFFICE MEMORANDUM

For Routing To District Offices And/Or To Other Than The Addressee	
To:	Loctn.:
To:	Loctn.:
To:	Loctn.:
From:	Date:

TO: District Managers

ATTN: Air Engineers and Local Programs

FROM: Victoria Martinez VM

DATE: August 27, 1979

SUBJECT: Best Available Control Technology (BACT) Pursuant to Chapter 17-2.03 FAC

Attached for your information is a copy of the BACT determination by the Department of Environmental Regulation for a Fly Ash Handling and Storage System, Unit #2, Crystal River Plant, Citrus County. The control technology established by the BACT determination is as follows:

Particulate	Lbs./Hr.	
Source #4	2.2	Attainable with a 99.9+% efficient bag dust collector
Source #5	2.2	Attainable with a 99.9% efficient bag dust collector
Test Method		Methods 1 thru 5, Title 40, Part 60 of the Code of Federal Regulations.

Information regarding the determination may be obtained by writing Victoria Martinez, Department of Environmental Regulation, 2600 Blair Stone Road, Twin Towers Office Building, Tallahassee, Florida 32301

VM/es

Attachment

cc: Jim Estler

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

APPLICATION FOR DETERMINATION OF BEST AVAILABLE CONTROL TECHNOLOGY FOR AIR POLLUTION SOURCES

SOURCE STATUS: ( ) New (X) Modification

Company Name: FLORIDA POWER CORPORATION County: Citrus

Source Identification: Crystal River Units 1 & 2 Fly Ash Handling System

Source Location: Street: Crystal River Plant Site City:

UTM: East See Below North See Below

Appl. Name and Title: N. B. Spake, Vice President

Appl. Address: P. O. Box 14042, St. Petersburg, FL 33733

Appl. Phone: 813/866-4763

DEPARTMENT USE ONLY

Date Appl. Received: June 25, 1979

Notice of Receipt:

Newspaper: St. Petersburg Times Date: August 5, 1979

Florida Administrative Weekly Date: August 3, 1979

BACT Determination:

Declared by Secretary: Jacob D. Varn Date: August 21, 1979

BACT:

NOTICE OF DETERMINATION

Newspaper: Date:

Florida Administrative Weekly Date:

UTM: East S4 334212.51 North S4 3204252.405
S5 334215.26 S5 3204249.053

I. DETAILED DESCRIPTION OF SOURCE

A. Describe the manufacturing process at the facility and the unit operation to be controlled. Discuss the source of emissions, existing control devices, the expected improvement in performance, and state whether the project will result in compliance with ambient air quality standards or applicable PSD increments. Attach additional sheet if necessary.

See attached Exhibit A and Dwg. No. CR-L2-A-4

B. For this source indicate any previous DER permits, orders, and notices; including issuance dates and expiration dates.

C. Raw materials, fuels, and chemicals used:

DESCRIPTION	HOURLY USE	CONTAMINANTS		RELATION
		TYPE	% WT.	TO FLOW DIAGRAM

D. Process Rate

Source 4 .... 27.5 TPH Fly Ash
Source 5 .... 27.5 TPH Fly Ash

1. Total Process Input Rate:

Source 4 .... 27.5 TPH Fly Ash
Source 5 .... 27.5 TPH Fly Ash

2. Product Output Rate:

3. Operating Time: Continuous

a. Hrs./Day: b. Days/Wk: c. Wks./Yr.: d. Seasons:

II. BEST AVAILABLE CONTROL TECHNOLOGY DATA

A. Emission limitations for any pollutants emitted from the source pursuant to 17-2 F.A.C.?

Yes ( ) No ( )

CONTAMINANT	FOR CLASS II AREA MAXIMUM ALLOWABLE INCREASE IN CONCENTRATIONS RATE OR CONCENTRATION
-Particulate	Annual geometric mean: 19 ug/m^3 24 hr max 37 ug/m^3
SO_X as SO_2	Annual arithmetic mean: 20 ug/m^3 24 hr max: 91 ug/m^3 3 hr max. 512 ug/m^3
NO_X as NO_2	----------
HC as (H_4)	----------
CO	----------

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

Yes ( ) No (X)

CONTAMINANT	RATE OR CONCENTRATION
Particulate	*Not Applicable
SO_X as SO_2	* 150 ppm by volume
NO_X as NO_2	* 75 ppm by volume base limitation
HC as (H_4)	*Not Applicable
CO	*Not Applicable

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

Yes (X) No ( ) Note: BACT has been determined for sources 1, 2, & 3 - copy of BACT determination attached.

CONTAMINANT	RATE OR CONCENTRATION

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

CONTAMINANT	Lbs/Hr	RATE OR CONCENTRATION Tons/Yr**
Fly Ash Particulate, Source 4	2.2	9.6
Fly Ash Particulate, Source 5	2.2	9.6

** Based on 100% continuous load.

E. Describe the existing control and treatment technology (If any)

1. Control Device:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:
5. Useful Life:
6. Operating Costs:
7. Energy:
8. Maintenance Cost:
9. Emissions

*Reference is made to page 53783, Selection of Pollutants, Federal Register, Vol. 42 No. 191, Monday, October 3, 1977.

*Explain method of determining E., 3. above.

CONTAMINANT	RATE OR CONCENTRATION	
	Before Device	After Device

10. Stack Parameters

a. Height: Ft.

b. Diameter: Ft.

c. Flow Rate: ACFM

d. Temperature: °F

e. Velocity: FPS

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

1. Data applied to dust collectors except as noted.

a. Control Device: Bag Dust Collectors

b. Operating Principles: Polyester felt bag material filters fly ash from the dust laden air entering allowing clean air to escape. Dust collecting on bag surface is agitated by compressed air or vibration and falls below.

c. Efficiency: 99.9+%

d. Capital Cost: Source 4 Dust Collector $21,000
Source 5 Dust Collector 21,000

e. Life: 20 years

f. Operating Cost: Not currently available

g. *Energy: Nil

h. Maintenance Cost: Not currently available

i. Availability of construction materials and process chemicals:
Readily available

j. Applicability to manufacturing processes:
Dust collectors are adequately applicable to the system

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

2.

a. Control Device:

b. Operating Principles:

c. Efficiency:

d. Capital Cost:

e. Life:

f. Operating Cost:

g. Energy:

h. Maintenance Costs:

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:

*Energy to be reported in units of electrical power - KWH design rate.

3.

a. Control Device:

b. Operating Principles:

c. Efficiency:

d. Capital Cost:

e. Life:

f. Operating Cost:

g. Energy:

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:

d. Capital Cost:

e. Life:

f. Operating Cost:

g. Energy:

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:

G. Describe the control technology selected:

1. Control Device: Bag Dust Collectors
2. Efficiency: 99.9+%
3. Capital Cost: Source 4 Dust Collector $21,000
   Source 5 Dust Collector 21,000
4. Life: 20 years
5. Operating Cost: Not available
6. Energy: Nil
7. Maintenance Cost: Not available
8. Manufacturer: Source 4 - Mikropulsaire Model #55-8-FV
   Source 5 - Mikropulsaire Model #55-8-FV
9. Other locations where employed on similar processes:

   a. Not presently employed at any FPC facility

   (1) Company:

   (2) Mailing Address:

   (3) City:

   (4) State:

   (5) Environmental Manager:

   (6) Telephone No.:

   (7) Emissions:

CONTAMINANT	RATE OR CONCENTRATION

(8) Process Rate:

b.

(1) Company:

(2) Mailing Address:

(3) City:

(4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:

CONTAMINANT	RATE OR CONCENTRATION

(8) Process Rate:

c.

(1) Company:

(2) Mailing Address:

(3) City:

(4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:

CONTAMINANT	RATE OR CONCENTRATION

(8) Process Rate:

d.

(1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:

CONTAMINANT	RATE OR CONCENTRATION

(8) Process Rate:

e.

(1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:

CONTAMINANT	RATE OR CONCENTRATION

(8) Process Rate:

10. Reason for selection and description of systems: Bag dust collectors are the only existing feasible control technology for this service.

11. Emissions:

CONTAMINANT	Lbs/Hr	RATE OR CONCENTRATION	Tons/Yr.*
Fly Ash Particulate, Source 4	2.2		9.6
Fly Ash Particulate, Source 5	2.2	-	9.6
		-	
		* Based on 100% continuous load	

12. Stack Parameters: See Attached Exhibit A

a. Height: Ft.

b. Diameter: Ft.

c. Flow Rate: CFM

d. Temperature: °F

e. Velocity: FPS

13. Fuels:

TYPE	HOURLY USE*		HOURLY HEAT INPUT MILLION BTU/HR.	
	AVG.	MAX.	AVG.	MAX.

TYPE	DENSITY	%S	%N	%ASH

*Gaseous: Cu. Ft./Hr.; Liquid & Solid: Lbs./Hr.

14. Wastes generated, disposal method, cost of disposal: The Fly Ash collected in the storage silo is disposed of by truck either by FPC or a future contractor. Disposal by FPC would cost an estimated $363,000 per year. Cost of disposal by contractor is currently unknown.

H. Discuss the social 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.

See attached Exhibit C - Social Economic Impact
See attached Exhibit D - Environmental Impact

III. ADDITIONAL ATTACHED INFORMATION

A. Show derivation of total process input rate and product weight. See attached Exhibit B

B. Show derivation of efficiency estimation. Dust collector efficiencies are as reported or guaranteed by manufacturer.

C. An 8½" 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 exist, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained. See Dwg. No. CR 1 & 2-L4-A-0

D. An 8½" x 11" plot plan showing the exact location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram. See Dwg. No. CR-CC-G9-A-2

E. An 8½" x 11" plot plan showing the exact location of the establishment, and points of airborne emissions in relation to the surrounding area, residences and other permanent structures and roadways. See Dwg. No. CR-L3-A-0

F. Attach all 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.

PROFESSIONAL ENGINEER REGISTERED IN FLORIDA

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 judgement, that 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 the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signature: J. S. Pachul

Name: J. S. Pachul
(Please Type)

Mailing Address: P. O. Box 14042
St. Petersburg, Florida 33733

Company Name: Florida Power Corporation

Telephone No.: 813-866-5151

Florida Registration Number: 19325
(Affix Seal)

Date: June 8, 1979

EXHIBIT A

CRYSTAL RIVER UNIT 2
FLY ASH HANDLING SYSTEM
PRECIPITATOR MODIFICATION

Subsequent to the Unit 2 coal conversion, the air quality control requirements for the Crystal River site resulted in the need for designing to a lower than originally anticipated sulphur content in the future coal supply for Crystal River Unit 2. This requirement combined with inadequacy of the initial precipitator modification to achieve compliance with federal emission regulations resulted in the need to upgrade the Unit 2 precipitator capability. Consequently, the existing electrostatic precipitator will be modified by adding 13 new fields, and a new precipitator will be added. The total Unit 2 gas flow will be divided between the modified and the new precipitator.

Currently, the fly ash is evacuated from the existing Unit 2 precipitator and economizer hoppers by means of a dry vacuum produced by the dual jet hydroevactors using high pressure sea water. Along with the precipitator modification and addition, the existing Unit 2 dry fly ash system will be changed such that the vacuum required to draw ash from the precipitator (2A, 2B & 2C) will be produced by vacuum blowers (as currently on Unit 1) and not by the hydroveyors. The hydroveyors will be left to serve as a back-up. The two new bag filters are identical, and are similar to that on Unit 1. Listed below is the technical information and specifications applicable to each of the two new bag filters:

Source 4 & 5

Efficiency - 99.9+%

Cost - $21,000

Supplier - United Conveyor Corporation

Manufacturer - Mikro-Pul Corporation

Name - Mikro-Pulsaire

Model - #55-8-FV

Blower exhaust diameter - 10 inches

Blower exhaust height - 8 feet

Air to cloth ration - 3.64 ACFM/ft.^{2}

Air flow rate - 1887 ACFM

Area of filtering media - 518 ft.^{2}

Velocity - 3186 ft/min.

Process weight - 27.5 tons ash per hour

Actual discharge - 2.2 lbs. per hour or 9.6 tons per year

EXHIBIT B

CALCULATION SHEET

ASH HANDLING SYSTEM AIRBORNE CONTAMINANTS

CRYSTAL RIVER UNIT 2 PRECIPITATOR MODIFICATION

Source 4: Precipitator 2C Conveying Line Bag Filter

27.5 tons per hour (max design) of ash is drawn from Unit 2 precipitator through the separator where 96% of the ash is removed and flows into the transfer silo. The remaining ash and air enter the bag filter where 99.9% of the ash is removed with the air exhausted through the vacuum blower. Actual discharge estimate based on 96% efficient separators and 99.9% efficient bag filter.

Process Weight

Design fly ash rate from Unit 2 precipitator	27.5 tons per hour

Actual Discharge

27.5 TPH x 0.04 x 0.001	2.2 lbs. per hour 9.6 tons per year

Source 5: Precipitator 2A & 2B Conveying Line Bag Filter

27.5 tons per hour (max design) of ash is drawn from Unit 2 precipitator 2A & 2B through the separator where 96% of the ash is removed and flows into the transfer silo. The remaining ash and air enter the bag filter where 99.9% of the ash is removed with the air exhausted through the vacuum blower. Actual discharge estimate based on 96% efficient separators and 99.9% efficient bag filter.

Process Weight

Design fly ash rate from Unit 2 precipitator	27.5 tons per hour

Actual Discharge

27.5 TPH x 0.04 x 0.001	2.2 lbs. per hour 9.6 tons per year

EXHIBIT C

CRYSTAL RIVER UNIT 2 FLY ASH SYSTEM

SOCIAL ECONOMIC IMPACT

The installation of a dry fly ash collection facility for Crystal River Unit 2 provides flexibility and potential economy in the disposal of this waste material from the operation of the Crystal River Plants.

Dry fly ash has commercial value as an aggregate in the concrete industry. The market value of this material varies as a function of its demand, but can range from $5.00 to $6.00 per ton (Unit 2 produces an average of 320 tons per day of dry fly ash).

The construction of the dry fly ash collection system will employ a construction work force and supervisory staff of approximately 20 people. Capitalized construction cost is estimated at $815,000 including sales taxes of approximately $21,000. Construction payroll will impact the local community with expected average monthly payroll for the project of $50,000 over a 5 month period. This represents a benefit to employment and the local economy relative to the subsistence needs of these local and transient workers. In addition to labor payroll, construction materials and supplies will be purchased from local businesses. Additional sales taxes will be derived from partial expenditure of this payroll.

The system could become operational in August, 1979. The system will not create any new jobs as it will be operated and maintained by the same staff that will operate the existing system.

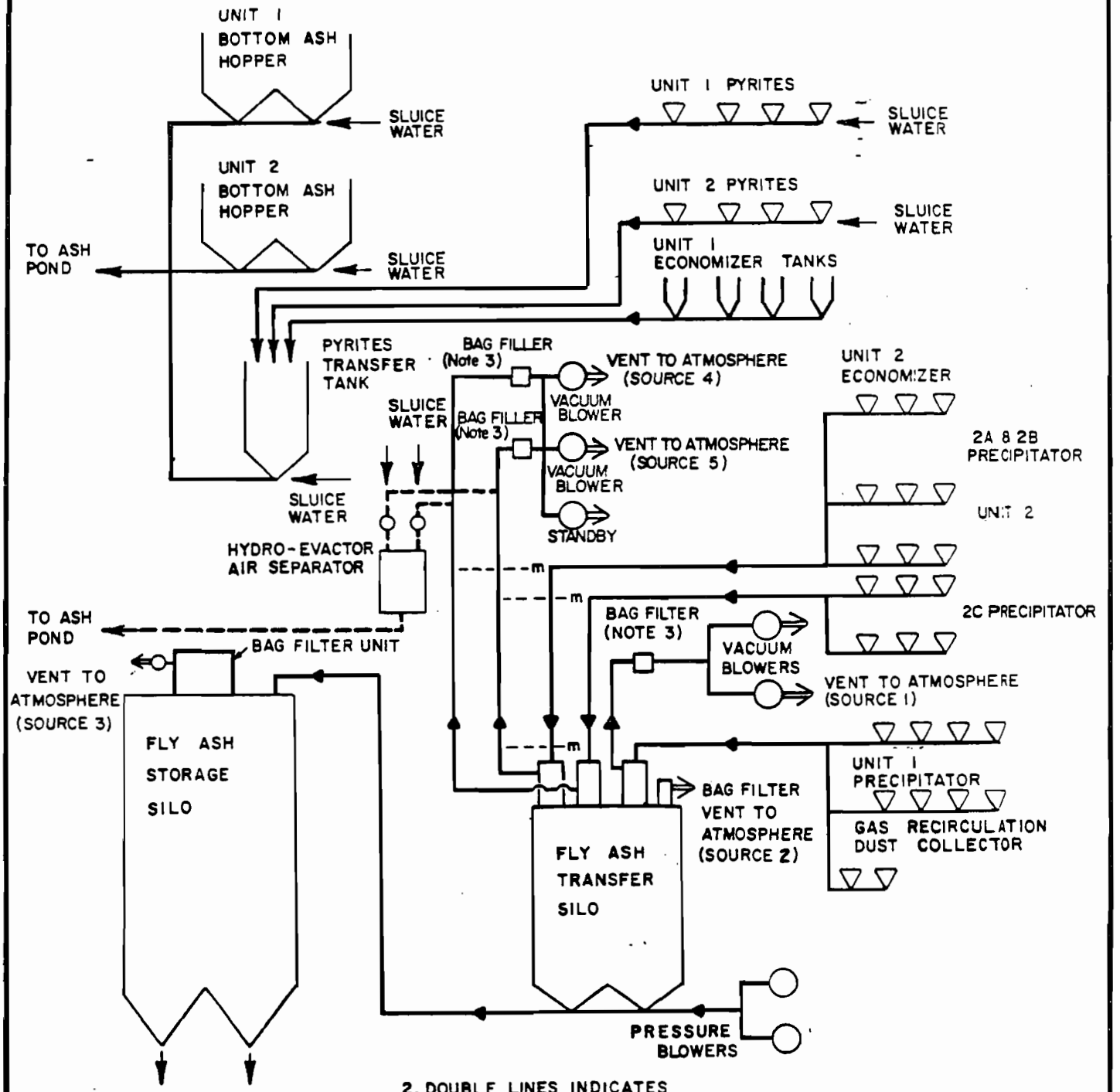
ASSESSMENT OF THE ENVIRONMENTAL IMPACT OF THE SOURCES

The Ash Handling System for Crystal River Units 1 & 2 includes a transfer silo to store coal fly ash. Ash from the transfer silo is pneumatically conveyed to a storage silo to be disposed of by truck. These facilities are to be located west of existing units 1 and 2 on previsously impacted land or compacted fill-dirt. No impact to natural vegetation or wildlife is anticipated. Should failure of the ash handling system occur, ash will be conveyed by means of seawater into the existing ash pond (refer to FDER Permit No. IC-09-5875).

The noise generated by construction of this facility will probably not be greater than noise emitted by existing operating facilities.

The only significant impact of this system is in terms of changes in air quality. Reference is made to FPC Dwg. No. CR-L2-A-4 for source locations and Florida Power Corporation's modified application for the Crystal River Ash Handling System (submitted April 6, 1978) for definition of hourly contributions of ash to the air.

FLORIDA POWER CORPORATION
SYSTEM ENGINEERING DEPARTMENT



NOTE:

1. DOTTED LINE INDICATES EMERGENCY FLY ASH DISPOSAL.
2. DOUBLE LINES INDICATES VENTED CONVEYING AIR
3. BAG FILTER DISCHARGES ASH TO TRANSFER SILO DISCHARGE

REVISIONS		
NO.	DATE	
1	2-28-78	ADDED VENTS
2	5-9-78	RELOCATE VENTS
3	6-20-78	ADDED DETAILS
4	2-20-78	2C PRECIPITATOR SYST'M.

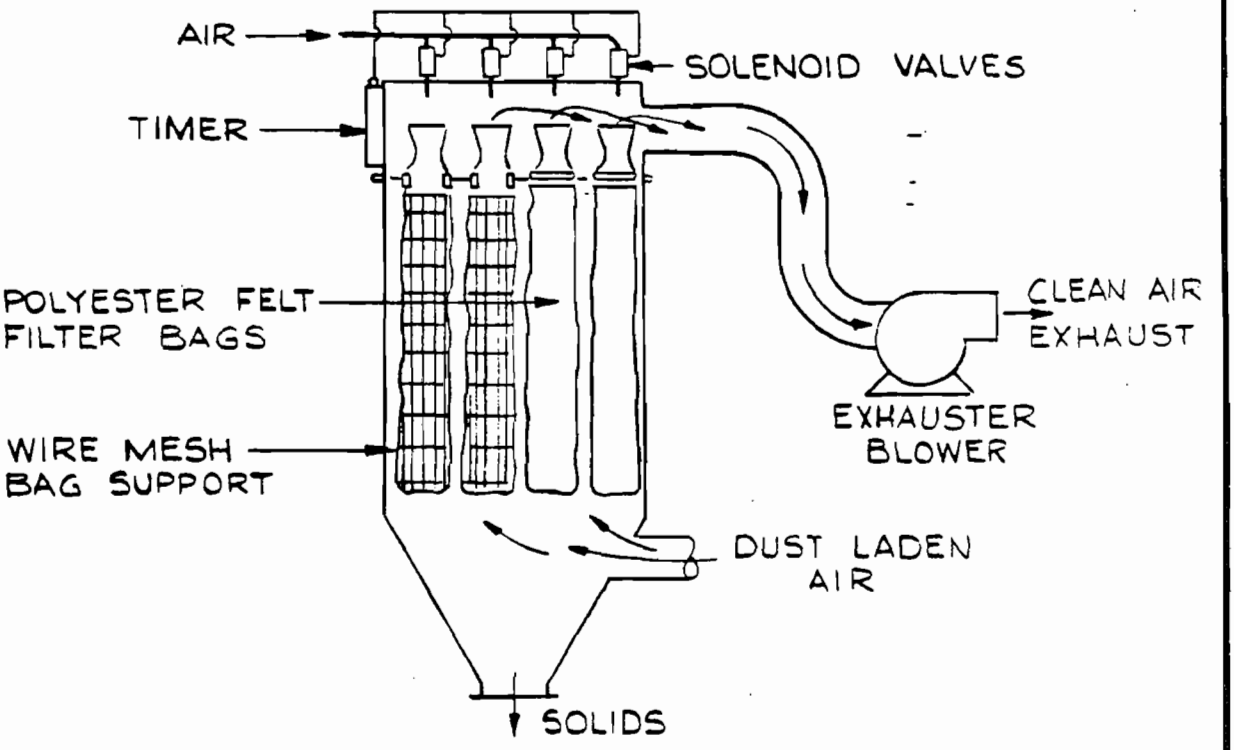
CRYSTAL RIVER UNITS 1 & 2

ASH HANDLING SYSTEM
COAL CONVERSION

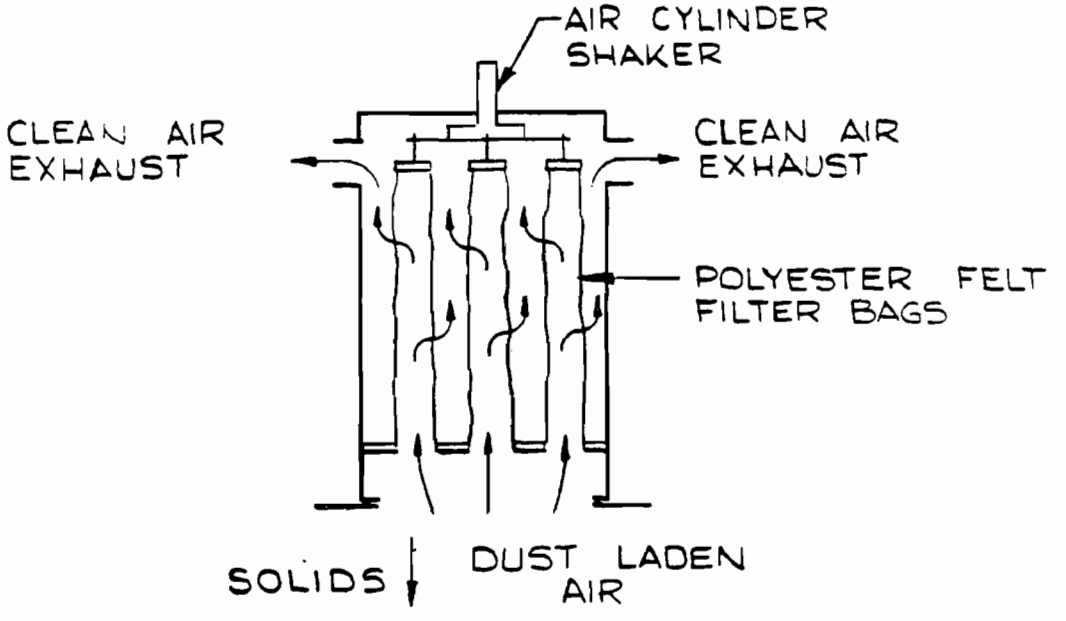
DRAWN BY	Vbeau.
DATE	10-6-77
CHECKED	
APPROVED	
SCALE	Not Shown

DWG. NO. CR-L2-A-4

FLORIDA POWER CORPORATION
SYSTEM ENGINEERING DEPARTMENT



SOURCE 1 & 3,4 & 5



SOURCE 2

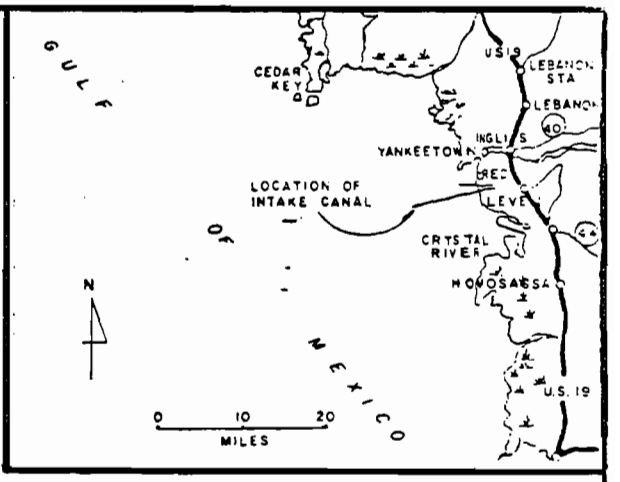
REVISIONS		
NO.	DATE	

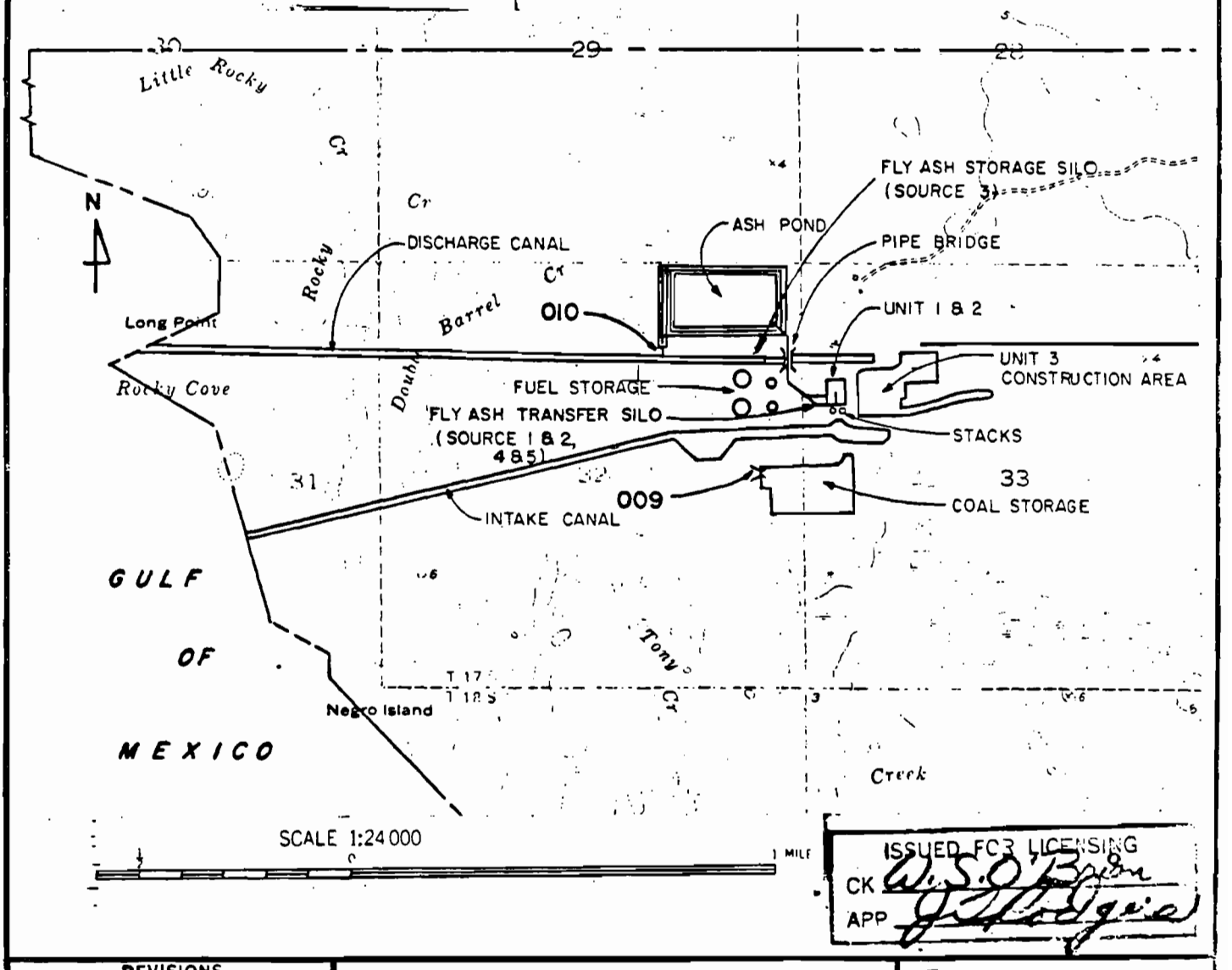
CR-CC Fly Ash Handling System Bag Filter Unit Schematic

DRAWN BY	R. Betts
DATE	6/22/78
CHECKED	
APPROVED	
SCALE	NONE

DWG. NO. CR1E2-L4-A-0

FLORIDA POWER CORPORATION
SYSTEM ENGINEERING DEPARTMENT





ISSUED FOR LICENSING
CK W.S.O'Brien
APP J.T.Hodges

REVISIONS		
NO.	DATE	
1	2/28/78	ADDED FLY ASH SILO EXT
2	3/9/79	ADDED SOURCE 4 & 5

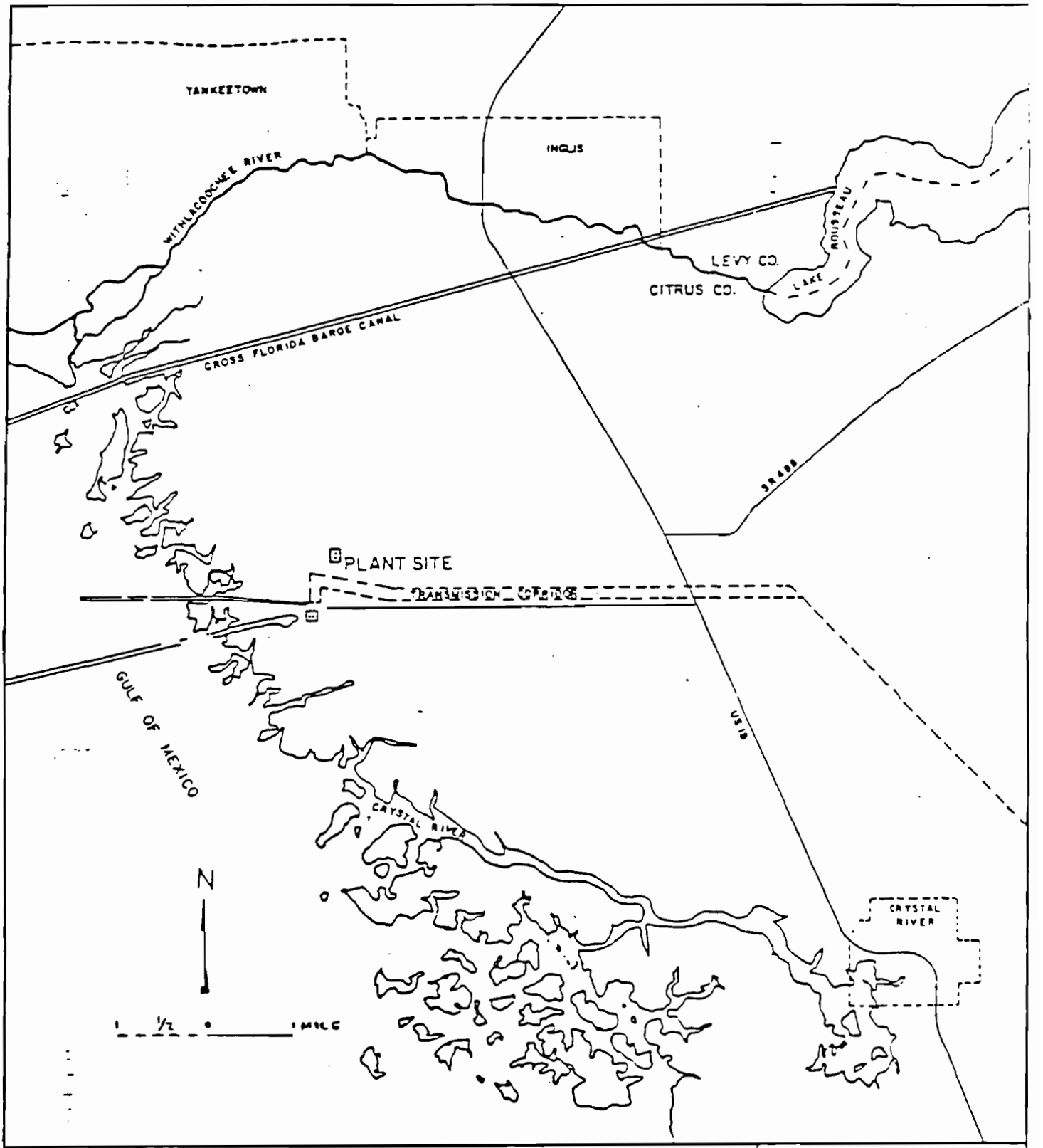
KEY PLAN
WASTEWATER DISPOSAL

DRAWN BY	DRH
DATE	3-16-76
CHECKED	S. Wall
APPROVED	[illegible]
SCALE	

DWG. NO. CR-CC-G9-A-2

FLORIDA POWER CORPORATION

SYSTEM ENGINEERING DEPARTMENT

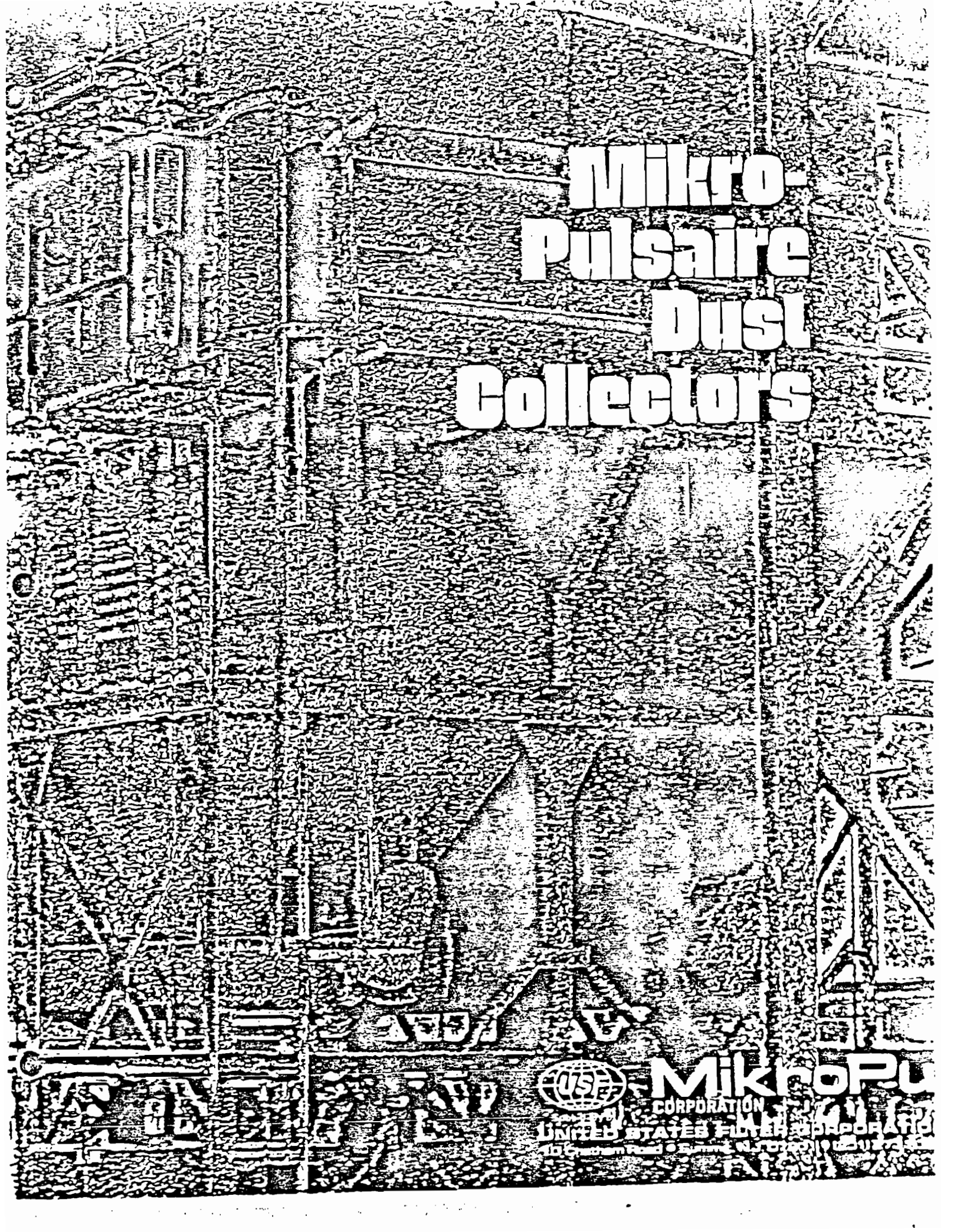


REVISIONS		
NO	DATE	

GENERAL AREA LOCATION MAP

DRAWN BY	S. MIKER
DATE	6-14-78
CHECKED	
APPROVED	
SCALE	

DWG. NO. CR-C3-A-0


Mikro-
Pulsaire
Dust
Collectors
MikroPu
CORPORATION

For Maximum Dust Recovery

Mikro-Pulsaire

The Mikro-Pulsaire dry filter collector combines high dust collection efficiency with very low maintenance. The unit is fully automatic and self cleaning. The unique design of the Mikro-Pulsaire has eliminated all moving parts thereby contributing to minimum maintenance and maximum efficiency of operation. All controls for the Mikro-Pulsaire are located on the outside of the unit.

Reverse Jet Operation

Basically the Mikro-Pulsaire consists of a series of cylindrical filter elements enclosed in a rugged, dust-tight fabricated metal housing. The contaminated, dust-laden air enters the housing through the hopper inlet. The dust particles accumulate on the filter elements. Periodically a momentary jet of high-pressure air is "pulsed" through a uniquely designed venturi nozzle located above each filter cylinder. The primary high-pressure jet pumps secondary air as a function of the jet pump method thereby producing a "reverse-flow" of air which cleans the filter cylinders. Continuous flow of air through the Mikro-Pulsaire is maintained at all times since only a small part of the filter element is cleaned at any given time. The air jets are controlled by diaphragm valves which are activated by solenoid pilot valves and a timer.

Unique Features

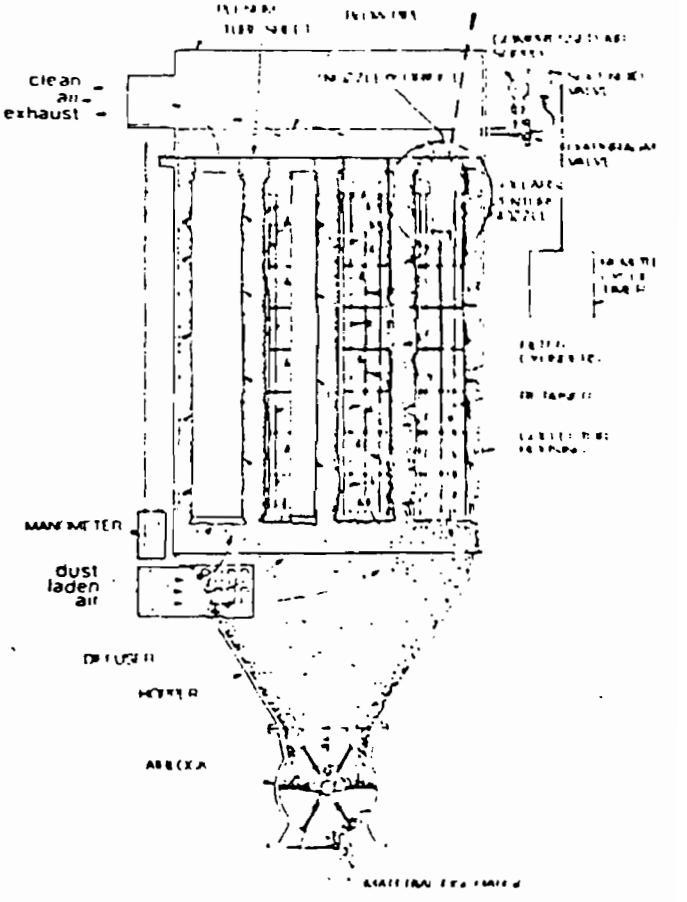
- High Dust Collection Efficiency . . . 99.9%
- Heavy Duty Construction . . . Minimum 14 Gauge
- No Internal Moving Parts
- Economical Installation . . . All Units Pre-wired
- Handles Dust Streams to 425° Fahrenheit. High temperature filter elements of DuPont "Nomex"* allows operation above most acid dew points. When extra resistance to chemicals is required DuPont Teflon* is also available for use in the filter elements.
- Installations World Wide . . . Over 60,000 installations throughout the world.
- Can be Used by Any Industry Having a Dry Dust Problem.

AVAILABILITY — All Mikro-Pulsaires can be supplied in three styles:

A Style — Plenum only
B Style — Plenum and Housing
C Style — Plenum, Housing and Hopper

Original MikroPul Venturi

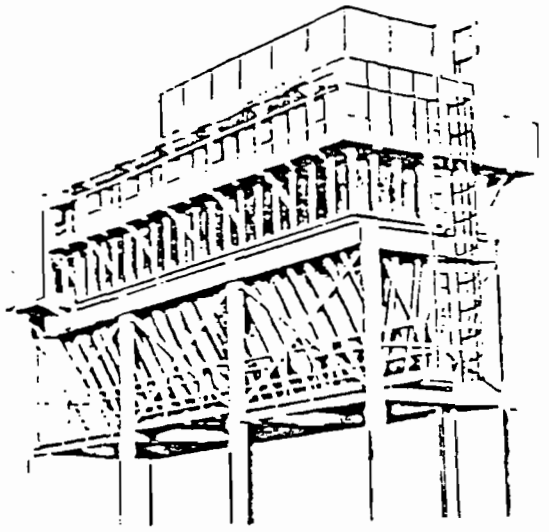
This venturi provides maximum efficiency to the filter media and is standard equipment of all Mikro-Pulsaire dust collectors.



Schematic diagram showing the flow of dust and air and the arrangement of filter cylinders in the Mikro Pulsaire Dust Collector.

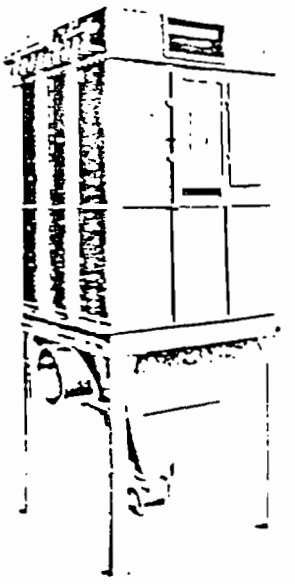
Mikro Pulsaire is originated and manufactured solely by Mikropul Corporation

YOUR DUST CONTROL PROBLEM



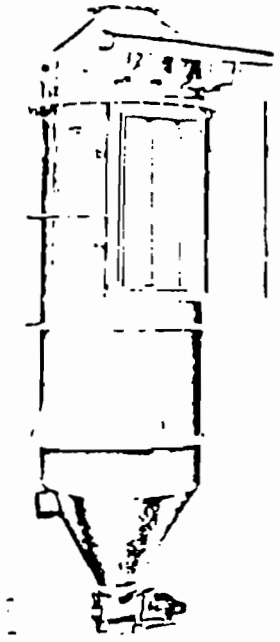
Modular Mikro-Pulsaire

Field-erected. Designed for the big jobs. Modular sections are readily combined for unlimited filtering capacity.



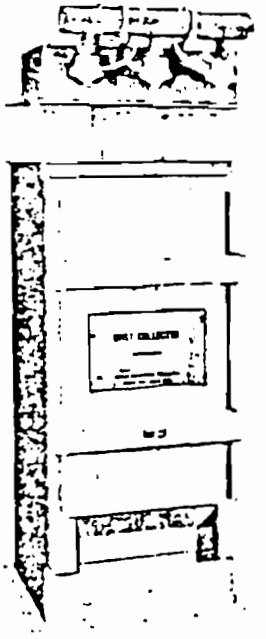
Pre-Assembled Mikro-Pulsaire

Factory-assembled. Wide range of sizes from 16 to 144 filter bags. Bags are 8 and 10 ft. long.



Cylindrical Mikro-Pulsaire

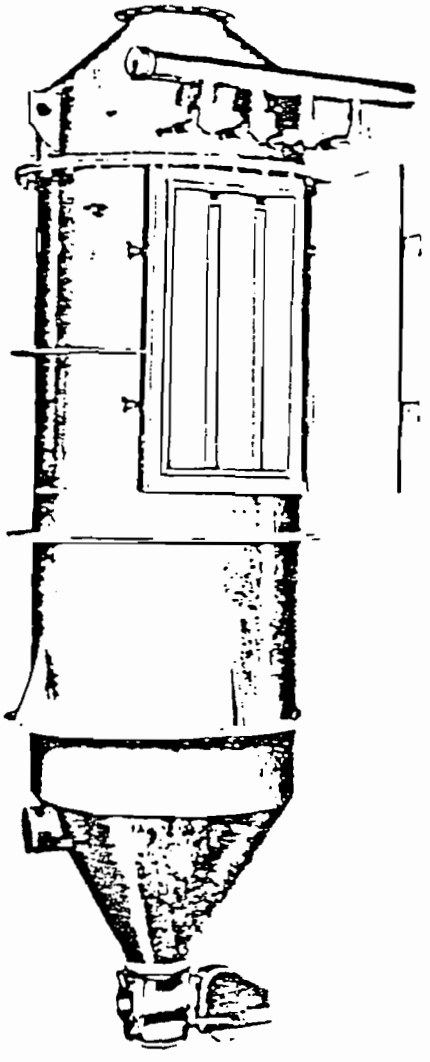
Compact, rugged round housing. Ratings standards — up to 100" H_2O and up to 220" H_2O.



Bin-Vent Unit Mikro-Pulsaire

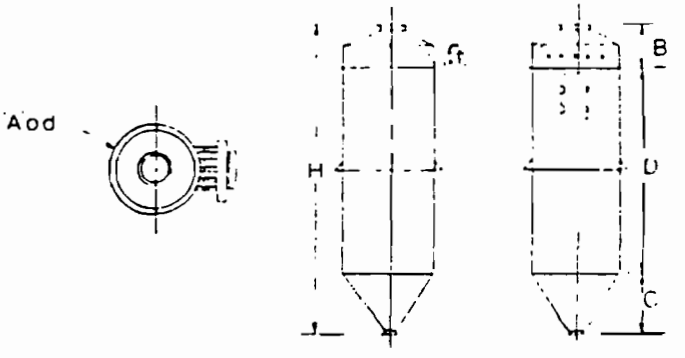
Mounts directly on receiver bins. Available with 25, 42, 63 and 84 sq. ft. of filter surface.

Cylindrical Mikro-Pulsaire



Cylindrical Housing Designed For A Wide Range Of Processing Applications

The Cylindrical Mikro-Pulsaire is factory assembled. It is fabricated of heavy duty 12 gauge steel. Available in sizes ranging from 12 to 109 filter bags. Bags are 8 and 10 feet long. This unit offers optimum space saving efficiency with maximum cloth area per square foot of floor space. The Cylindrical Mikro-Pulsaire is being successfully used in a broad field of industrial processes including spray drying, separating, mixing, cardoading and many other processes requiring the recovery of materials or the control of dust problems.



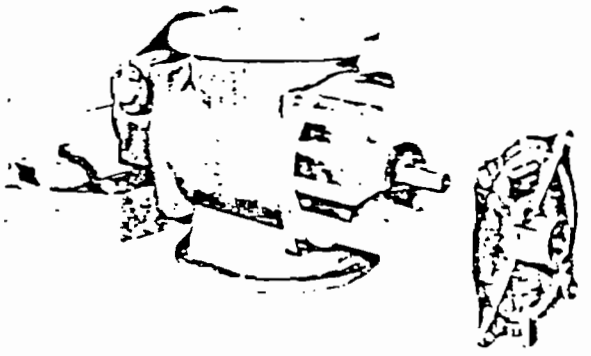
Specifications

Cylindrical Series

8 Ft. and 10 Ft. Filter Tubes

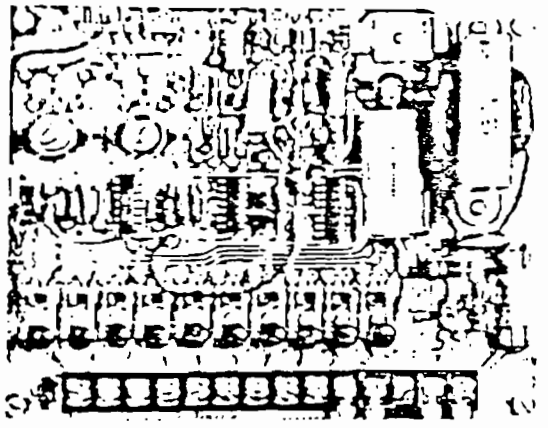
Model	12		19		23		31		42		55		69		85		97		109	
	-8-160	-10-160	-8-130	-10-130	-8-105	-10-105	-8-70	-10-70	-8-55	-10-55	-8-40	-10-40	-8-30	-10-30	-8-30	-10-30	-8-20	-10-20	-8-20	-10-20
Number of Filter Tubes	12	12	19	19	23	23	31	31	42	42	55	55	69	69	85	85	97	97	109	109
Filter Area Ft.²	113	141	178	224	216	271	292	366	394	495	518	649	649	812	800	1001	914	1142	1026	1283
Approx. Wt. in lbs.	850	930	1060	1075	1175	1300	1300	1450	1625	1800	1950	2150	2500	2725	2700	3000	3375	3650	3375	3650
Dim. A inches	30	30	36	36	42	42	48	48	54	54	60	60	72	72	72	72	84	84	84	84
Dim. C inches	19½	19½	24½	24½	31½	31½	37½	37½	43½	43½	49½	49½	56½	56½	56½	56½	68½	68½	68½	68½
Dim. B inches	10½	14½	17½	17½	18½	18½	18½	18½	20½	20½	21½	21½	24½	24½	27½	27½	28½	28½	27½	27½
Dim. D inches	108	132	108	132	108	132	108	132	108	132	108	132	108	132	108	132	108	132	108	132
Dim. H inches	138½	162½	150½	174½	157½	181½	162½	186½	169½	193½	175½	199½	188½	212½	187½	211½	200½	224½	200½	224½

MIKRO-PULSAIRE ACCESSORIES



Mikro-Airlock

The Mikro-Airlock is a precision-built rotary valve for continuous discharge from dust collectors, cyclones, pulverizers, blenders, mixers, screw conveyors, and storage bins. It is ideal for feeding pulverizers, pneumatic conveying systems, mixers, and blenders. The Mikro-Airlock is available in 8" and 14" sizes, for both high and low pressure applications. Metal, rubber and plastic rotor vanes are available.



Model 72
Integrated Cyclic Timer

The Model 72 Integrated Cyclic Timer is an all solid state sequential type, capable of switching 10 independent outputs. Each output has a switching capacity of one amp at 115 V. It is mounted on a glass reinforced circuit board. All timers are completely wired for ten outputs as received.

It is reliable for millions of cycles of operation and eliminates mechanical or electrical problems common to mechanical timers or relays.

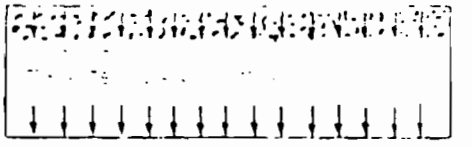
HCE Treated Felt Filter Media

MikroPul pioneered the use of advanced, more efficient filter media to meet the increasingly higher temperature requirements. A patented HCE treatment further adds to the dust collection efficiency of all filters used in the Mikro-Pulsaire.

Cost, efficiency, physical conditions — such as temperature and humidity — and chemical compatibility with both solid and gas streams should be considered in selecting the proper filter medium.

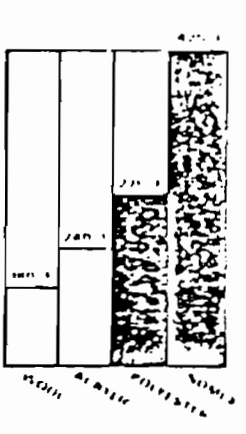
The following filter materials are available for use in the Mikro-Pulsaire:

1. Wool Felt, for temperatures to 180°F.
2. Polypropylene, for temperatures to 200°F.
3. Acrylic, for temperatures to 240°F.
4. Polyester, for temperatures to 275°F.
5. Nomex Felt, which will handle effluents to 425°F.
6. Teflon filter bags can be supplied for special chemical applications.



Felt Media

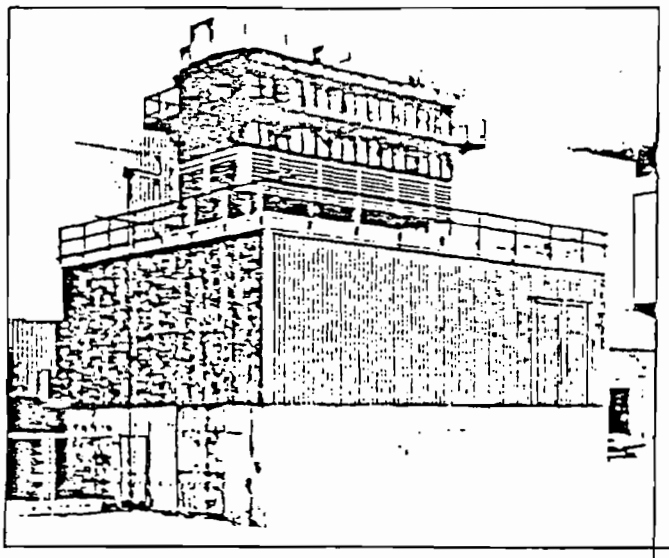
Dense felt that excludes submicron particles will filter air at a far higher rate than woven cloth when high pressure cleaning jets are used. Drawing above illustrates heavily matted texture of felt that traps particles while a uniform volume of air flows through.



"NOMEX" For High Temperatures to 425°F

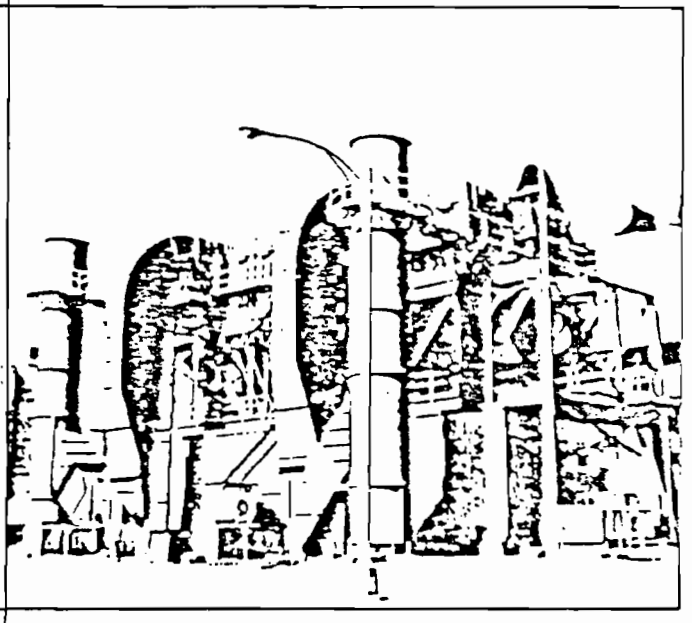
Nomex is a continuous filament yarn specially developed by DuPont to meet the need for an industrial fiber with good heat-resistant characteristics. MikroPul offers this outstanding material in felted filter bags 12" and under. Unlike fragile glass cloth elements, it can be twisted, folded or pulled in any direction. Shipped, handled and installed with only normal care . . . all without damage.

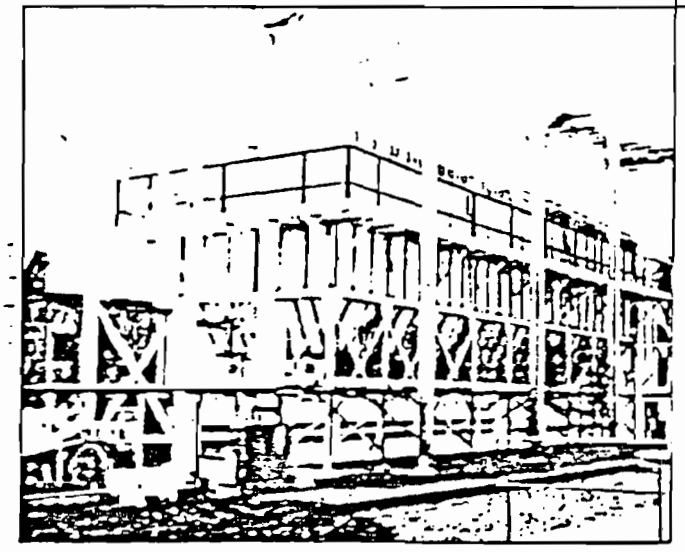
More Efficiently And Economically



◊Atmospheric Air Cleaning

◊Cement Industry

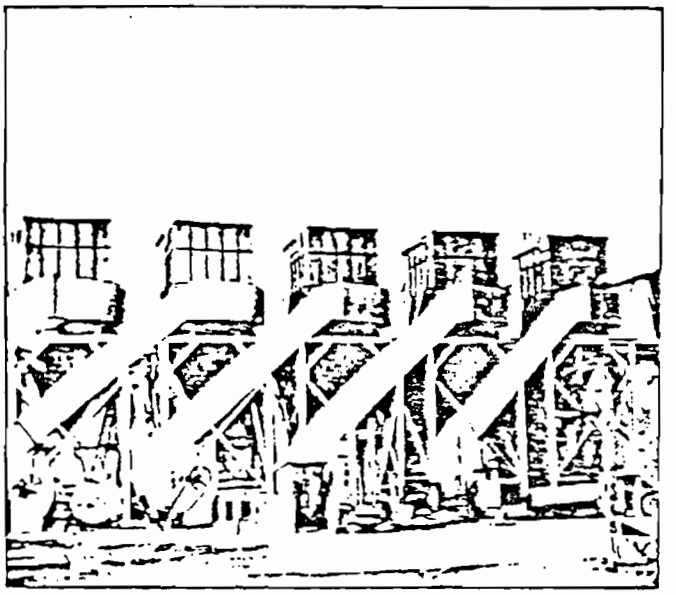




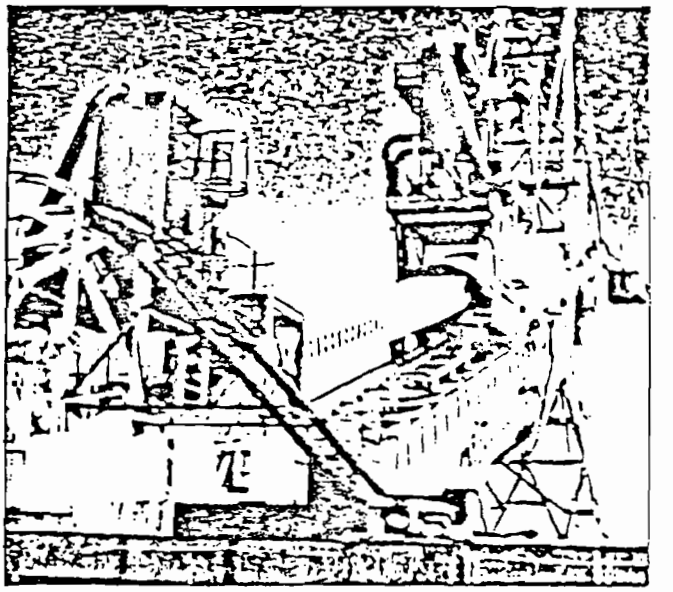
◊Materials Handling

A Variety of Fields

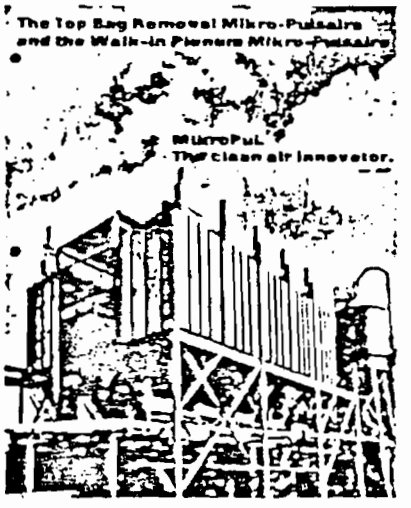
Woodworking Industry

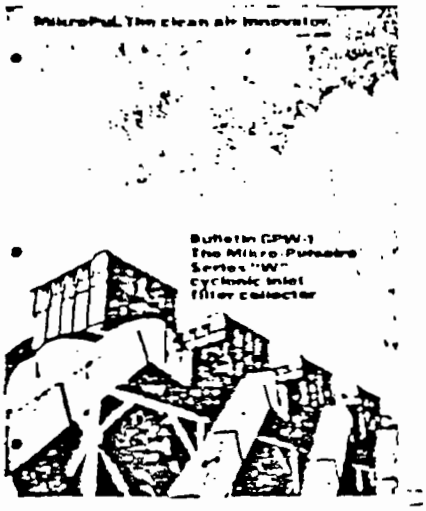


Nuisance Venting



Other Mikro-Pulsaires Are Available...





The Top Bag Removal and Walk-In Plenum Units along with the series "W" Filter Collectors are also available from MikroPul. For detailed information covering these units write for catalogs TRP-1 and GPW-1.

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

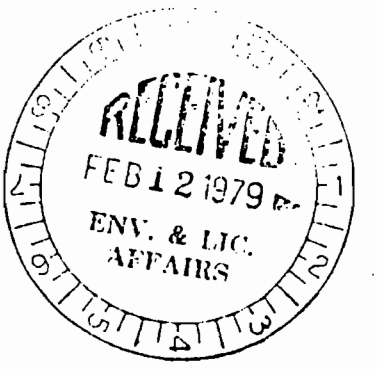
Bob Graham
GOVERNOR

Victoria Tschinkel
Acting SECRETARY

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

February 7, 1979



Mr. N.B. Spake, Vice President
Florida Power Corporation
P. O. Box 14042
St. Petersburg, Florida 33733

Dear Mr. Spake:

Subject: Best Available Control Technology (BACT) Determination for Crystal River Units 1 and 2 Fly-Ash Handling System, FPC, Citrus County

The Department of Environmental Regulation has reviewed the BACT application submitted by you, and determined Best Available Control Technology for the above referenced source, as follows:

	Particulate lbs/hr.
Unit 1 conveying line	3.52 Attainable with 99.9+% efficient bag dust collector
Transfer silo vent	0.03 Attainable with 99.9+% efficient bag dust collector
Storage silo vent	0.59 Attainable with 99.9+% efficient bag dust collector

Opacity: Less than 5%

Test Method: EPA's methods 1-5 as described in the August 17, 1977 Federal Register.

The complete BACT documents are attached.

Sincerely

Victoria Martinez
BACT Coordinator

VM:es
attachment

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

Source Type: [x] Air Pollution [ ] Incinerator

Application Type: [ ] Construction [ ] Operation [X] Modification [ ] Renewal of DER Permit No. _____

Company Name: Florida Power Corporation County: Citrus

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): Units 1 & 2 Fly Ash (Bag Filter - 2C Precipitator) Source 4

Source Location: Street: West of U.S. 19 City: Crystal River

UTM: East 334212.51 E North 3204252.405 N

Latitude: ___ ___ ° ___ ___ ' ___ ___ "N. Longitude: ___ ___ ° ___ ___ ' ___ ___ "W.

Appl. Name and Title: _____

Appl. Address: P. O. Box 14042 St. Petersburg, Florida 33733

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative of* Florida Power Corporation

I certify that the statements made in this application for a Construction (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 provisions 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 nontransferable and I will promptly notify the Department upon sale or legal transfer of the permitted establishment.

William S. O'Brien

Name of Person Signing (please Type or Print)

Signature of the Owner or Authorized Representative and Title

Date: _____ Telephone No.: _____

*Attach a letter of authorization.

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA

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 judgement, that 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 the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollutive sources.

Signature: J. S. Pachul

Name: J. S. Pachul
(Please Type)

Company Name: Florida Power Corporation

Florida Registration Number: 19325

(Affix Seal)

Mailing Address: P. O. Box 14042
St. Petersburg, Florida 33733

Telephone No.: 813 - 866-5151

Date: June 8, 1979

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 Attachment A of Construction Permit Application for Unit 2 Bag Filter (Source 4)

B. Schedule of Project Covered in this Application (Construction Permit Application Only).

Start of Construction: June 1979 Completion of Construction: October 1979

C. Costs of Construction. (Note: show breakdown of estimated costs only for individual components/units of the project serving pollution control purpose. Information on actual costs shall be furnished with the application for operation permit.)

Bag Filter: $21,000

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

E. Is the emission point considered to be a New* or Existing* source, as defined in Chapter 17-2.02(5) & (6), Florida Administrative Code?
X New ____ Existing

F. Is this application associated with or part of a Development of Regional Impact (DRI) pursuant to Chapter 380, Florida Statutes, and Chapter 22F-2, Florida Administrative Code? ____ Yes X No

G. Normal Equipment Operating Time: hrs/day: 24 ; days/wk: 7 ; wks/yr: 52 ; if seasonal, describe: ____

*Note

New Source: any source which came into existence, began operation or construction, or received a permit for the latter on or after January 18, 1972.

*Existing Source: any source in existence, operating or under construction (or with a permit to construct) prior to January 18, 1972.

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES

(other than incinerators)

A. Raw Materials and Chemicals Used in Your Process:

Description	Utilization Rate lbs./hr.	Relate to Flow Diagram
Fly Ash	55,000	G on CR-L2-A-4

B. Process Rate:

1) Total Process Input Rate (lbs./hr.): 55,000

2) Product Weight (lbs/hr): 55,000

C. Airborne Contaminants Discharged:

Name of Contaminant	Actual Discharge*		Allowed Discharge Rate Per Ch. 17-2, F.A.C.**	Allowable Discharge*** (lbs./hr.)	Relate to Flow Diagram
	lbs./hr.	T/yr.			
Particulate	3.3*	14.4*	Process Wy-Table	28	
Note:	Actual	discharge	will not exceed	3.3 lb/hr	

* Includes a 50 percent safety factor above maximum actual emissions.

D. Control Devices:

Name and Type (Model and Serial No.)	Contaminant	Efficiency†	Range of Particles Size Collected (in microns)	Basis for Efficiency††
Mikro-Pul Corp.	Particulate	99.9	<1	Design Data
Mikro Pulsaire				
#55-8-FV				

*Estimate only if this is an application to construct.

**Specify units in accordance with emission standards prescribed within Section 17-2.04, F.A.C. (e.g. Section 17-2.04(6)(e)1.a. specifies that new fossil fuel steam generators are allowed to emit particulate matter at a rate of 0.1 lbs. per million BTU heat input computed as a maximum 2-hour average.)

***Using above example for a source with 260 million BTU per hour heat input: $\frac{0.1 \text{ lbs}}{\text{MMBTU}} \times \frac{260 \text{ MMBTU}}{\text{hr.}} = 26 \text{ lbs./hr.}$

†See Supplemental Requirements, page 5, number 2.

††Indicate whether the efficiency value is based upon performance testing of the device or design data.

E. Fuels:

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

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

Fuel Analysis:

Percent Sulfur: _____ Percent Ash: _____

Density: _____ lb./gal.

Heat Capacity: _____ BTU/lb. _____ BTU/gal.

Other Fuel Contaminants: _____

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:

_____

_____

_____

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

Stack Height: 8 ft. Stack Diameter: 10 inches ft.

Gas Flow Rate: 1887 ACFM Gas Exit Temperature: 200 °F

Water Vapor Content: 0 %

SECTION IV: INCINERATOR INFORMATION

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.)
Lbs./Hr. Incinerated							

Description of Waste: _____

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

Approximate Number of Hours of Operation per Day: _____ , days/week: _____

Manufacturer: _____

Date Constructed: _____ Model No.: _____

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

Stack Height: _____ ft. Stack Diameter: _____ Stack Temp.: _____ °F

Gas Flow Rate: _____ ACFM _____ DSCFM*

*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 Device: _____

Ultimate Disposal of Any Effluent Other Than That Emitted From the Stack (scrubber water, ash, etc.): _____

SECTION V: SUPPLEMENTAL REQUIREMENTS

Please Provide the Following Supplements Required For All Pollution Sources:

1. Total process input rate and product weight - show derivation. See Attachment B
2. Efficiency estimation of control device(s) - show derivation. *Include pertinent test and/or design data.* See Attached Literature
3. An 8½" 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. See Drawing CR-L2-A-4
4. An 8½" x 11" plot plan of facility showing the exact location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram. See Drawing CR-CC-G9-A-2
5. An 8½" x 11" plot plan showing the exact 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 USGS topographic map.) See Drawing CR-L3-A-0
6. Description and sketch of storm water control measures taken both during and after construction.
7. An application fee of $20.00, unless exempted by Chapter 17-4.05(3), FAC, made payable to the Department of Environmental Regulation.
8. With construction permit application, include design details for control device(s). Example: for baghouse, include cloth to air ratio; for scrubber, include cross-sectional sketch; etc. See Attached Literature
9. Certification by the P.E. with the operation permit application that the source was constructed as shown in the construction permit application.

EXHIBIT A

CRYSTAL RIVER UNIT 2
FLY ASH HANDLING SYSTEM
PRECIPITATOR MODIFICATION

Subsequent to the Unit 2 coal conversion, the air quality control requirements for the Crystal River site resulted in the need for designing to a lower than originally anticipated sulphur content in the future coal supply for Crystal River Unit 2. This requirement combined with inadequacy of the initial precipitator modification to achieve compliance with federal emission regulations resulted in the need to upgrade the Unit 2 precipitator capability. Consequently, the existing electrostatic precipitator will be modified by adding 13 new fields, and a new precipitator will be added. The total Unit 2 gas flow will be divided between the modified and the new precipitator.

Currently, the fly ash is evacuated from the existing Unit 2 precipitator and economizer hoppers by means of a dry vacuum produced by the dual jet hydroevactors using high pressure sea water. Along with the precipitator modification and addition, the existing Unit 2 dry fly ash system will be changed such that the vacuum required to draw ash from the precipitator (2A, 2B & 2C) will be produced by vacuum blowers (as currently on Unit 1) and not by the hydroveyors. The hydroveyors will be left to serve as a back-up. The two new bag filters are identical, and are similar to that on Unit 1. Listed below is the technical information and specifications applicable to each of the two new bag filters:

Source 4 & 5

Efficiency - 99.9+%

Cost - $21,000

Supplier - United Conveyor Corporation

Manufacturer - Mikro-Pul Corporation

Name - Mikro-Pulsaire

Model - #55-8-FV

Blower exhaust diameter - 10 inches

Blower exhaust height - 8 feet

Air to cloth ration - 3.64 ACFM/ft.^{2}

Air flow rate - 1887 ACFM

Area of filtering media - 518 ft.^{2}

Velocity - 3186 ft/min.

Process weight - 27.5 tons ash per hour

Actual discharge - 2.2 lbs. per hour or 9.6 tons per year

EXHIBIT B

CALCULATION SHEET

ASH HANDLING SYSTEM AIRBORNE CONTAMINANTS

CRYSTAL RIVER UNIT 2 PRECIPITATOR MODIFICATION

Source 4: Precipitator 2C Conveying Line Bag Filter

27.5 tons per hour (max design) of ash is drawn from Unit 2 precipitator through the separator where 96% of the ash is removed and flows into the transfer silo. The remaining ash and air enter the bag filter where 99.9% of the ash is removed with the air exhausted through the vacuum blower. Actual discharge estimate based on 96% efficient separators and 99.9% efficient bag filter.

Process Weight

Design fly ash rate from Unit 2 precipitator	27.5 tons per hour

Actual Discharge

27.5 TPH x 0.04 x 0.001	2.2 lbs. per hour 9.6 tons per year

Source 5: Precipitator 2A & 2B Conveying Line Bag Filter

27.5 tons per hour (max design) of ash is drawn from Unit 2 precipitator 2A & 2B through the separator where 96% of the ash is removed and flows into the transfer silo. The remaining ash and air enter the bag filter where 99.9% of the ash is removed with the air exhausted through the vacuum blower. Actual discharge estimate based on 96% efficient separators and 99.9% efficient bag filter.

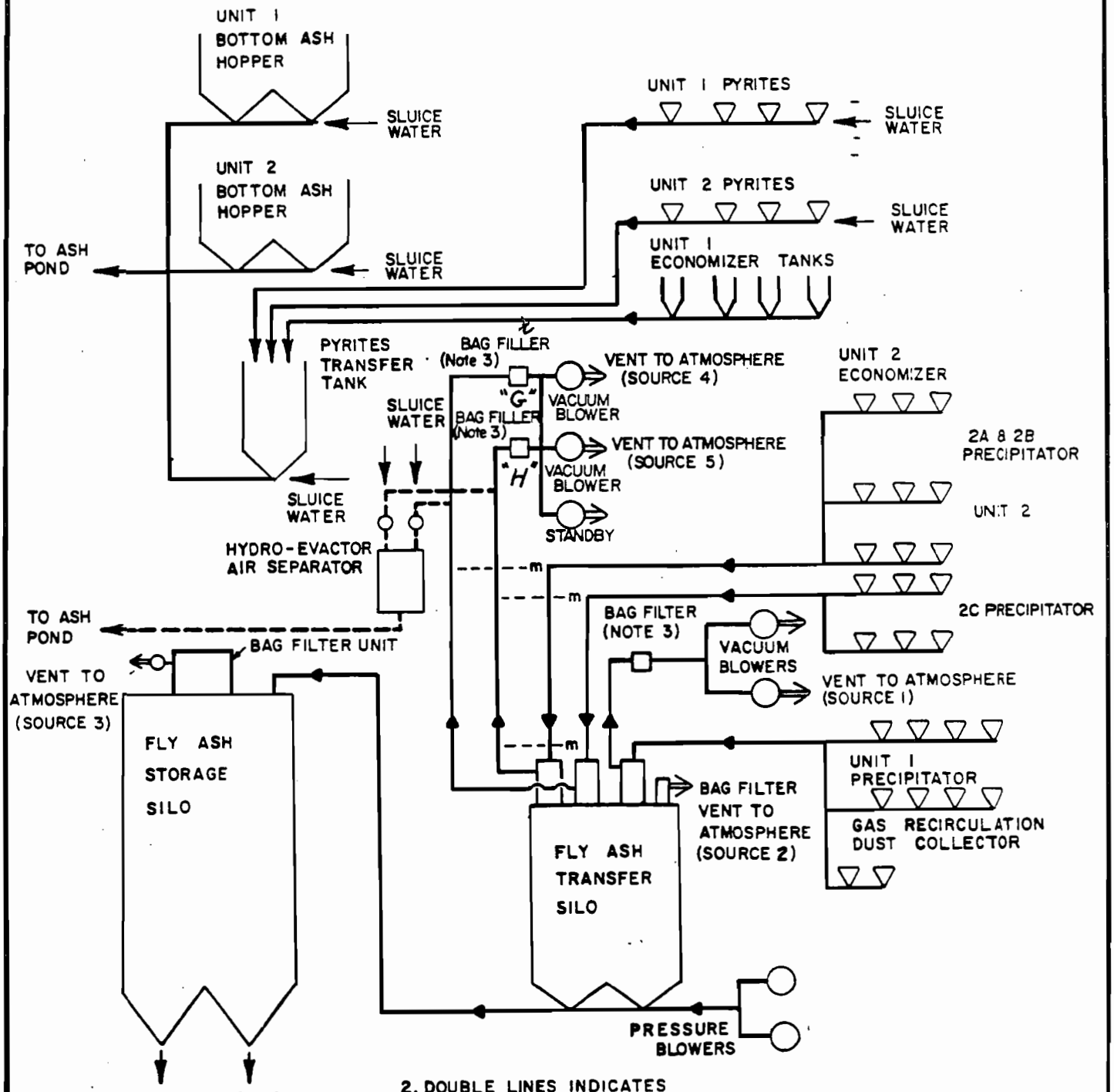
Process Weight

Design fly ash rate from Unit 2 precipitator	27.5 tons per hour

Actual Discharge

27.5 TPH x 0.04 x 0.001	2.2 lbs. per hour 9.6 tons per year

FLORIDA POWER CORPORATION
SYSTEM ENGINEERING DEPARTMENT



NOTE:

1. DOTTED LINE INDICATES EMERGENCY FLY ASH DISPOSAL.
2. DOUBLE LINES INDICATES VENTED CONVEYING AIR
3. BAG FILTER DISCHARGES ASH TO TRANSFER SILO DISCHARGE

REVISIONS		
NO.	DATE	
1	2-28-78	ADDED VENTS
2	5-9-78	RELOCATE VENTS
3	6-20-78	ADDED DETAILS
4	2-20-78	2C PRECIPITATOR SYST'M.

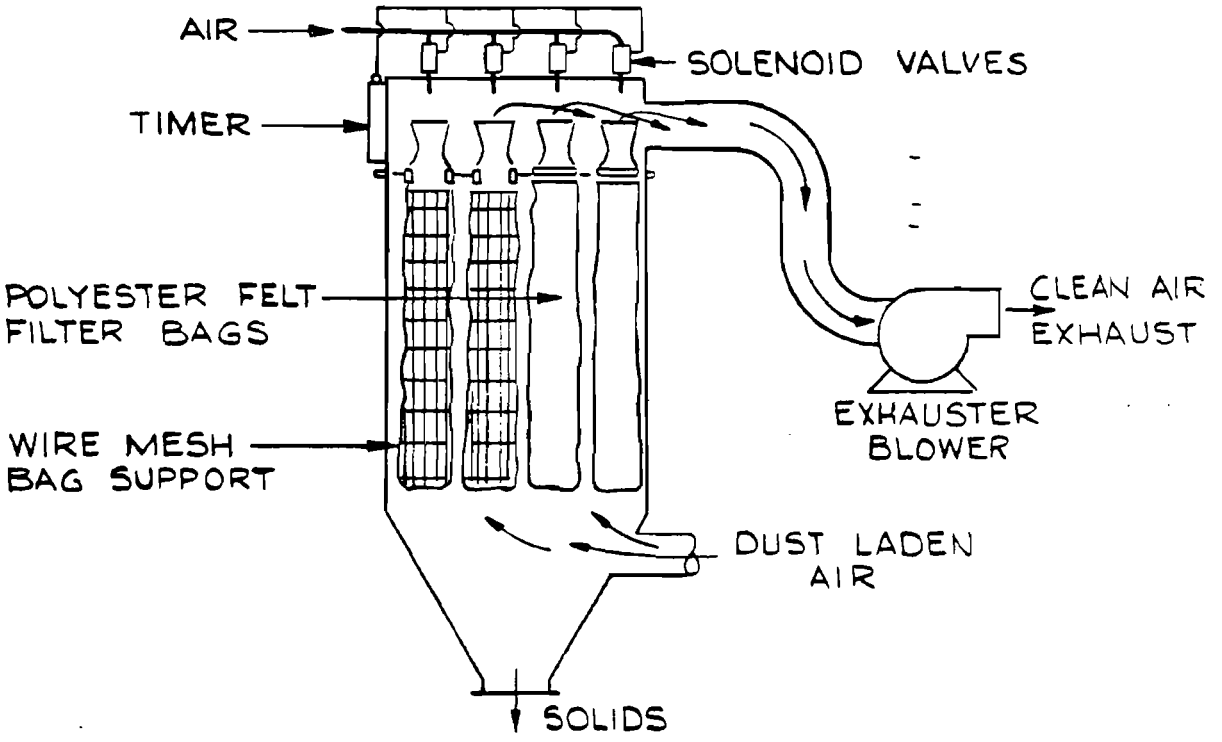
CRYSTAL RIVER UNITS 1 & 2

ASH HANDLING SYSTEM
COAL CONVERSION

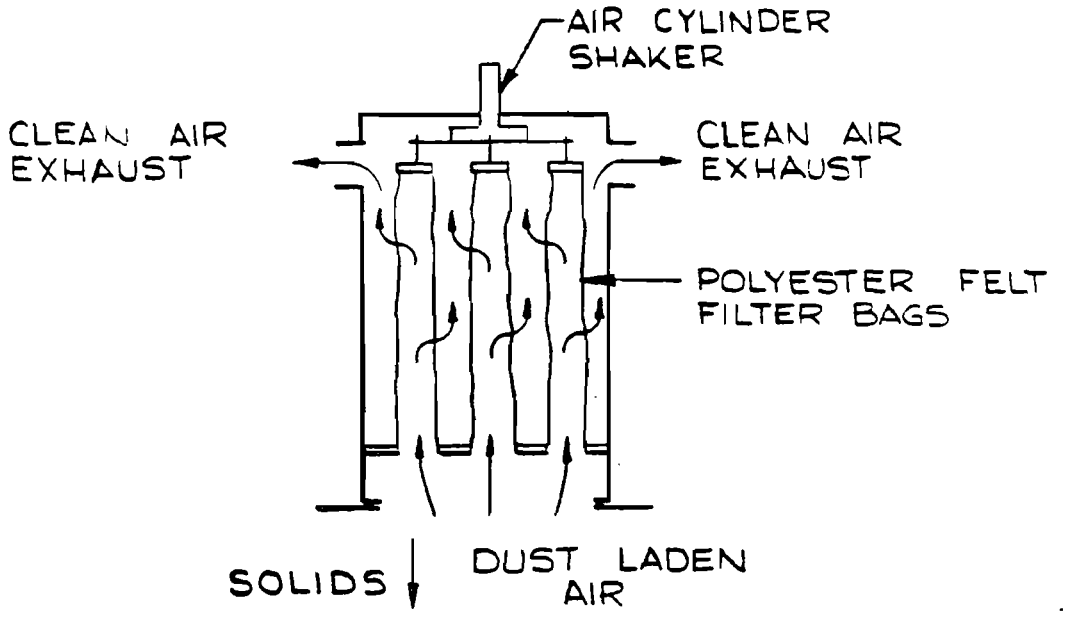
DRAWN BY	Vbeau
DATE	10-6-77
CHECKED	
APPROVED	
SCALE	Not Shown

DWG. NO. CR-L2-A-4

FLORIDA POWER CORPORATION
SYSTEM ENGINEERING DEPARTMENT



SOURCE 1 & 3,4 & 5



SOURCE 2

REVISIONS		
NO.	DATE	

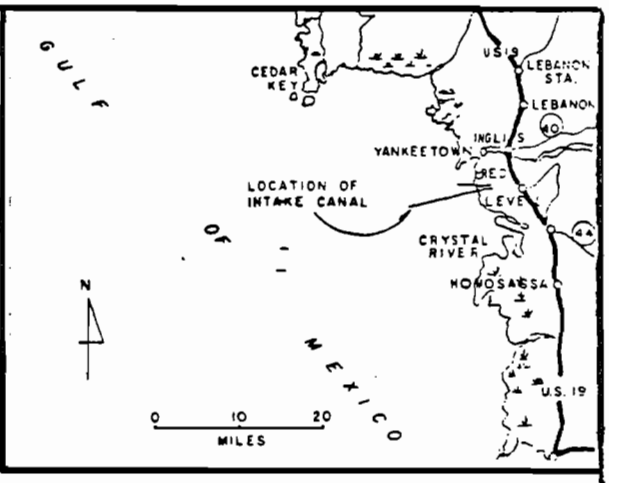
CR-CC Fly Ash Handling System Bag Filter Unit Schematic

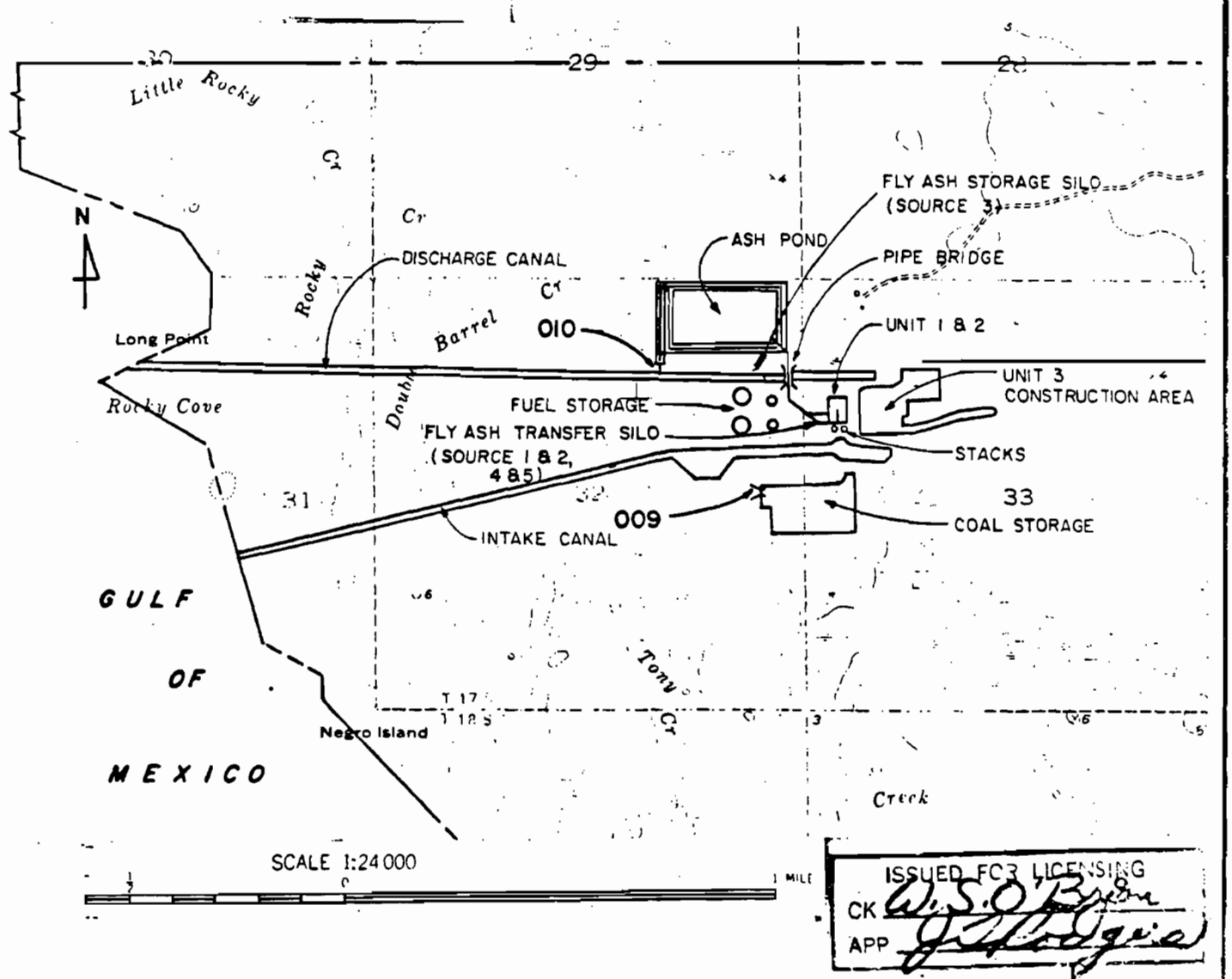
DRAWN BY	RJBetts
DATE	6/22/78
CHECKED	
APPROVED	
SCALE	NONE

DWG. NO. CR 1&2-L4-A-0

K&E 17 0183 9-78 MC40F4

FLORIDA POWER CORPORATION
SYSTEM ENGINEERING DEPARTMENT





ISSUED FOR LICENSING
CK W.S.O'Brien
APP

REVISIONS		
NO.	DATE	
1	2/20/78	ADDED FLY ASH SILO
2	3/9/79	ADDED SOURCE 4 & 5

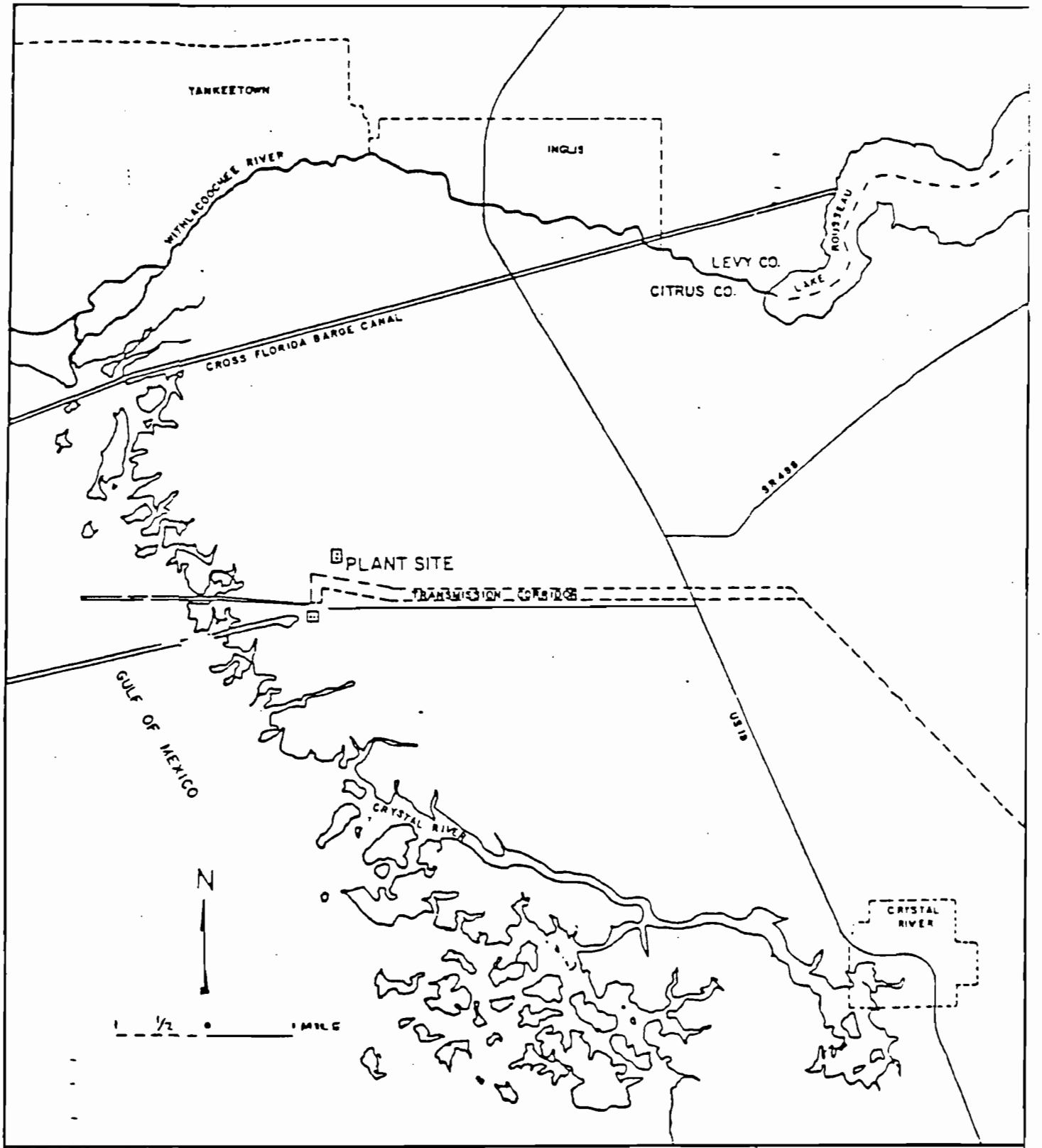
KEY PLAN
WASTEWATER DISPOSAL

DRAWN BY	DRH
DATE	3-16-76
CHECKED	
APPROVED	
SCALE	

DWG. NO. CR-CC-G9-A-2

FLORIDA POWER CORPORATION

SYSTEM ENGINEERING DEPARTMENT

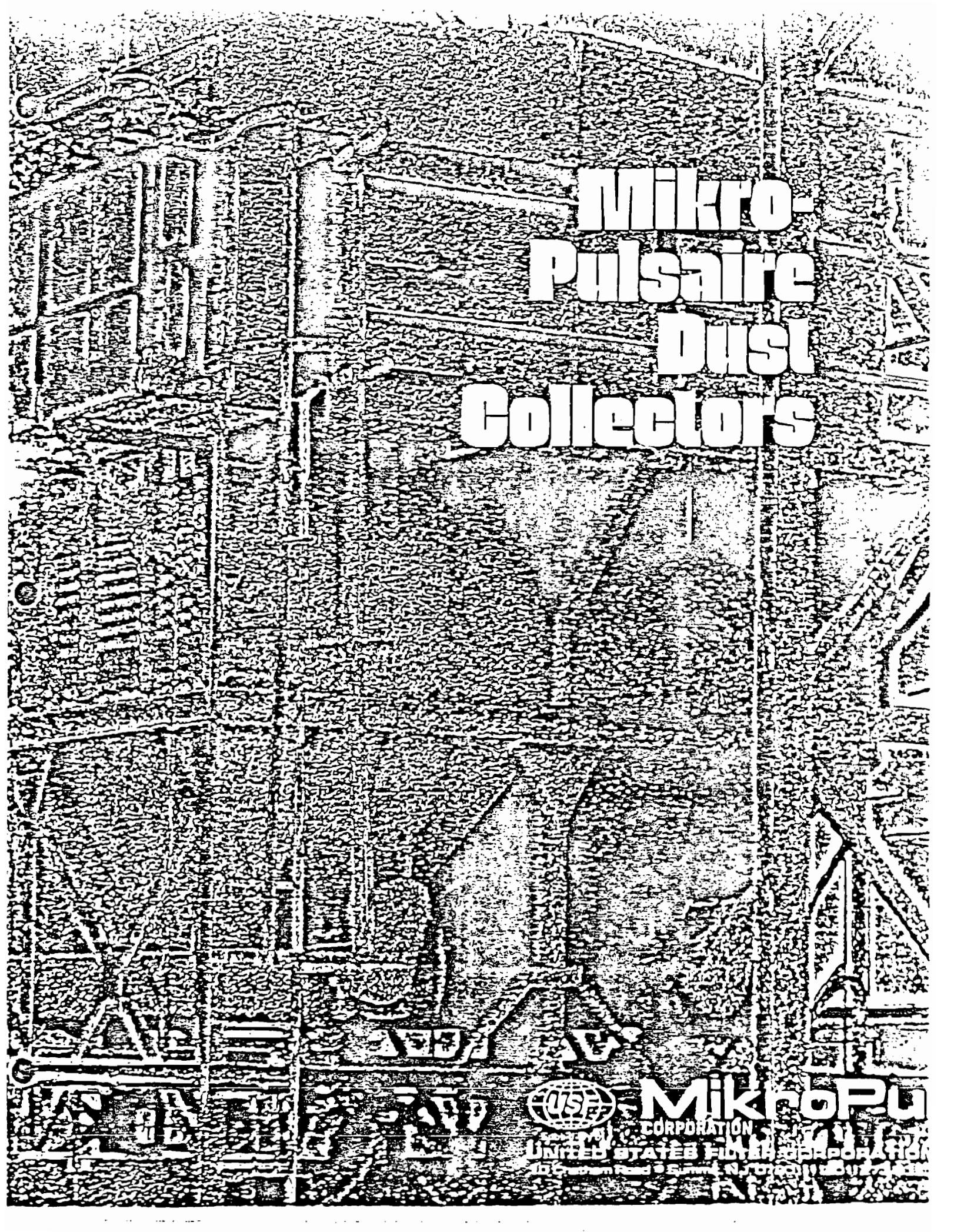


REVISIONS	
NO	DATE

GENERAL AREA LOCATION MAP

DRAWN BY	S MIKER
DATE	6-14-78
CHECKED	
APPROVED	
SCALE	

DWG. NO. CR-L3-A-0


Mikro-
Pulsaire
Dust
Collectors
MikroPu
CORPORATION

For Maximum Dust Recovery

Mikro-Pulsaire

The Mikro-Pulsaire dry filter collector combines high dust collection efficiency with very low maintenance. The unit is fully automatic and self cleaning. The unique design of the Mikro-Pulsaire has eliminated all moving parts thereby contributing to minimum maintenance and maximum efficiency of operation. All controls for the Mikro-Pulsaire are located on the outside of the unit.

Reverse Jet Operation

Basically the Mikro-Pulsaire consists of a series of cylindrical filter elements enclosed in a rugged, dust-tight fabricated metal housing. The contaminated, dust-laden air enters the housing through the hopper inlet. The dust particles accumulate on the filter elements. Periodically a momentary jet of high-pressure air is "pulsed" through a uniquely designed venturi nozzle located above each filter cylinder. The primary high-pressure jet pumps secondary air as a function of the jet pump method thereby producing a "reverse-flow" of air which cleans the filter cylinders. Continuous flow of air through the Mikro-Pulsaire is maintained at all times since only a small part of the filter element is cleaned at any given time. The air jets are controlled by diaphragm valves which are activated by solenoid pilot valves and a timer.

Unique Features

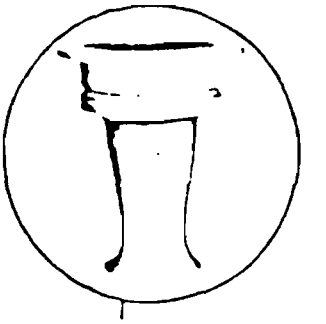
- High Dust Collection Efficiency . . . 99.9%
- Heavy Duty Construction . . . Minimum 14 Gauge
- No Internal Moving Parts
- Economical Installation . . . All Units Pre-wired
- Handles Dust Streams to 425° Fahrenheit. High temperature filter elements of DuPont "Nomex"* allows operation above most acid dew points. When extra resistance to chemicals is required DuPont Teflon* is also available for use in the filter elements.
- Installations World Wide . . . Over 60,000 installations throughout the world.
- Can be Used by Any Industry Having a Dry Dust Problem.

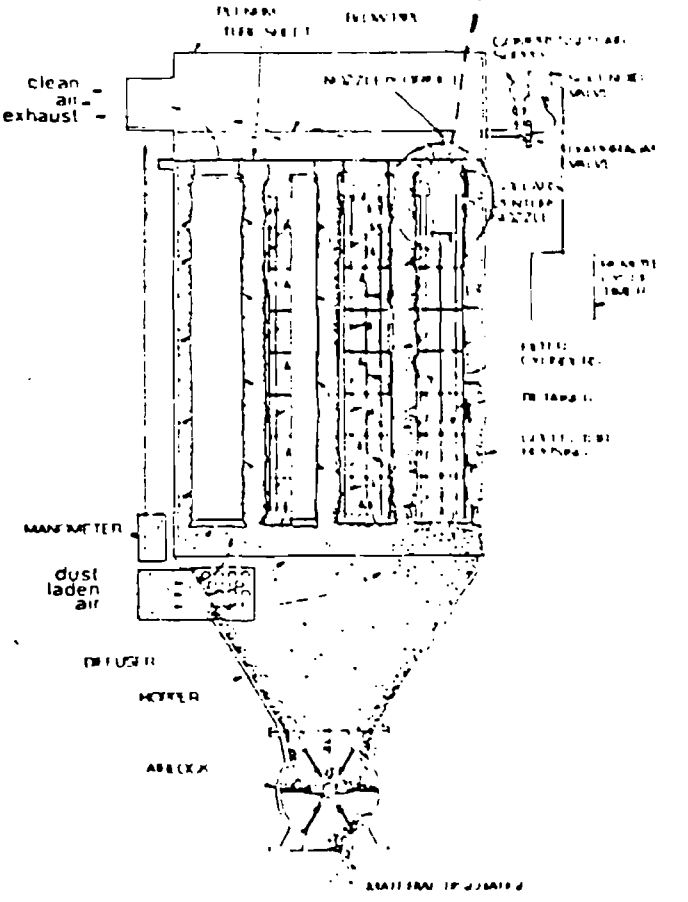
AVAILABILITY — All Mikro-Pulsaires can be supplied in three styles:

A Style — Plenum only
B Style — Plenum and Housing
C Style — Plenum, Housing and Hopper

Original MikroPul Venturi

This venturi provides maximum efficiency to the filter media and is standard equipment of all Mikro-Pulsaire dust collectors.

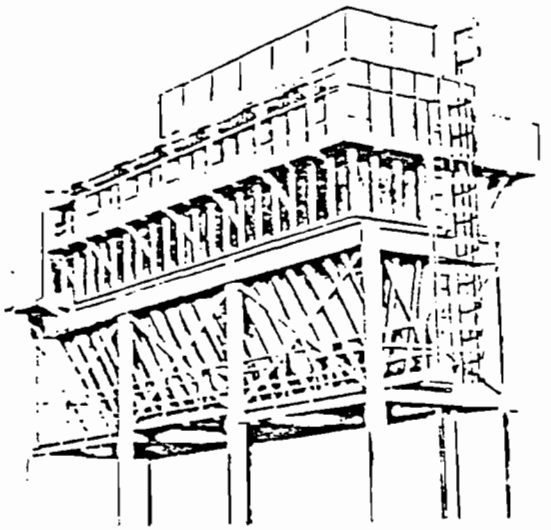




Schematic diagram showing the flow of dust and air and the arrangement of filter cylinders in the Mikro Pulsaire Dust Collector.

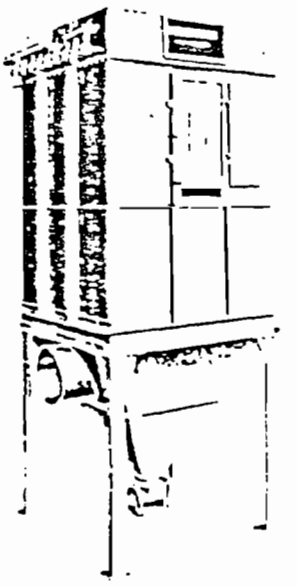
Mikro Pulsaire is originated and manufactured solely by MikroPul Corporation

Your Dust Control Problem



Modular Mikro-Pulsaire

Field-erected. Designed for the big jobs. Modular sections are readily combined for unlimited filtering capacity.

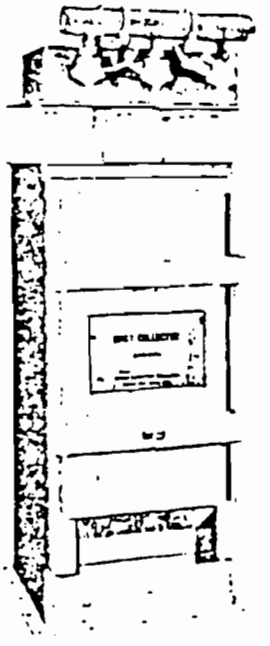


Pre-Assembled Mikro-Pulsaire

Factory-assembled. Wide range of sizes from 16 to 144 filter bags. Bags are 8 and 10 ft. long.

Cylindrical Mikro-Pulsaire

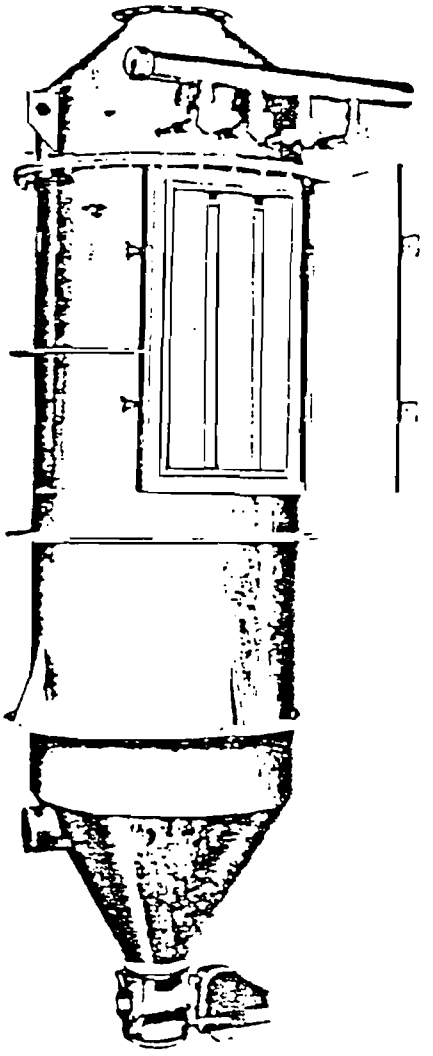
Compact, rugged round housing. Ratings standards — up to 100" H_2O and up to 220" H_2O.



Bin-Vent Unit Mikro-Pulsaire

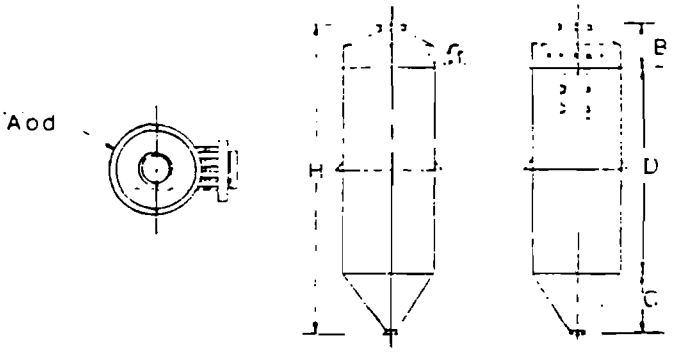
Mounts directly on receiver bins. Available with 25, 42, 63 and 84 sq. ft. of filter surface.

Cylindrical Mikro-Pulsaire



Cylindrical Housing Designed For A Wide Range Of Processing Applications

The Cylindrical Mikro-Pulsaire is factory assembled. It is fabricated of heavy duty 12 gauge steel. Available in sizes ranging from 12 to 109 filter bags. Bags are 8 and 10 feet long. This unit offers optimum space saving efficiency with maximum cloth area per square foot of floor space. The Cylindrical Mikro-Pulsaire is being successfully used in a broad field of industrial processes including spray drying, separating, mixing, carloading and many other processes requiring the recovery of materials or the control of dust problems.



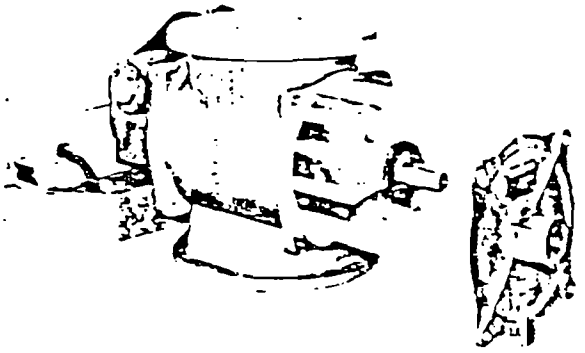
Specifications

Cylindrical Series

8 Ft. and 10 Ft. Filter Tubes

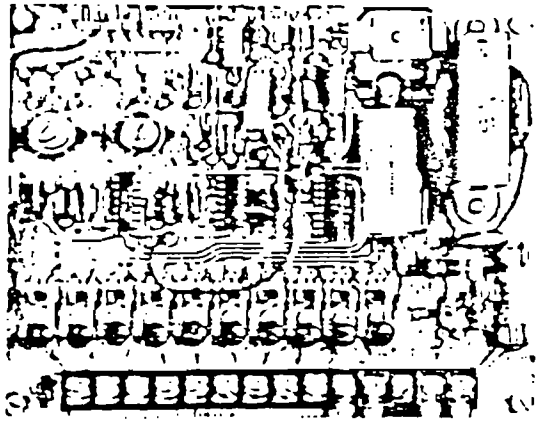
Model	12		19		23		31		42		55		69		85		97		109	
	-8-160	-10-160	-8-130	-10-130	-8-105	-10-105	-8-70	-10-70	-8-55	-10-55	-8-40	-10-40	-8-30	-10-30	-8-30	-10-30	8-20	-10-20	8-20	10-20
Number of Filter Bags	12	12	19	19	23	23	31	31	42	42	55	55	69	69	85	85	97	97	109	109
Filter Area Ft.	113	141	178	224	216	271	292	365	394	495	518	649	649	812	800	1001	914	1142	1026	1283
Approx. Wt. in lbs.	840	890	960	1075	1175	1300	1390	1490	1625	1800	1940	2150	2500	2725	2700	3000	3175	3500	3375	3700
Dim. A inches	30	30	36	36	42	42	48	48	54	54	60	60	72	72	72	72	84	84	84	84
Dim. C inches	19½	19½	24½	24½	31½	31½	37½	37½	43½	43½	49½	49½	55½	55½	55½	55½	61½	61½	61½	61½
Dim. B inches	16½	16½	17¾	17¾	18¾	18¾	19¾	19¾	20¾	20¾	21¾	21¾	24½	24½	23¾	23¾	25½	25½	25½	25½
Dim. D inches	108	132	108	132	108	132	108	132	108	132	108	132	108	132	108	132	108	132	108	132
Dim. H inches	136¼	167¼	150¼	174¼	157¼	181¼	167¼	186¼	169¾	193¾	175¾	199¾	188¼	212¼	187¼	211¼	200¼	224¼	200¼	224¼

Mikro-Pulsaire Accessories



Mikro-Airlock

The Mikro-Airlock is a precision-built rotary valve for continuous discharge from dust collectors, cyclones, pulverizers, blenders, mixers, screw conveyors, and storage bins. It is ideal for feeding pulverizers, pneumatic conveying systems, mixers, and blenders. The Mikro-Airlock is available in 8" and 14" sizes, for both high and low pressure applications. Metal, rubber and plastic rotor vanes are available.



Model 72
Integrated Cyclic Timer

The Model 72 Integrated Cyclic Timer is an all solid state sequential type, capable of switching 10 independent outputs. Each output has a switching capacity of one amp at 115 V. It is mounted on a glass reinforced circuit board. All timers are completely wired for ten outputs as received.

It is reliable for millions of cycles of operation and eliminates mechanical or electrical problems common to mechanical timers or relays.

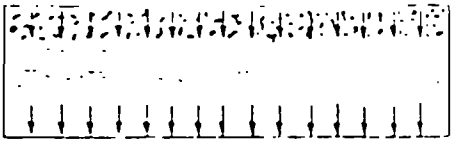
HCE Treated Felt Filter Medium

MikroPul pioneered the use of advanced, more efficient filter media to meet the increasingly higher temperature requirements. A patented HCE treatment further adds to the dust collection efficiency of all filters used in the Mikro-Pulsaire.

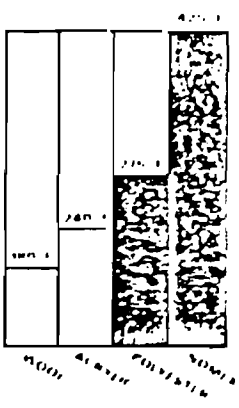
Cost, efficiency, physical conditions — such as temperature and humidity — and chemical compatibility with both solid and gas streams should be considered in selecting the proper filter medium.

The following filter materials are available for use in the Mikro-Pulsaire:

1. Wool Felt, for temperatures to 180 F.
2. Polypropylene, for temperatures to 200 F.
3. Acrylic, for temperatures to 240 F.
4. Polyester, for temperatures to 275 F.
5. Nomex Felt, which will handle effluents to 425 F.
6. Teflon filter bags can be supplied for special chemical applications.



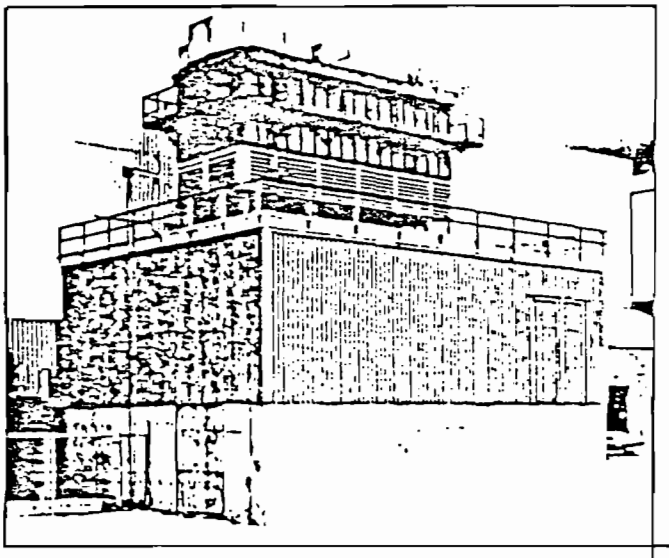
Felt Media
Dense felt that excludes submicron particles will filter air at a far higher rate than woven cloth when high pressure cleaning jets are used. Drawing above illustrates heavily matted texture of felt that traps particles while a uniform volume of air flows through.



"NOMEX" For High Temperatures to 425 F.

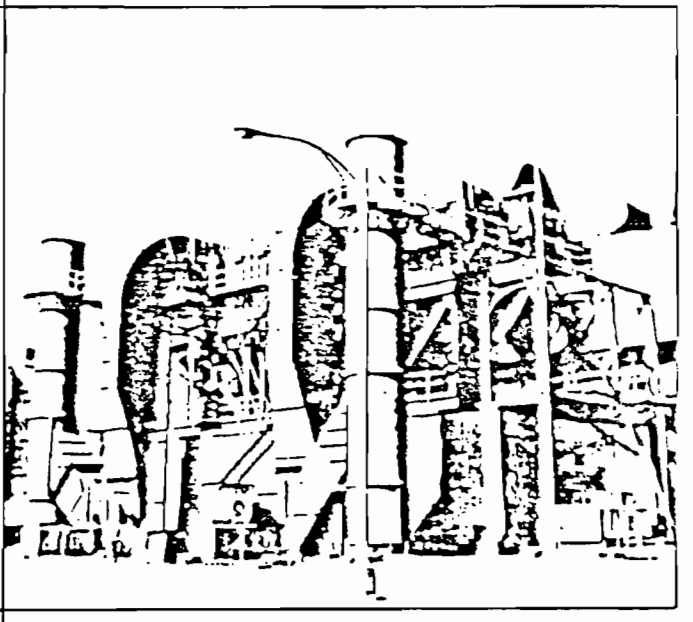
Nomex is a continuous filament yarn specially developed by DuPont to meet the need for an industrial fiber with good heat-resistant characteristics. MikroPul offers this outstanding material in felted filter bags — and unlike fragile glass cloth elements, it can be twisted, folded or pulled in any direction — shipped, handled and installed with only normal care . . . all without damage.

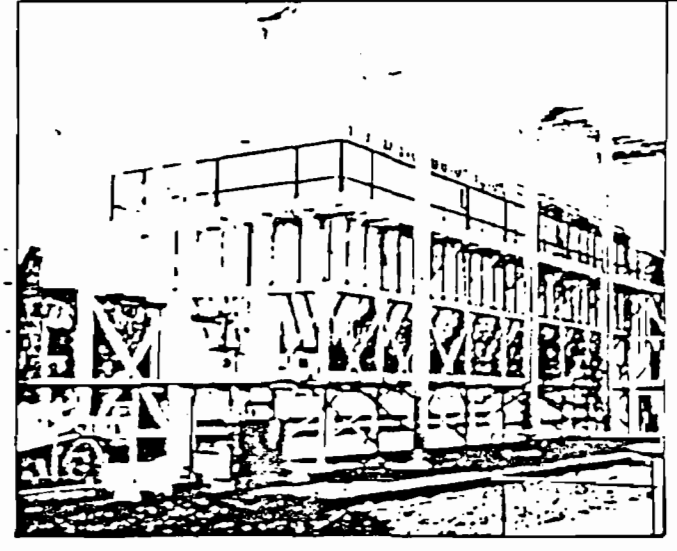
More Efficiently And Economically



◊Atmospheric Air Cleaning

Cement ◊ Industry

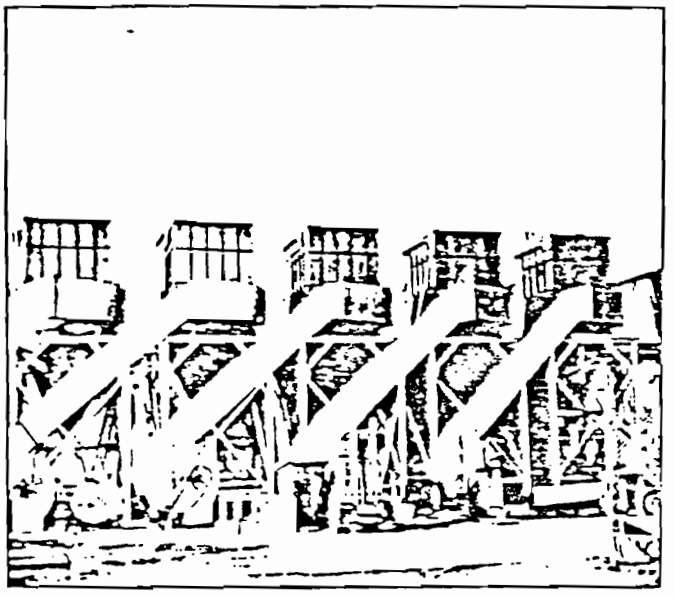




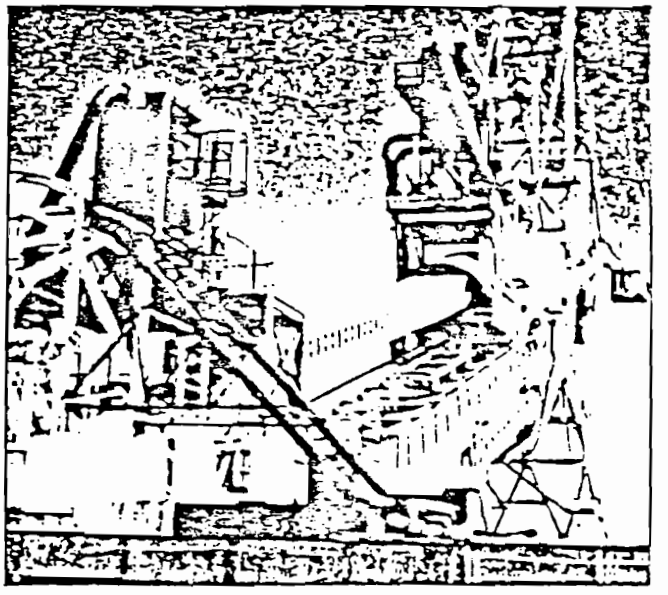
◊Materials Handling

A Variety of Fields

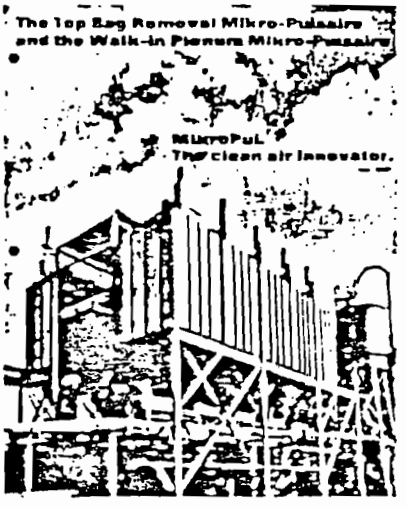
Woodworking Industry

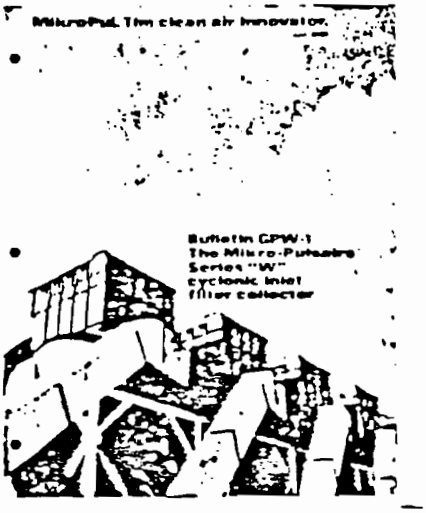


Nuisance Venting



Other Mikro-Pulsaires Are Available...





The Top Bag Removal and Walk-In Plenum Units along with the series "W" Filter Collectors are also available from MikroPul. For detailed information covering these units write for catalogs TRP-1 and GPW-1.

Florida Power
CORPORATION

October 16, 1978

TO WHOM IT MAY CONCERN

Subject: Letter of Authorization

Please be advised that Mr. W. S. O'Brien, Director, Environmental & Licensing Affairs, is authorized to represent Florida Power Corporation in matters relating to necessary permits required from regulatory authority in the areas of air, water and power plant site certification.

Very truly yours,

Ned B. Spake

Ned B. Spake
Vice President

NBS/db

State of Florida

DEPARTMENT OF STATE • DIVISION OF CORPORATIONS

I certify from the records of this office that FLORIDA POWER CORPORATION, is a corporation organized under the laws of the State of Florida.

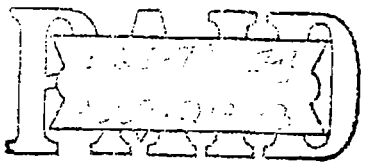
The charter number for this corporation is 142619.

I further certify that said corporation has filed all annual reports and paid all annual report filing fees due this office through December 31, 1978, and its status is active.

GIVEN under my hand and the Great Seal of the State of Florida, at Tallahassee, the Capital, this the 4th day of December, 1978.

SECRETARY OF STATE

CLR 101
9-21-78



STATE OF FLORIDA

SOUTHWEST DISTRICT
TAMPA

DEPARTMENT OF ENVIRONMENTAL REGULATION

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

Source Type: [X] Air Pollution [ ] Incinerator

Application Type: [ ] Construction [ ] Operation [X] Modification [ ] Renewal of DER Permit No. _____

Company Name: Florida Power Corporation County: Citrus

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): Units 1 & 2 Fly Ash (Bag Filter - 2A & 2B Precipitator) - Source 5

Source Location: Street: West of U.S. 19 City: Crystal River

UTM: East 334215.26 E North 3204249.053 N

Latitude: ___ ___ ° ___ ___ ' ___ ___ "N. Longitude: ___ ___ ° ___ ___ ' ___ ___ "W.

Appl. Name and Title: _____

Appl. Address: P. O. Box 14042 St. Petersburg, Florida 33733

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative of* Florida Power Corporation

I certify that the statements made in this application for a Construction (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 provisions 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 nontransferable and I will promptly notify the Department upon sale or legal transfer of the permitted establishment.

William S. O'Brien

Name of Person Signing (please Type or Print)

Signature of the Owner or Authorized Representative and Title

Date: _____ Telephone No.: _____

*Attach a letter of authorization.

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA

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 judgement, that 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 the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signature: J. S. Pachul

Name: J. S. Pachul
(Please Type)

Company Name: Florida Power Corporation

Florida Registration Number: 19325

(Affix Seal)

Mailing Address: P. O. Box 14042
St. Petersburg, Florida 33733

Telephone No.: 813 - 866-5151

Date: June 8, 1979

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 Attachment A of Construction Permit Application for Unit 2 Bag Filter (Source 5)

B. Schedule of Project Covered in this Application (Construction Permit Application Only).

Start of Construction: June 1979 Completion of Construction: October 1979

C. Costs of Construction. (Note: show breakdown of estimated costs only for individual components/units of the project serving pollution control purpose. Information on actual costs shall be furnished with the application for operation permit.)

Bag Filter: $21,000

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

E. Is the emission point considered to be a New* or Existing* source, as defined in Chapter 17-2.02(5) & (6), Florida Administrative Code?
X New ____ Existing

F. Is this application associated with or part of a Development of Regional Impact (DRI) pursuant to Chapter 380, Florida Statutes, and Chapter 22F-2, Florida Administrative Code? ____ Yes X No

G. Normal Equipment Operating Time: hrs/day: 24 ; days/wk: 7 ; wks/yr: 52 ; if seasonal, describe: ____

*Note

New Source: any source which came into existence, began operation or construction, or received a permit for the latter on or after January 18, 1972.

*Existing Source: any source in existance, operating or under construction (or with a permit to construct) prior to January 18, 1972.

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES

(other than incinerators)

A. Raw Materials and Chemicals Used in Your Process:

Description	Utilization Rate lbs./hr.	Relate to Flow Diagram
Fly Ash	55,000	H on CR-L2-A-4

B. Process Rate:

1) Total Process Input Rate (lbs./hr.): 55,000

2) Product Weight (lbs/hr): 55,000

C. Airborne Contaminants Discharged:

Name of Contaminant	Actual Discharge*		Allowed Discharge Rate Per Ch. 17-2, F.A.C.**	Allowable Discharge*** (lbs./hr.)	Relate to Flow Diagram
	lbs./hr.	T/yr.			
Particulate	3.3*	14.4*	Process Wy-Table	28	
Note:	Actual discharge		will not exceed 3.3 lb/hr		

* Includes a 50 percent safety factor above minimum actual emissions.

D. Control Devices:

Name and Type (Model and Serial No.)	Contaminant	Efficiency†	Range of Particles Size Collected (in microns)	Basis for Efficiency††
Mikro-Pul Corp	Particulate	99.9	< 1	Design Data
Mikro Pulsaire				
#55-8-FV				

*Estimate only if this is an application to construct.

**Specify units in accordance with emission standards prescribed within Section 17-2.04, F.A.C. (e.g. Section 17-2.04(6)(e)1.a. specifies that new fossil fuel steam generators are allowed to emit particulate matter at a rate of 0.1 lbs. per million BTU heat input computed as a maximum 2-hour average.)

***Using above example for a source with 260 million BTU per hour heat input: $\frac{0.1 \text{ lbs}}{\text{MMBTU}} \times \frac{260 \text{ MMBTU}}{\text{hr.}} = 26$ lbs./hr.

†See Supplemental Requirements, page 5, number 2.

††Indicate whether the efficiency value is based upon performance testing of the device or design data.

E. Fuels:

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

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

Fuel Analysis:

Percent Sulfur: _____ Percent Ash: _____

Density: _____ lb./gal.

Heat Capacity: _____ BTU/lb. _____ BTU/gal.

Other Fuel Contaminants: _____

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:

_____

_____

_____

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

Stack Height: 8 ft. Stack Diameter: 10 inches ft.

Gas Flow Rate: 1887 ACFM Gas Exit Temperature: 200 °F

Water Vapor Content: 0 %

SECTION IV: INCINERATOR INFORMATION

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.)
Lbs./Hr. Incinerated							

Description of Waste: _____

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

Approximate Number of Hours of Operation per Day: _____ , days/week: _____

Manufacturer: _____

Date Constructed: _____ Model No.: _____

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

Stack Height: _____ ft. Stack Diameter: _____ Stack Temp.: _____ °F

Gas Flow Rate: _____ ACFM _____ DSCFM*

*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 Device:

Ultimate Disposal of Any Effluent Other Than That Emitted From the Stack (scrubber water, ash, etc.): _____

SECTION V: SUPPLEMENTAL REQUIREMENTS

Please Provide the Following Supplements Required For All Pollution Sources:

1. Total process input rate and product weight - show derivation. See Attachment B
2. Efficiency estimation of control device(s) - show derivation. Include pertinent test and/or design data. See Attached Literature
3. An 8½" 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. See Drawing CR-L2-A-4
4. An 8½" x 11" plot plan of facility showing the exact location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram. See Drawing CR-CC-G9-A-2
5. An 8½" x 11" plot plan showing the exact 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 USGS topographic map.) See Drawing CR-L3-A-0
6. Description and sketch of storm water control measures taken both during and after construction.
7. An application fee of $20.00, unless exempted by Chapter 17-4.05(3), FAC, made payable to the Department of Environmental Regulation.
8. With construction permit application, include design details for control device(s). Example: for baghouse, include cloth to air ratio; for scrubber, include cross-sectional sketch; etc. See Attached Literature
9. Certification by the P.E. with the operation permit application that the source was constructed as shown in the construction permit application.

EXHIBIT A

CRYSTAL RIVER UNIT 2
FLY ASH HANDLING SYSTEM
PRECIPITATOR MODIFICATION

Subsequent to the Unit 2 coal conversion, the air quality control requirements for the Crystal River site resulted in the need for designing to a lower than originally anticipated sulphur content in the future coal supply for Crystal River Unit 2. This requirement combined with inadequacy of the initial precipitator modification to achieve compliance with federal emission regulations resulted in the need to upgrade the Unit 2 precipitator capability. Consequently, the existing electrostatic precipitator will be modified by adding 13 new fields, and a new precipitator will be added. The total Unit 2 gas flow will be divided between the modified and the new precipitator.

Currently, the fly ash is evacuated from the existing Unit 2 precipitator and economizer hoppers by means of a dry vacuum produced by the dual jet hydroevactors using high pressure sea water. Along with the precipitator modification and addition, the existing Unit 2 dry fly ash system will be changed such that the vacuum required to draw ash from the precipitator (2A, 2B & 2C) will be produced by vacuum blowers (as currently on Unit 1) and not by the hydroveyors. The hydroveyors will be left to serve as a back-up. The two new bag filters are identical, and are similar to that on Unit 1. Listed below is the technical information and specifications applicable to each of the two new bag filters:

Source 4 & 5

Efficiency - 99.9+%

Cost - $21,000

Supplier - United Conveyor Corporation

Manufacturer - Mikro-Pul Corporation

Name - Mikro-Pulsaire

Model - #55-8-FV

Blower exhaust diameter - 10 inches

Blower exhaust height - 8 feet

Air to cloth ration - 3.64 ACFM/ft.^{2}

Air flow rate - 1887 ACFM

Area of filtering media - 518 ft.^{2}

Velocity - 3186 ft/min.

Process weight - 27.5 tons ash per hour

Actual discharge - 2.2 lbs. per hour or 9.6 tons per year

EXHIBIT B

CALCULATION SHEET

ASH HANDLING SYSTEM AIRBORNE CONTAMINANTS

CRYSTAL RIVER UNIT 2 PRECIPITATOR MODIFICATION

Source 4: Precipitator 2C Conveying Line Bag Filter

27.5 tons per hour (max design) of ash is drawn from Unit 2 precipitator through the separator where 96% of the ash is removed and flows into the transfer silo. The remaining ash and air enter the bag filter where 99.9% of the ash is removed with the air exhausted through the vacuum blower. Actual discharge estimate based on 96% efficient separators and 99.9% efficient bag filter.

Process Weight

Design fly ash rate from Unit 2 precipitator	27.5 tons per hour

Actual Discharge

27.5 TPH x 0.04 x 0.001	2.2 lbs. per hour 9.6 tons per year

Source 5: Precipitator 2A & 2B Conveying Line Bag Filter

27.5 tons per hour (max design) of ash is drawn from Unit 2 precipitator 2A & 2B through the separator where 96% of the ash is removed and flows into the transfer silo. The remaining ash and air enter the bag filter where 99.9% of the ash is removed with the air exhausted through the vacuum blower. Actual discharge estimate based on 96% efficient separators and 99.9% efficient bag filter.

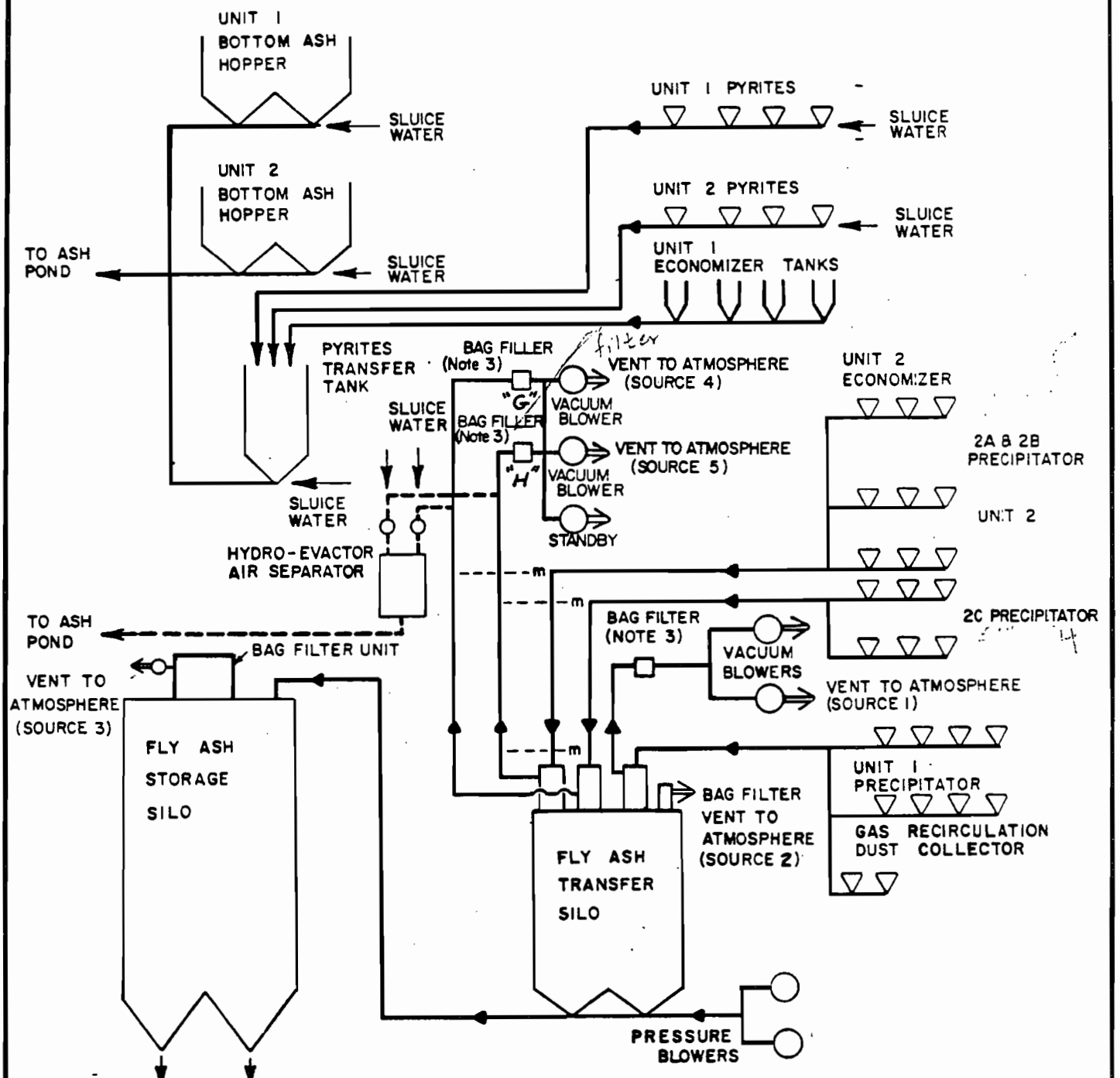
Process Weight

Design fly ash rate from Unit 2 precipitator	27.5 tons per hour

Actual Discharge

27.5 TPH x 0.04 x 0.001	2.2 lbs. per hour 9.6 tons per year

FLORIDA POWER CORPORATION
SYSTEM ENGINEERING DEPARTMENT



NOTE:

1. DOTTED LINE INDICATES EMERGENCY FLY ASH DISPOSAL.
2. DOUBLE LINES INDICATES VENTED CONVEYING AIR
3. BAG FILTER DISCHARGES ASH TO TRANSFER SILO DISCHARGE

REVISIONS		
NO.	DATE	
1	2-28-78	ADDED VENTS
2	5-9-78	RELOCATE VENTS
3	6-20-78	ADDED DETAILS
4	2-20-78	2C PRECIPITATOR SYST'M.

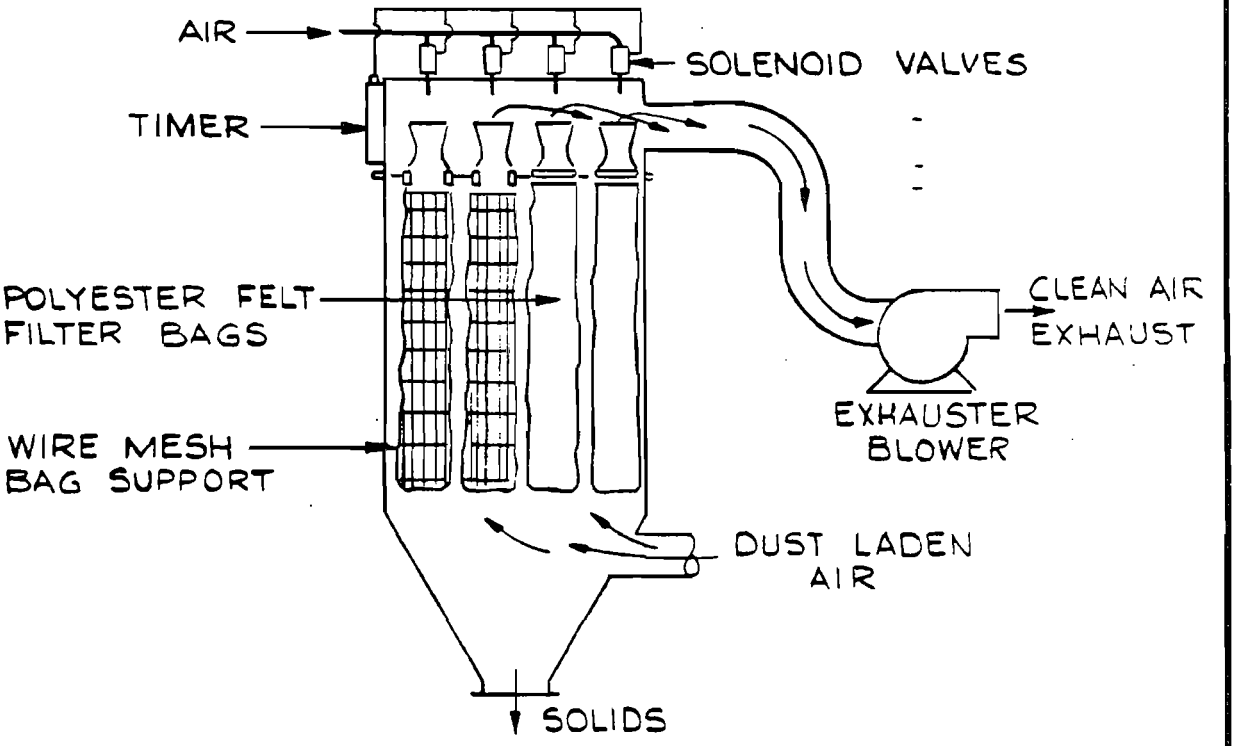
CRYSTAL RIVER UNITS 1 & 2

ASH HANDLING SYSTEM
COAL CONVERSION

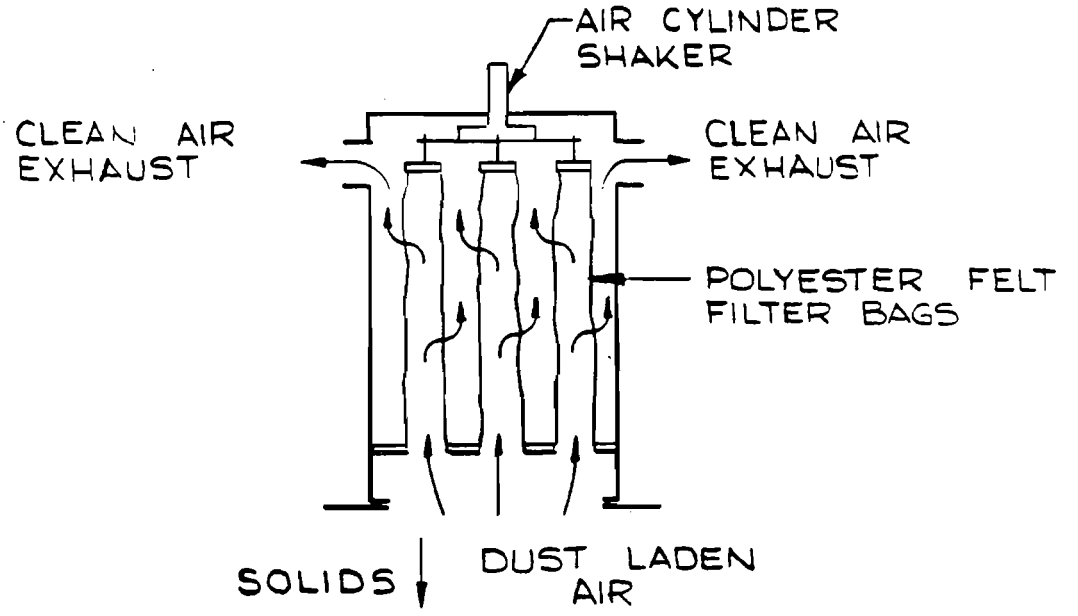
DRAWN BY	Vbeau.
DATE	10-6-77
CHECKED	
APPROVED	
SCALE	Not Shown

DWG. NO. CR-L2-A-4

FLORIDA POWER CORPORATION
SYSTEM ENGINEERING DEPARTMENT



SOURCE 1 & 3,4 & 5



SOURCE 2

REVISIONS		
NO.	DATE	

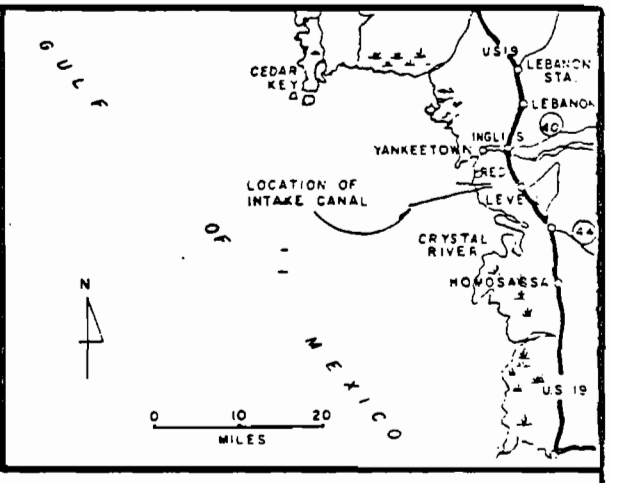
CR-CC Fly Ash Handling System Bag Filter Unit Schematic

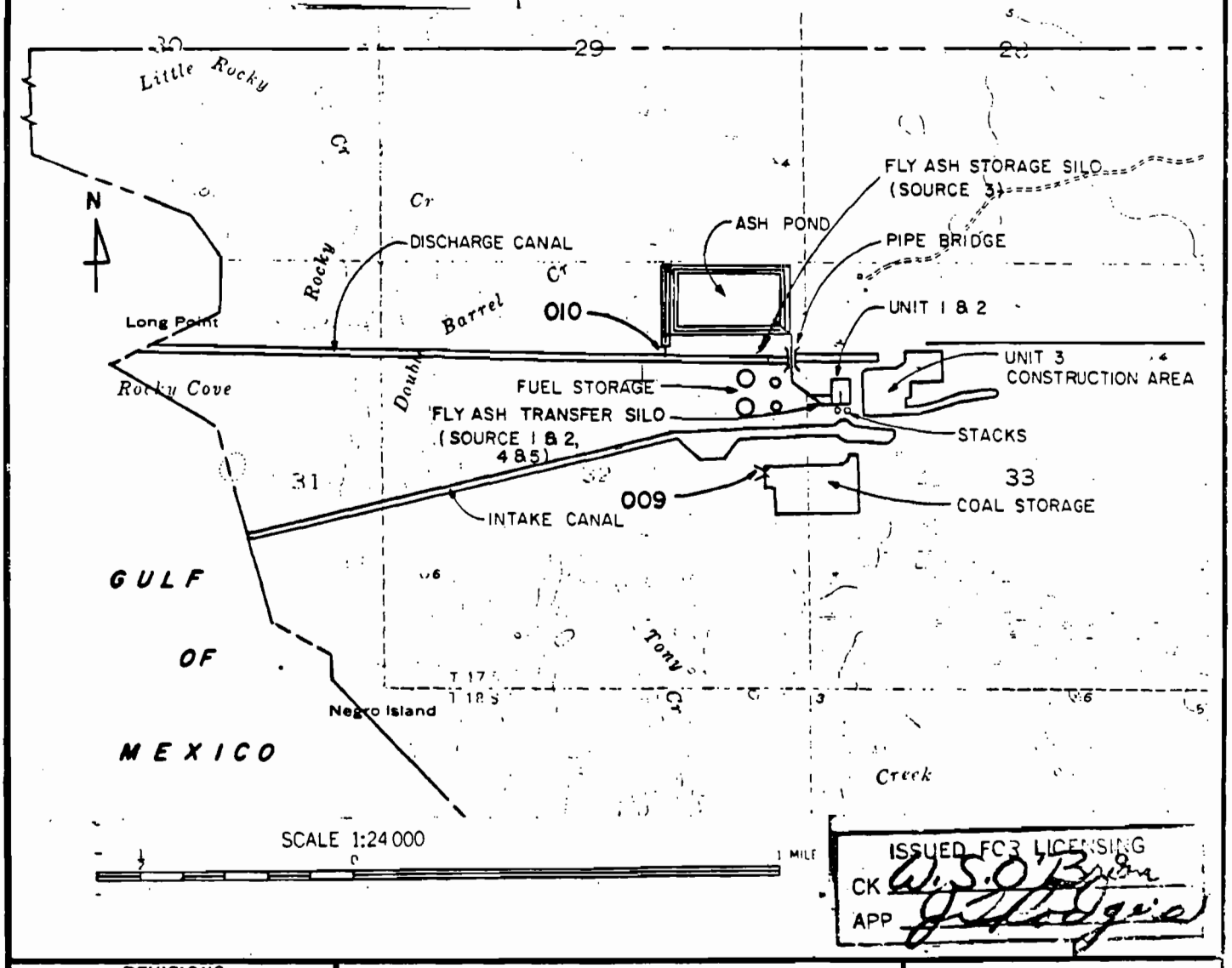
DRAWN BY	RJBetts
DATE	6/22/78
CHECKED	
APPROVED	
SCALE	NONE

DWG. NO. CR1&2-L4-A-0

K&E 17 0183 9-78 MC4064

FLORIDA POWER CORPORATION
SYSTEM ENGINEERING DEPARTMENT





ISSUED FOR LICENSING
CK W.S.O'Brien
APP J.H.Griffis

REVISIONS		
NO.	DATE	
1	2/28/78	ADDED FLY ASH SILO & ASH
2	3/9/79	ADDED SOURCE 4 & 5

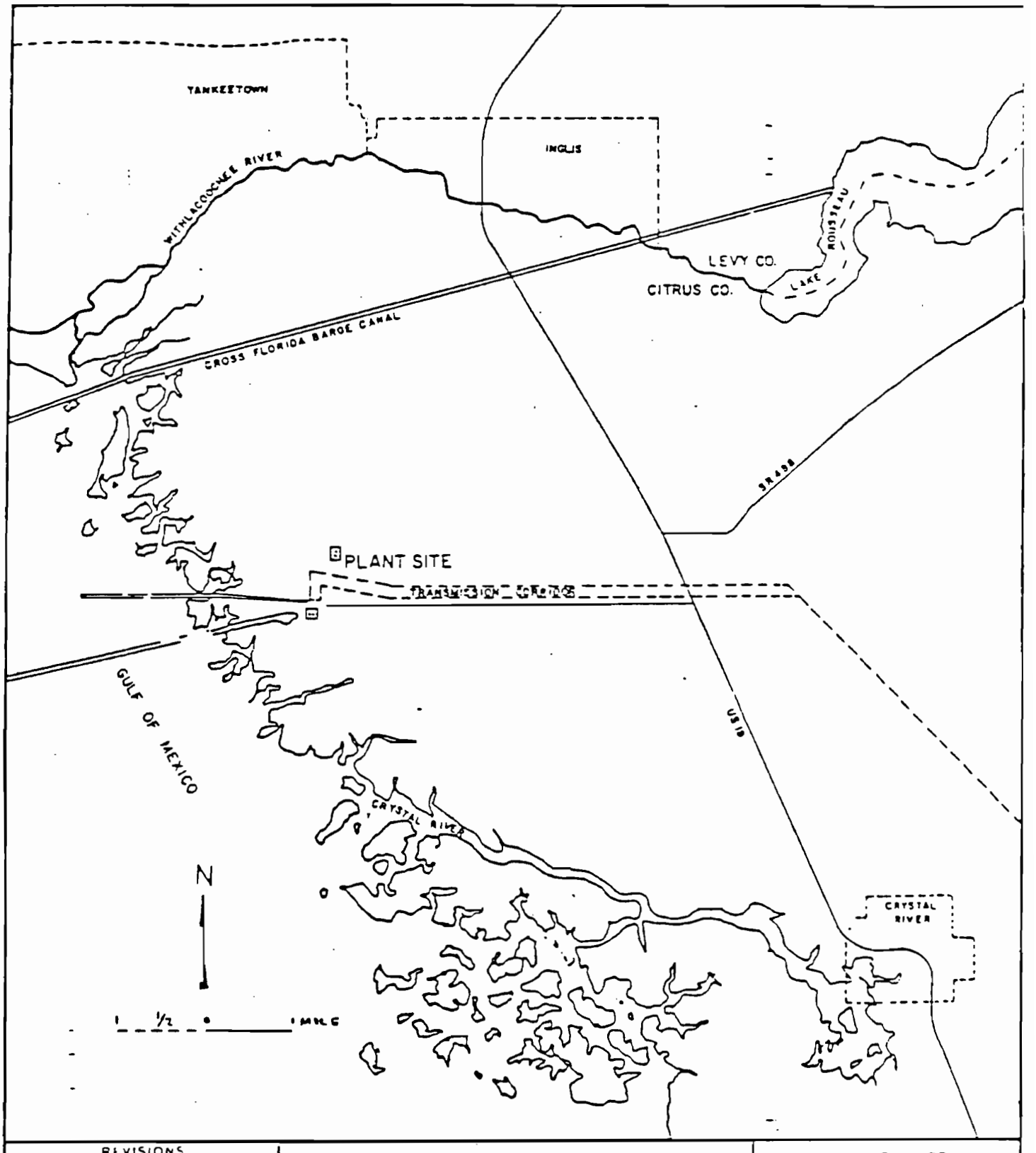
KEY PLAN
WASTEWATER DISPOSAL

DRAWN BY	DRH
DATE	3-16-76
CHECKED	
APPROVED	
SCALE	

DWG. NO. CR-CC-G9-A-2

FLORIDA POWER CORPORATION

SYSTEM ENGINEERING DEPARTMENT

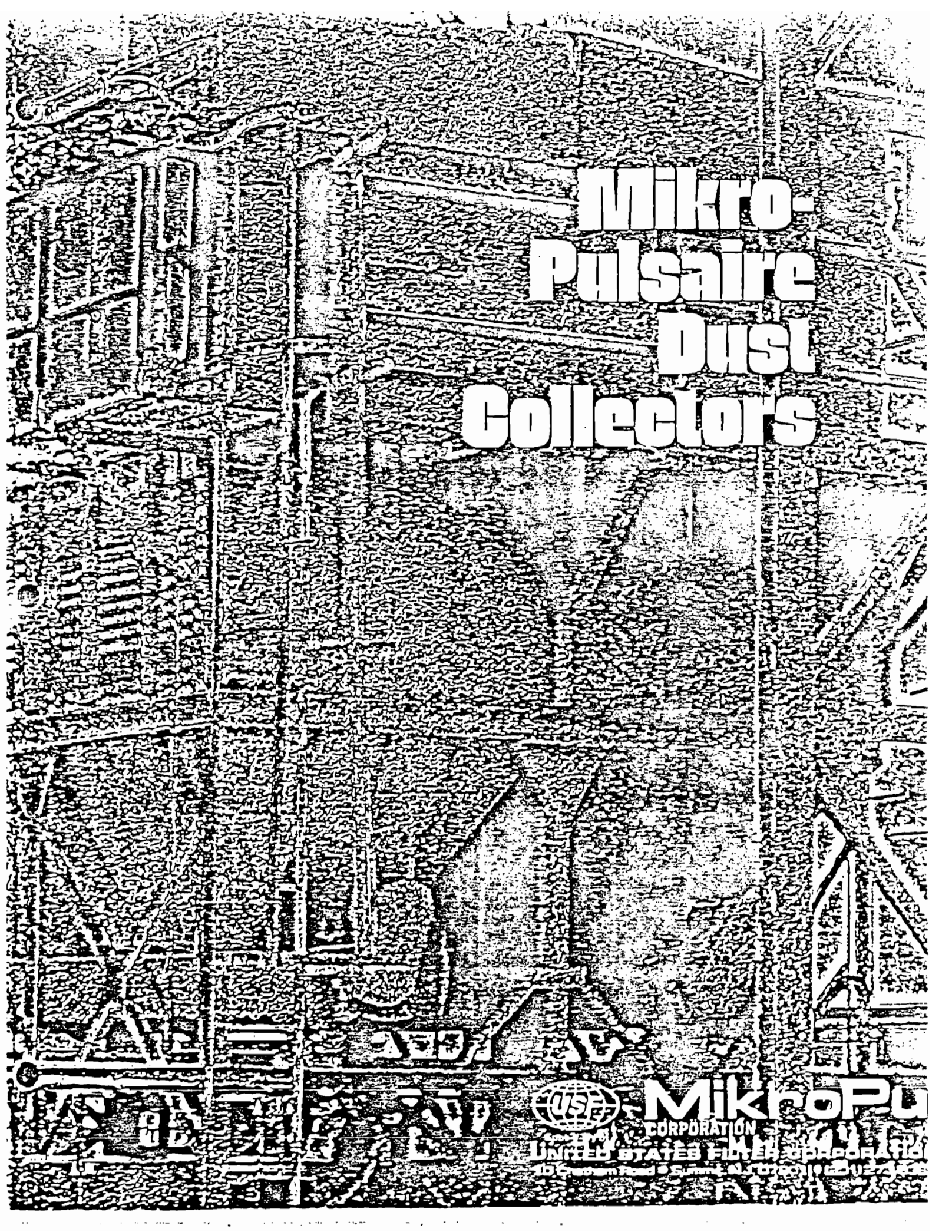


REVISIONS		
NO	DATE	

GENERAL AREA LOCATION MAP

DRAWN BY	S MIKER
DATE	6-14-78
CHECKED	
APPROVED	
SCALE	

DWG. NO CR-L3-A-0


Mikro-
Pulsaire
Dust
Collectors
MikroPu
CORPORATION

For Maximum Dust Recovery

Mikro-Pulsaire

The Mikro-Pulsaire dry filter collector combines high dust collection efficiency with very low maintenance. The unit is fully automatic and self cleaning. The unique design of the Mikro-Pulsaire has eliminated all moving parts thereby contributing to minimum maintenance and maximum efficiency of operation. All controls for the Mikro-Pulsaire are located on the outside of the unit.

Reverse Jet Operation

Basically the Mikro-Pulsaire consists of a series of cylindrical filter elements enclosed in a rugged, dust-tight fabricated metal housing. The contaminated, dust-laden air enters the housing through the hopper inlet. The dust particles accumulate on the filter elements. Periodically a momentary jet of high-pressure air is "pulsed" through a uniquely designed venturi nozzle located above each filter cylinder. The primary high-pressure jet pumps secondary air as a function of the jet pump method thereby producing a "reverse-flow" of air which cleans the filter cylinders. Continuous flow of air through the Mikro-Pulsaire is maintained at all times since only a small part of the filter element is cleaned at any given time. The air jets are controlled by diaphragm valves which are activated by solenoid pilot valves and a timer.

Unique Features

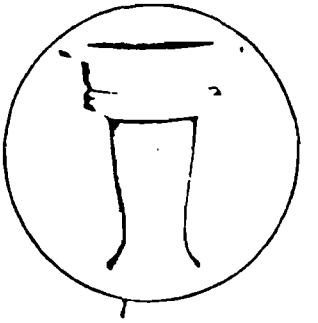
- High Dust Collection Efficiency . . . 99.9%
- Heavy Duty Construction . . . Minimum 14 Gauge
- No Internal Moving Parts
- Economical Installation . . . All Units Pre-wired
- Handles Dust Streams to 425° Fahrenheit. High temperature filter elements of DuPont "Nomex"* allows operation above most acid dew points. When extra resistance to chemicals is required DuPont Teflon* is also available for use in the filter elements.
- Installations World Wide . . . Over 60,000 installations throughout the world.
- Can be Used by Any Industry Having a Dry Dust Problem.

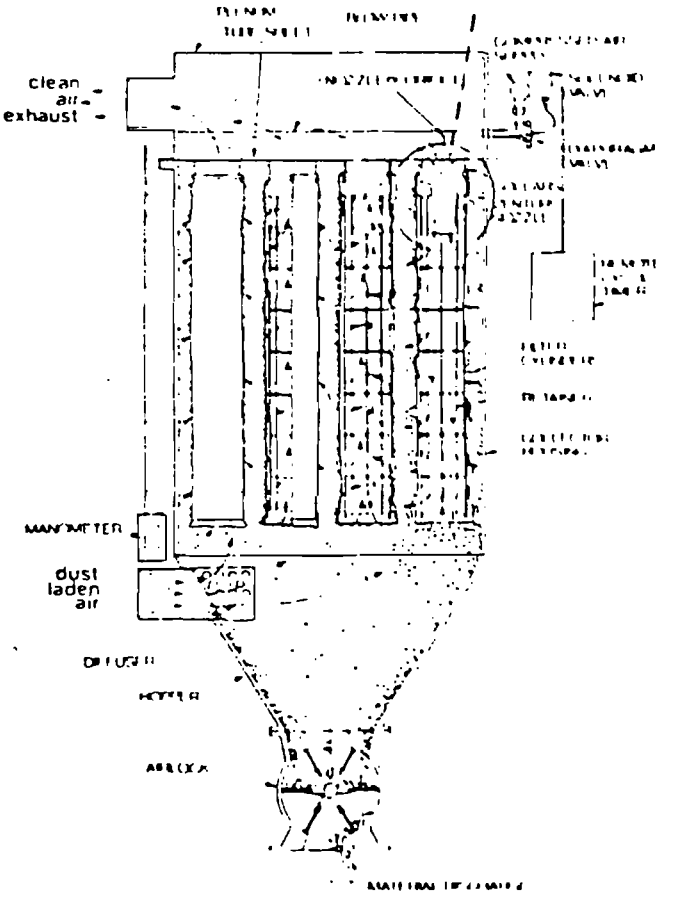
AVAILABILITY — All Mikro-Pulsaires can be supplied in three styles:

A Style — Plenum only
B Style — Plenum and Housing
C Style — Plenum, Housing and Hopper

Original MikroPul Venturi

This venturi provides maximum efficiency to the filter media and is standard equipment of all Mikro-Pulsaire dust collectors.

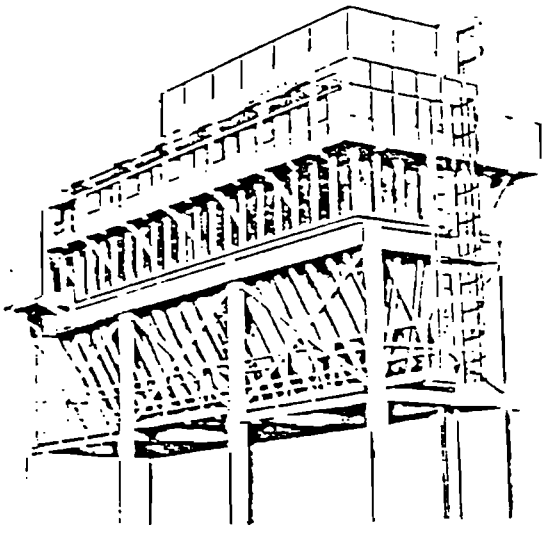




Schematic diagram showing the flow of dust and air and the arrangement of filter cylinders in the Mikro Pulsaire Dust Collector.

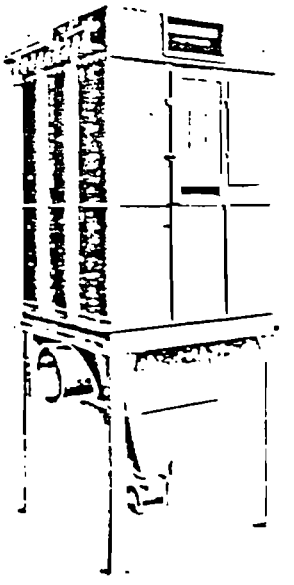
Mikro Pulsaire is originated and manufactured solely by MicroPul Corporation.

YOUR DUST CONTROL PROBLEM



Modular Mikro-Pulsaire

Field-erected. Designed for the big jobs. Modular sections are readily combined for unlimited filtering capacity.

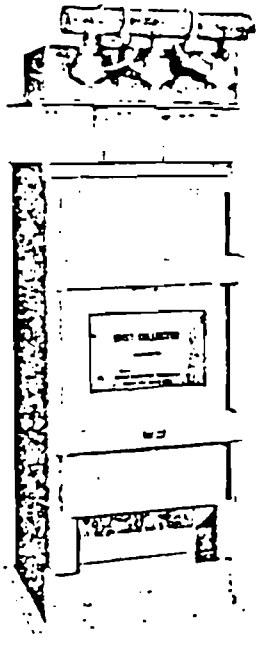


Pre-Assembled Mikro-Pulsaire

Factory-assembled. Wide range of sizes from 16 to 144 filter bags. Bags are 8 and 10 ft. long.

Cylindrical Mikro-Pulsaire

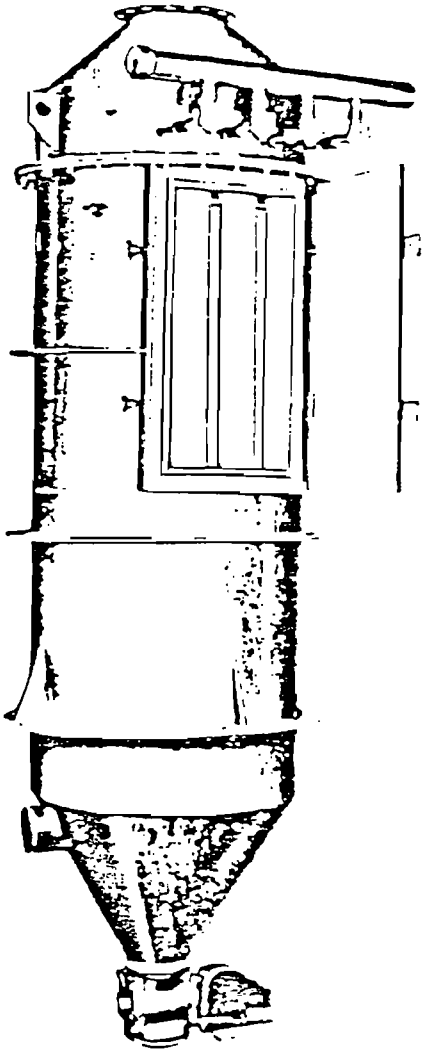
Compact, rugged round housing. Ratings standards — up to 100" H_2O and up to 220° H_2O.



Bin-Vent Unit Mikro-Pulsaire

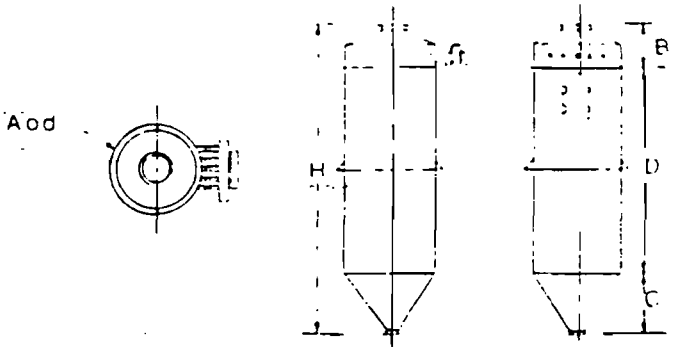
Mounts directly on receiver bins. Available with 25, 42, 63 and 84 sq. ft. of filter surface.

Cylindrical Mikro-Pulsaire



Cylindrical Housing Designed For A Wide Range Of Processing Applications

The Cylindrical Mikro-Pulsaire is factory assembled. It is fabricated of heavy duty 12 gauge steel. Available in sizes ranging from 12 to 109 filter bags. Bags are 8 and 10 feet long. This unit offers optimum space saving efficiency with maximum cloth area per square foot of floor space. The Cylindrical Mikro-Pulsaire is being successfully used in a broad field of industrial processes including spray drying, separating, mixing, carloading and many other processes requiring the recovery of materials or the control of dust problems.



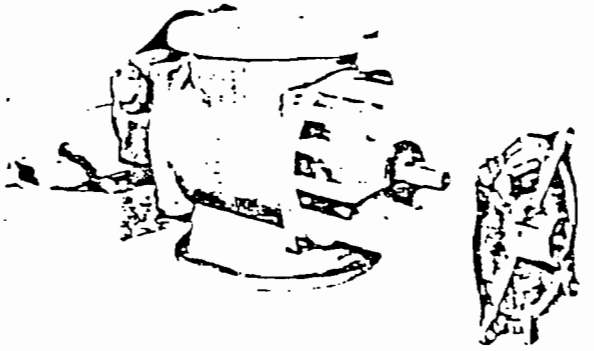
Specifications

Cylindrical Series

8 Ft. and 10 Ft. Filter Tubes

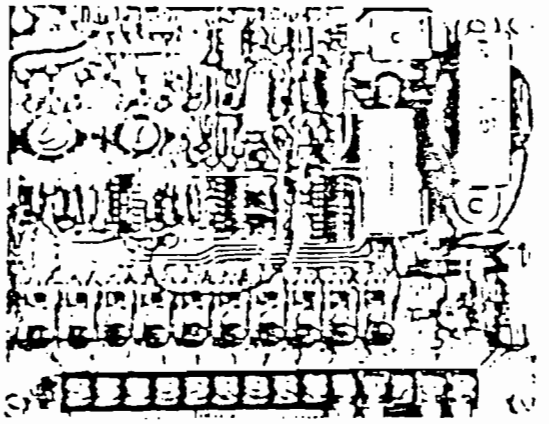
Model	12		19		23		31		42		55		69		85		97		109	
	-8-160	-10-160	-8-130	-10-130	-8-105	-10-105	-8-70	-10-70	-8-55	-10-55	-8-40	-10-40	-8-30	-10-30	-8-30	-10-30	-8-20	-10-20	-8-20	-10-20
Number of Filter Tubes	12	12	19	19	23	23	31	31	42	42	55	55	69	69	85	85	97	97	109	109
Filter Area Ft.	113	141	178	224	216	271	292	365	395	495	518	648	649	812	800	1001	914	1142	1026	1283
Approx. Wt. in lbs.	850	930	960	1075	1175	1300	1300	1450	1675	1800	1950	2150	2500	2725	2700	3000	3375	3650	3375	3650
Dim. A inches	30	30	36	36	42	42	48	48	54	54	60	60	72	72	72	72	84	84	84	84
Dim. C inches	19½	19½	24½	24½	31½	31½	36½	36½	40½	40½	48½	48½	56½	56½	56½	56½	68½	68½	68½	68½
Dim. B inches	16½	16½	17½	17½	18½	18½	19½	19½	20½	20½	21½	21½	24½	24½	23½	23½	26½	26½	25½	25½
Dim. D inches	108	132	108	132	108	132	108	132	108	132	108	132	108	132	108	132	108	132	108	132
Dim. H inches	138½	162½	150½	174½	157½	181½	162½	186½	169½	193½	175½	199½	188½	212½	187½	211½	200½	224½	200½	224½

Mikro-Pulsaire Accessories



Mikro-Airlock

The Mikro-Airlock is a precision-built rotary valve for continuous discharge from dust collectors, cyclones, pulverizers, blenders, mixers, screw conveyors, and storage bins. It is ideal for feeding pulverizers, pneumatic conveying systems, mixers, and blenders. The Mikro-Airlock is available in 8" and 14" sizes, for both high and low pressure applications. Metal, rubber and plastic rotor vanes are available.



Model 72 Integrated Cyclic Timer

The Model 72 Integrated Cyclic Timer is an all solid state sequential type, capable of switching 10 independent outputs. Each output has a switching capacity of one amp at 115 V. It is mounted on a glass reinforced circuit board. All timers are completely wired for ten outputs as received.

It is reliable for millions of cycles of operation and eliminates mechanical or electrical problems common to mechanical timers or relays.

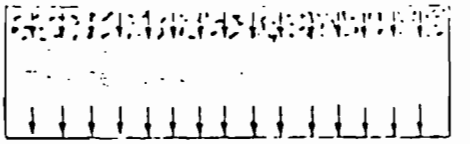
HCE Treated Felt Filter Media

MikroPul pioneered the use of advanced, more efficient filter media to meet the increasingly higher temperature requirements. A patented HCE treatment further adds to the dust collection efficiency of all filters used in the Mikro-Pulsaire.

Cost, efficiency, physical conditions — such as temperature and humidity — and chemical compatibility with both solid and gas streams should be considered in selecting the proper filter medium.

The following filter materials are available for use in the Mikro-Pulsaire:

1. Wool Felt, for temperatures to 180 F
2. Polypropylene, for temperatures to 200 F
3. Acrylic, for temperatures to 240 F
4. Polyester, for temperatures to 275 F
5. Nomex Felt, which will handle effluents to 425 F
6. Teflon filter bags can be supplied for special chemical applications.

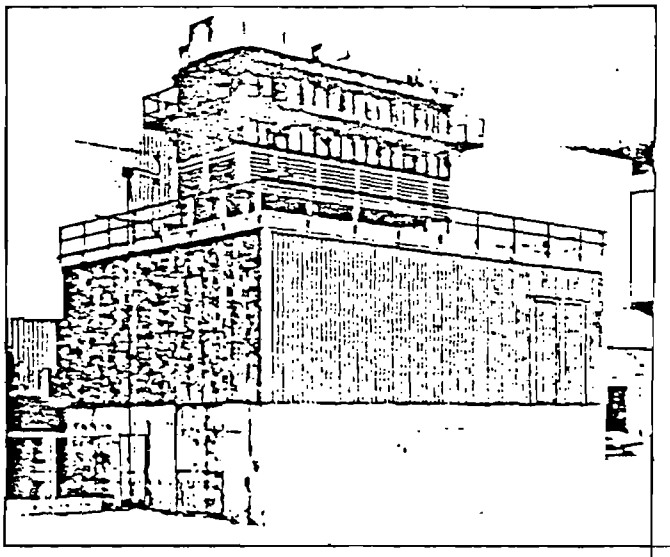


Felt Media
Dense felt that excludes submicron particles will filter air at a far higher rate than woven cloth when high pressure cleaning jets are used. Drawing above illustrates heavily matted texture of felt that traps particles while a uniform volume of air flows through.

"NOMEX" For High Temperatures to 425 F

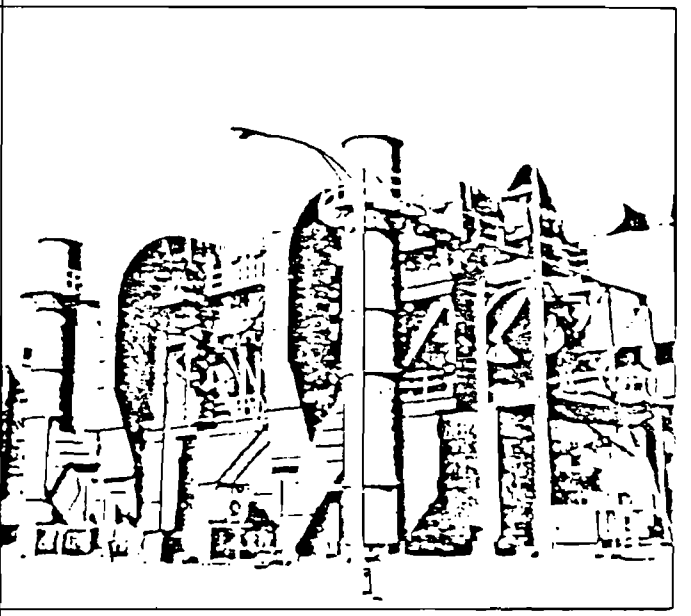
Nomex is a continuous filament yarn specially developed by DuPont to meet the need for an industrial fiber with good heat-resistant characteristics. MikroPul offers this outstanding material in felted filter bags — and unlike fragile glass cloth elements, it can be twisted, folded, or pulled in any direction — shipped, handled and installed with only normal care . . . all without damage.

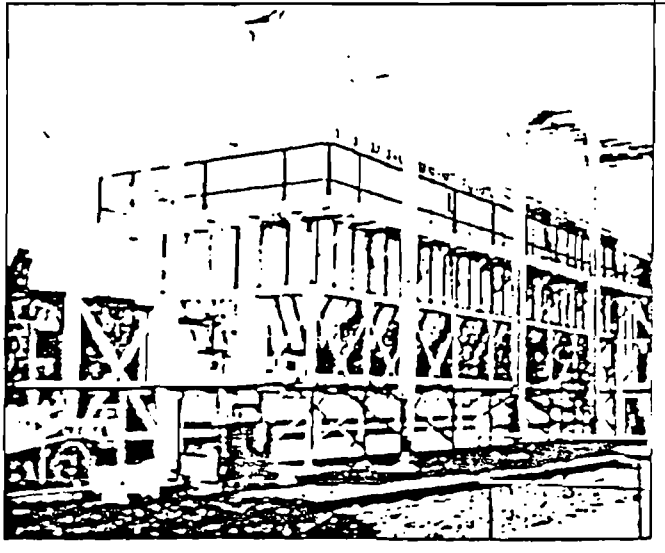
More Efficiently And Economically



◊Atmospheric Air Cleaning

Cement◊ Industry

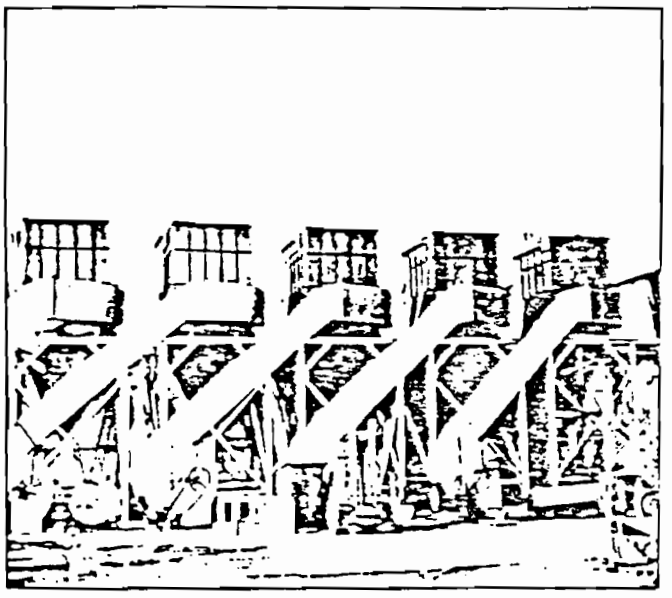




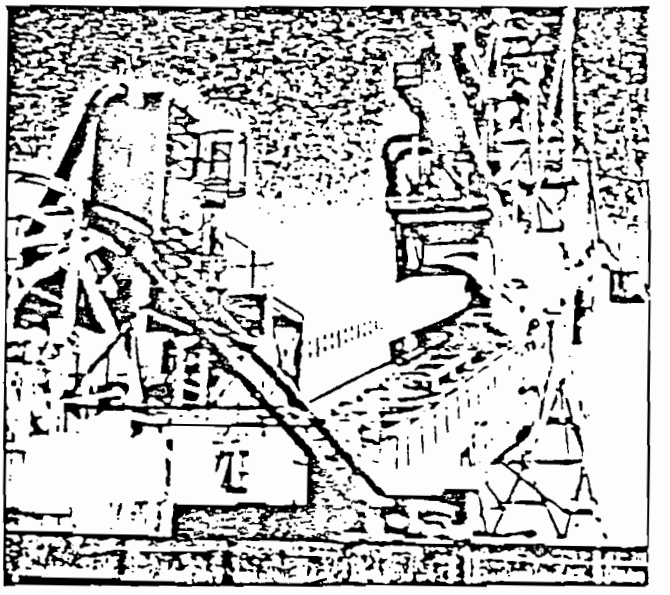
◊Materials Handling

A Variety of Fields

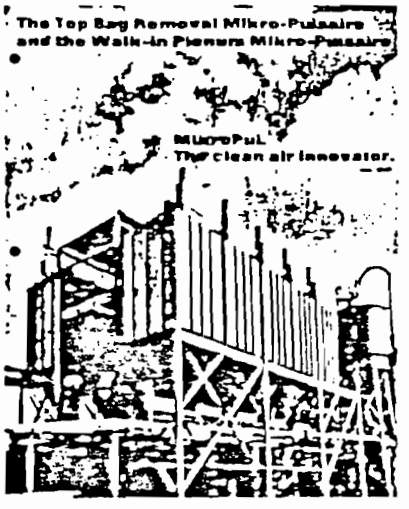
Woodworking Industry



Nuisance Venting



Other Mikro-Pulsaires Are Available...



The Top Bag Removal and Walk-In Plenum Units along with the series "W" Filter Collectors are also available from MikroPul. For detailed information covering these units write for catalogs TRP-1 and CPW-1.

Florida Power
CORPORATION

October 16, 1978

TO WHOM IT MAY CONCERN

Subject: Letter of Authorization

Please be advised that Mr. W. S. O'Brien, Director, Environmental & Licensing Affairs, is authorized to represent Florida Power Corporation in matters relating to necessary permits required from regulatory authority in the areas of air, water and power plant site certification.

Very truly yours,

Ned B. Spake

Ned B. Spake
Vice President

NBS/db

State of Florida

DEPARTMENT OF STATE • DIVISION OF CORPORATIONS

I certify from the records of this office that FLORIDA POWER CORPORATION, is a corporation organized under the laws of the State of Florida.

The charter number for this corporation is 142619.

I further certify that said corporation has filed all annual reports and paid all annual report filing fees due this office through December 31, 1978, and its status is active.

GIVEN under my hand and the Great Seal of the State of Florida, at Tallahassee, the Capital, this the 4th day of December, 1978.

SECRETARY OF STATE

CR 101
7-21-78

State of Florida

DEPARTMENT OF ENVIRONMENTAL REGULATION

INTEROFFICE MEMORANDUM

For Routing To District Offices And/Or To Other Than The Addressee

To: _____ Loctn.: _____

To: _____ Loctn.: _____

To: _____ Loctn.: _____

From: _____ Date: _____

TO: Victoria J. Tschinkel

FROM: Victoria Martinez Victoria Martinez

DATE: January 26, 1979

SUBJECT: BACT Determination, Florida Power Corporation Units 1 and 2 Fly Ash Handling System, Crystal River Plant, Citrus County

Facility: A fly ash handling system modifying the existing hydraulic system such that the fly ash generated by coal fired operation of Units #1 and #2 can be conveyed in a dry state to a storage silo providing for truck disposal. Currently, ash from unit #2 is hydraulically sluiced to an ash holding pond. The modification to handle fly ash as a dry material will include unit #1, to be converted from oil to coal in March, 1979. Fly ash particulate emission from the facilities are controlled by the following:

Source 1: Bag filter for unit 1 conveying line
Source 2: Bag filter for transfer silo vent
Source 3: Bag filter for storage silo vent

BACT Determination Requested by the Applicant:

Particulate*	lbs/hr.	tons/yr.**
Source 1	3.52	15.4
Source 2	0.03	0.13
Source 3	0.59	2.58

*Emission levels to be attained with 99.9+% efficient bag dust collectors

**Based on 100% continuous load

Date of Receipt of a Complete BACT Application:

November 16, 1978

Date of Publication in the Florida Administrative Weekly:

December 1, 1978

Date of Publication in a Newspaper of General Circulation:

May 5, 1978

Study Group Members:

Frank Darabi, DER St. Johns River Subdistrict, Gainesville;
Mike Harley, DER Bureau of Air Quality Management, Tallahassee;
George Layman, Gulf Power Company, Pensacola;
Dave Puchaty/
William Brown, DER Southwest District, Tampa

Study Group Recommendations:

	Particulate			Opacity
	Source 1	Source 2	Source 3	
Frank Darabi	Baghouse with 99.9+% efficiency/filter velocities should be checked when permit is issued to insure it is within acceptable limits; alarm system for bag blinding or bag tearing should be considered			N.R.*
Mike Harley	3.52 lbs/hr baghouse	0.03 lbs/hr baghouse	0.59 lbs/hr baghouse	N.R.*
George Layman	Baghouse is "State of the Art"			N.R.*
William Brown	3.52 lbs/hr baghouse	0.03 lbs/hr baghouse	0.59 lbs/hr baghouse	5%

*N.R. No response

BACT Determination by Florida Department of Environmental Regulation:

Particulate	lbs/hr.	
Source 1	3.52	Attainable with 99.9+% efficient bag dust collector
Source 2	0.03	Attainable with 99.9+% efficient bag dust collector
Source 3	0.59	Attainable with 99.9+% efficient bag dust collector
Opacity	Less than 5%	

Test Method: EPA's methods 1 - 5 as described in the August 17, 1977 Federal Register

Justification of DER Determination:

The low emission limitation determined as BACT for this fly ash handling system represents 99.9+% efficiency of control with the applicant's proposed bag dust collector. The reliability of the bag dust collector is well established and its efficiency is not surpassed by any other particulate pollution control device for the service proposed.

Details of Analysis May be Obtained by Contacting:

Victoria Martinez, BACT Coordinator
Department of Environmental Regulation
2600 Blair Stone Road
Twin Towers Office Building
Tallahassee, Florida 32301

Recommendation from: Bureau of Air Quality Management

by: JPSubramani
J. P. Subramani

Date: JANUARY 30, 1979

Approved by: Victoria J. Tschinkel
Victoria J. Tschinkel

Date: February 5, 1979

VJT:es

Attachment

ATTACHMENT A

COMPLETE BACT APPLICATION

D.E.R.
NOV 16 1978
Complete SOUTHWEST DISTRICT
TAMPA

D.E.R.
OCT 20 1978
SOUTHWEST DISTRICT
TAMPA

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

APPLICATION FOR DETERMINATION OF BEST AVAILABLE CONTROL TECHNOLOGY FOR AIR POLLUTION SOURCES

SOURCE STATUS: (X) New ( ) Modification

Company Name: FLORIDA POWER CORPORATION County: Citrus

Source Identification: Crystal River Units 1 & 2 Fly Ash Handling System

Source Location: Street: Crystal River Plant Site City:

UTM: East See Below North See Below

Appl. Name and Title: N. B. Spake, Vice President

Appl. Address: P. O. Box 14042, St. Petersburg, FL 33733

Appl. Phone: 813/866-4763

DEPARTMENT USE ONLY

Date Appl. Received:

Notice of Receipt:

Newspaper: Date:

Florida Administrative Weekly Date:

BACT Determination:

Declared by Secretary: Date:

BACT:

NOTICE OF DETERMINATION

Newspaper: Date:

Florida Administrative Weekly Date:

UTM; East	S1	334218.347	North	S1 3204245.701
	S2	334216.058		S2 3204246.626
	S3	334222.003		S3 3204499.985

DER Form 17-1.122(16) (Mar 78) Page Two of Two

I. DETAILED DESCRIPTION OF SOURCE

A. Describe the manufacturing process at the facility and the unit operation to be controlled. Discuss the source of emissions, existing control devices, the expected improvement in performance, and state whether the project will result in compliance with ambient air quality standards or applicable PSD increments. Attach additional sheet if necessary.

See attached Exhibit A and Dwg. No. CR-L2-A-2

B. For this source indicate any previous DER permits, orders, and notices; including issuance dates and expiration dates.

--

C. Raw materials, fuels, and chemicals used:

DESCRIPTION	HOURLY USE	CONTAMINANTS		RELATION
		TYPE	% WT.	TO FLOW DIAGRAM

D. Process Rate

1. Total Process Input Rate:

Source 1 .... 44 TPH Fly Ash
Source 2 .... 99.04 TPH Fly Ash
Source 3 .... 100 TPH Fly Ash

2. Product Output Rate:

Source 1 .... 44 TPH Fly Ash
Source 2 .... 95.04 TPH Fly Ash
Source 3 .... 100 TPH Fly Ash

3. Operating Time:

a. Hrs./Day: b. Days/Wk: c. Wks./Yr.: d. Seasons:

II. BEST AVAILABLE CONTROL TECHNOLOGY DATA

A. Emission limitations for any pollutants emitted from the source pursuant to 17-2 F.A.C.?

Yes ( ) No ( )

CONTAMINANT	RATE OR CONCENTRATION	FOR CLASS II AREA MAXIMUM ALLOWABLE INCREASE IN CONCENTRATIONS
Particulate	Annual geometric mean: 19 ug/m^3	24 hr max 37 ug/m^3
SO_X as SO_2	Annual arithmetric mean: 20 ug/m^3 24 hr max: 91 ug/m^3	3 hr max: 512 ug/m^3
NO_X as NO_2	----------	
HC as (H_4)	----------	
CO	----------	

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

Yes ( ) No (X)

CONTAMINANT	RATE OR CONCENTRATION
Particulate	*Not Applicable
SOX as SO_2	* 150 ppm by volume
NOX as NO_2	* 75 ppm by volume base limitation
HC as (H_4)	*Not Applicable
CO	*Not Applicable

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

Yes ( ) No (X)

CONTAMINANT	RATE OR CONCENTRATION

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

CONTAMINANT	RATE OR CONCENTRATION Lbs/Hr	Tons/Yr**
Fly Ash Particulate, Source 1	3.52	15.4
Fly Ash Particulate, Source 2	.03	.13
Fly Ash Particulate, Source 3	.59	2.58
	** Based on 100% continuous load.	

E. Describe the existing control and treatment technology (If any)

1. Control Device:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:
5. Useful Life:
6. Operating Costs:
7. Energy:
8. Maintenance Cost:
9. Emissions

*Reference is made to page 53783, Selection of Pollutants, Federal Register, Vol. 42, No. 191, Monday, October 3, 1977.

*Explain method of determining E. 3. above.

CONTAMINANT	RATE OR CONCENTRATION	
	Before Device	After Device

10. Stack Parameters

a. Height: Ft.

b. Diameter: Ft.

c. Flow Rate: ACFM

d. Temperature: °F

e. Velocity: FPS

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

1. Data applied to all three dust collectors except as noted.

a. Control Device: Bag Dust Collectors

b. Operating Principles: Polyester felt bag material filters fly ash from the dust laden air entering allowing clean air to excape. Dust collecting on bag surface is agitated by compressed air or vibration and falls below.

c. Efficiency: 99.9+%

d. Capital Cost: Source 1 Dust Collector $20,00(
Source 2 Dust Collector 2,50(
Source 2 Dust Collector 24,00:

e. Life: 20 years

f. Operating Cost: Not currently available

g. *Energy: Nil

h. Maintenance Cost: Not currently available

i. Availability of construction materials and process chemicals: Readily available

j. Applicability to manufacturing processes: Dust collectors are adequately applicable to the system.

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

2.

a. Control Device:

b. Operating Principles:

c. Efficiency:

d. Capital Cost:

e. Life:

f. Operating Cost:

g. Energy:

h. Maintenance Costs:

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:

*Energy to be reported in units of electrical power - KWH design rate.

3.

a. Control Device:

b. Operating Principles:

c. Efficiency:

d. Capital Cost:

e. Life:

f. Operating Cost:

g. Energy:

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:

d. Capital Cost:

e. Life:

f. Operating Cost:

g. Energy:

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:

G. Describe the control technology selected:

1. Control Device: Bag Dust Collectors
2. Efficiency: 99.9+%
3. Capital Cost: Source 1 Dust Collector $20,000
   Source 2 Dust Collector 2,500
   Source 3 Dust Collector 24,000
4. Life: 20 years
5. Operating Cost: Not available
6. Energy: Nil
7. Maintenance Cost: Not available
8. Manufacturer: Source 1 - Mikropulsaire Model 69-8-F-V
   Source 2 - United Conveyor Corp. 7 bag filter vent 3-3201-17
   Source 3 - PulseKing Model M-100S
9. Other locations where employed on similar processes:
   a. Not presently employed at any FPC facility
      (1) Company:
      (2) Mailing Address:
      (3) City:
      (4) State:
      (5) Environmental Manager:
      (6) Telephone No.:
      (7) Emissions:

CONTAMINANT	RATE OR CONCENTRATION

(8) Process Rate:

b.

(1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:

CONTAMINANT	RATE OR CONCENTRATION

(8) Process Rate:

c.

(1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:

CONTAMINANT	RATE OR CONCENTRATION

(8) Process Rate:

d.

(1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:

CONTAMINANT	RATE OR CONCENTRATION

(8) Process Rate:

e.

(1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:

CONTAMINANT	RATE OR CONCENTRATION

(8) Process Rate:

10. Reason for selection and description of systems: Bag dust collectors are the only existing feasible control technology for this service.

11. Emissions:

CONTAMINANT	Lbs/Hr	RATE OR CONCENTRATION	Tons/Yr. *
Fly Ash Particulate, Source 1	3.52		15.4
Fly Ash Particulate, Source 2	.03		.13
Fly Ash Particulate, Source 3	.59		2.58
	* Based on 100% continuous load		

12. Stack Parameters: See Attached Exhibit B

a. Height: Ft.

b. Diameter: Ft.

c. Flow Rate: CFM

d. Temperature: °F

e. Velocity: FPS

13. Fuels:

TYPE	HOURLY USE*		HOURLY HEAT INPUT MILLION BTU/HR.	
	AVG.	MAX.	AVG.	MAX.

TYPE	DENSITY	%S	%N	%ASH

*Gaseous: Cu. Ft./Hr.; Liquid & Solid: Lbs./Hr.

14. Wastes generated, disposal method, cost of disposal: The Fly Ash collected in the storage silo is disposed of by truck either by FPC or a future contractor. Disposal by FPC would cost an estimated $363,000 per year. Cost of disposal by contractor is currently unknown.

H. Discuss the social 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.

See attached Exhibit C - Social Economic Impact
See attached Exhibit D - Environmental Impact

III. ADDITIONAL ATTACHED INFORMATION

A. Show derivation of total process input rate and product weight. See attached Exhibit E

B. Show derivation of efficiency estimation. Dust collector efficiencies are as reported or guaranteed by manufacturer.

C. An 8½" 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 exist, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained. See Dwg. No. CR 1 & 2-L4-A-0

D. An 8½" x 11" plot plan showing the exact location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram. See Dwg. No. CR-CC-G9-A-1

E. An 8½" x 11" plot plan showing the exact location of the establishment, and points of airborne emissions in relation to the surrounding area, residences and other permanent structures and roadways. See Dwg. No. CR-L3-A-0

F. Attach all 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.

PROFESSIONAL ENGINEER REGISTERED IN FLORIDA

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

Signature: _____ Mailing Address: P. O. Box 14042

Name: J. S. Pachul (Please Type) St. Petersburg, Florida 33733

Company Name: Florida Power Corp. Telephone No.: 813-866-5151

Florida Registration Number: 19325 (Affix Seal) Date: October 12, 1978

EXHIBIT A

CRYSTAL RIVER UNITS 1 and 2

FLY ASH HANDLING SYSTEM

COAL CONVERSION - PHASE II

It is intended that a new fly ash handling system be constructed at the Crystal River Plant site. This system will modify the existing system such that the fly ash generated by coal fired operation of Units #1 and #2 can be conveyed in a dry state to a storage silo providing for truck disposal. Currently, fly ash and bottom ash are hydraulically sluiced to an ash holding pond. This existing hydraulic system has been in operation for Unit #2 since the conversion of the unit from oil to coal in December, 1976. The modification to handle fly ash dry will include Unit #1, which is scheduled to be converted from oil to coal in March, 1979. The major components of the new units #1 and #2 fly ash system are outlined as follows:

1. Unit 1 Fly Ash

   Fly ash collecting in the Unit 1 precipitator and gas recirculation dust collector hoppers is evacuated by means of a dry vacuum system produced by one of two vacuum blowers, and discharges at a rate of 44 tons per hour (max design) into a common Unit 1 and 2 transfer silo. The air discharging with the ash into the transfer silo is separated through a primary and secondary separator, then vents through a bag dust collector and exhausts to atmosphere (Source 1) through the vacuum blower. Fly ash collecting in the bag dust collector hopper is discharged to the conveying line at the transfer silo outlet.

2. Unit 2 Fly Ash

   The fly ash will be evacuated from the Unit 2 precipitator and economizer hoppers at a rate of 55 tons per hour (max design) by means of a dry vacuum produced by the existing dual jet hydro-evactors using high pressure sea water. The air discharging with the ash

into the transfer silo is separated through a primary and secondary separator, then is sluiced with sea water into the existing elevated air separator. The sea water then flows by gravity to the ash pond through the existing 12 pipeline with the air vented from the air separator.

3. Units 1 and 2 Transfer Silo

Fly ash collecting in the common transfer silo feeds through two pressurized Nuva-feeders into one of two 8 inch pipelines. The ash in the pipeline is conveyed pressurized at a rate of 50 tons per hour for each pipeline (max design) into the fly ash storage silo located on the north side of the discharge canal by means of one of two pressure blowers. The air in the transfer silo displaced by the incoming ash from Units 2 and 1 vents from the silo to atmosphere through a bag dust collector (Source 2).

4. Units 1 and 2 Storage Silo Facility

The fly ash enters the storage silo through two 8 inch outlet boxes with the conveying air vented through a bag dust collector (Source 3). Disposal from the silo will be by means of an enclosed tanker truck for disposal of ash in a dry state, or by means of an open truck for disposal of wet ash. The wetted ash disposal by truck will utilize an estimated 32,500 gallons of water per day from the currently abandoned wells.

CRYSTAL RIVER UNIT 1 & 2 FLY ASH SYSTEM

BAG DUST COLLECTOR OUTLET PARAMETERS

Source 1

a. Height: Blower exhaust 8 feet above grade
b. Diameter: Blower exhaust 8 inches diameter.
c. Flow Rate: 2550 ACFM.
d. Temperature: 150°F.
e. Velocity: 122 feet per second.

Source 2

a. Height: Collector outlet 35 feet above grade.
b. Diameter: Collector outlet 1 foot equivalent diameter
c. Flow Rate: 268 ACFM.
d. Temperature: 150°F.
e. Velocity: 1.5 feet per second.

Source 3

a. Height: Blower exhaust 93 feet above grade.
b. Diameter: Blower exhaust 1.53 feet equivalent diameter.
c. Flow Rate: 5300 ACFM.
d. Temperature: 150°F.
e. Velocity: 45 feet per second.

EXHIBIT C

CRYSTAL RIVER UNIT 1 & 2 FLY ASH SYSTEM

SOCIAL ECONOMIC IMPACT

The installation of a dry fly ash transfer and storage facilities for Crystal River Units 1 and 2 provides flexibility and potential economy in the disposal of this waste material from the operation of the Crystal River Plants.

Dry fly ash has commercial value as an aggregate in the concrete industry. The market value of this material varies as a function of its demand, but can range from $5.00 to $6.00 per ton (both units are expected to produce an average of 700 tons of dry fly ash per day).

The construction of this dry fly ash transfer and storage facility will employ a construction work force and supervisory staff of approximately 20 people. Capitalized construction cost is estimated at approximately $1.8 million including sales taxes of approximately $35,000. Construction payroll will impact the local community with expected average monthly payroll for the project of $51,500 over the 7 month period. This represents a benefit to employment and the local economy relative to the subsistence needs of these local and transient workers. In addition to labor payroll, construction materials and supplies will be purchased from local businesses. Additional sales taxes will be derived from partial expenditure of this payroll.

The system will become operational in March 1979. The system will create an estimated 4 new permanent jobs to operate, maintain and manage the facility with an estimated new annual payroll of $68,000. In addition, approximately 6 new temporary FPC personnel or future contractor personnel will be required to provide the truck disposal of the ash from the storage silo. These people will be residents of the local area and their income will stimulate the local economy, by the construction of

homes and the consumption of goods and services to meet their living needs. State sales taxes and local property taxes will also be impacted by the presence of these personnel.

Production of a marketable concrete aggregate from this plant will represent a valuable use of an otherwise waste product, and the proceeds from the sale of this ash will result in reducing the overall cost of electric energy produced from the generating plants.

EXHIBIT D

ASSESSMENT OF THE ENVIRONMENTAL IMPACT OF THE SOURCES

The Ash Handling System for Crystal River Units 1 & 2 includes a transfer silo to store coal fly ash. Ash from the transfer silo is pneumatically conveyed to a storage silo to be disposed of by truck. These facilities are to be located west of existing units 1 and 2 on previsously impacted land or compacted fill-dirt. No impact to natural vegetation or wildlife is anticipated. Should failure of the ash handling system occur, ash will be conveyed by means of seawater into the existing ash pond (refer to FDER Permit No. IC-09-5875).

The noise generated by construction of this facility will probably not be greater than noise emitted by existing operating facilities.

The only significant impact of this system is in terms of changes in air quality. Reference is made to FPC Dwg. No. CR-L2-A-4 for source locations and Florida Power Corporation's modified application for the Crystal River Ash Handling System (submitted April 6, 1978) for definition of hourly contributions of ash to the air.

EXHIBIT E

CALCULATION SHEET

ASH HANDLING SYSTEM AIRBORNE CONTAMINANTS

CRYSTAL RIVER 1 & 2 COAL CONVERSION

Source 1: Unit 1 Conveying Line Bag Filter

Forty-four tons per hour (max design) of ash is drawn from Unit 1 precipitator through the separator where 96% of the ash is removed and flows into the transfer silo. The remaining ash and air enter the bag filter where 99.9% of the ash is removed with the air exhausted through the vacuum blowers. Actual discharge estimate based on 96% efficient separators and 99.9% efficient bag filter.

Process Weight

Design fly ash rate from Unit 1 precipitator	44 tons per hour

Actual Discharge

44 TPH x 0.04 x 0.001	3.52 lbs. per hour (15.4 tons per year)

Source 2: Transfer Silo Vent Bag Filter

Air is vented from the transfer silo through a bag filter to remove air from the following sources: (1) air displaced in the silo from the entering ash, and (2) heated air entering the silo (268 ACFM) to keep the ash fluid. Total ash flow into the silo is from the Unit 1 and 2 separators. The maximum design ash flow rate from Unit 1 precipitator is 44 tons per hour and from each of the two Unit 2 precipitators is 27.5 tons per hour. The separators remove 96% of the ash. Actual discharge estimate based on 13 grains per ACF bag filter inlet loading (source: Black & Veatch) and 99.9% efficient bag filter.

Process Weight

(44 TPH + 27.5 TPH + 27.5 TPH) x .96 — 95.04 tons per hour

Actual Discharge

$13 \frac{gr}{ACF} \times 268 \text{ ACFM} \times \frac{60 \text{ min}}{hr} \times \frac{lb}{7000 \text{ gr}} \times .001$ — 0.03 lbs. per hour (.13 Tons per year)

Source 3: Storage Silo Vent Bag Filter

One hundred tons per hour (max design) of fly ash is conveyed from the transfer silo to the storage silo with 5000 actual cubic feet per minute of air. Also, 300 ACFM fluidizing air is supplied into the silo. After entering the silo, the air is vented through the bag filter. Actual discharge estimate based on 13 grains per ACF bag filter inlet loading (source: Black & Veatch) and 99.9% efficient bag filter.

Process Weight

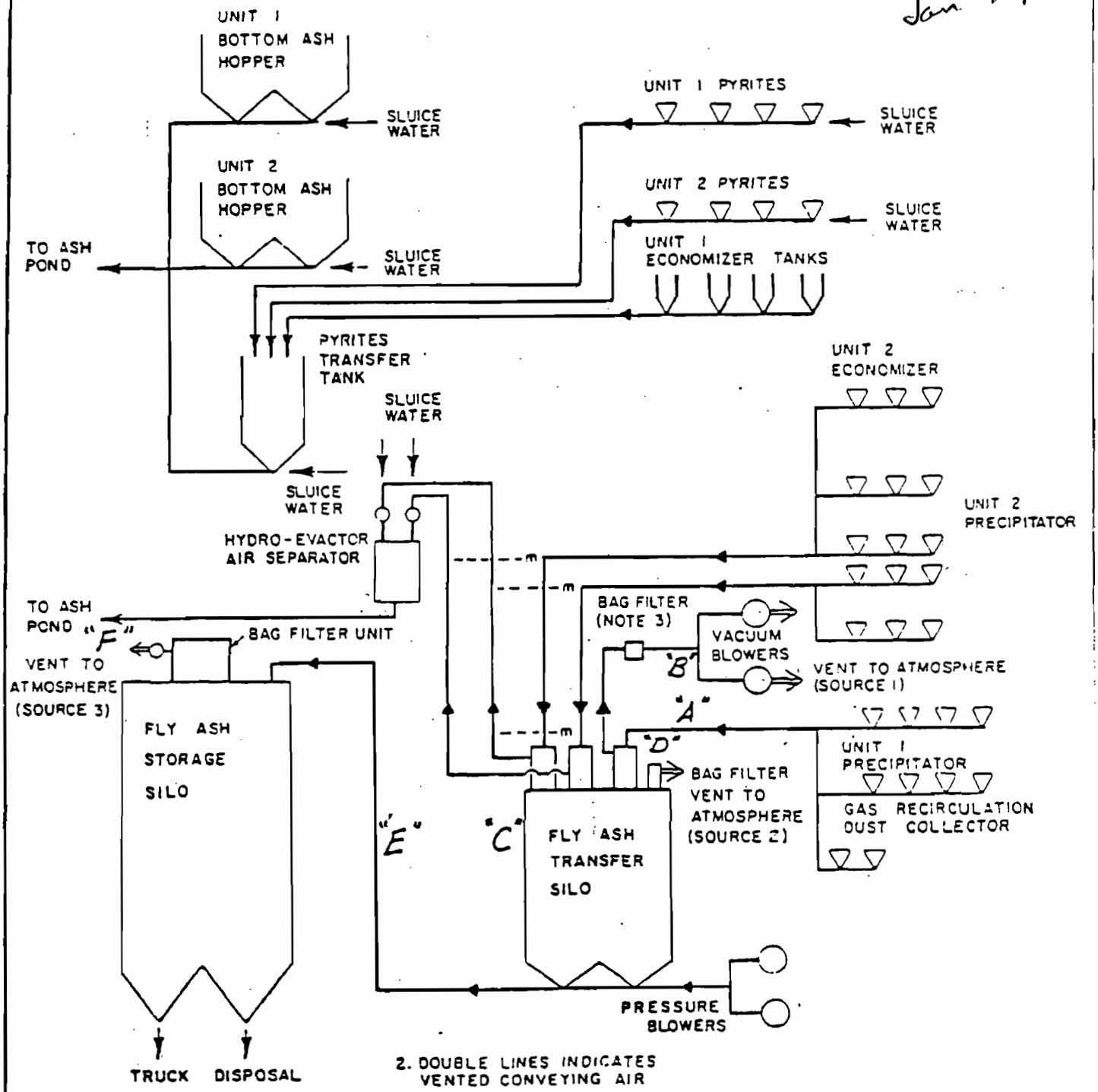
Max. design fly ash rate to storage silo — 100 tons per hour

Actual Discharge

$13 \frac{gr}{ACF} \times 5300 \text{ ACFM} \times \frac{60 \text{ min}}{hr} \times \frac{lb}{7000 \text{ gr}} \times .001$ — 0.59 lbs. per hour (2.58 tons per year)

FLORIDA POWER CORPORATION
SYSTEM ENGINEERING DEPARTMENT

Jan 79



NOTE:

1. DOTTED LINE INDICATES EMERGENCY FLY ASH DISPOSAL.
2. DOUBLE LINES INDICATES VENTED CONVEYING AIR
3. BAG FILTER DISCHARGES ASH TO TRANSFER SILO DISCHARGE

REVISIONS		
NO	DATE	
1	12-28-78	ADDED VENTS
2	5-9-78	RELOCATE VENTS
3	6-20-78	ADDED DETAILS

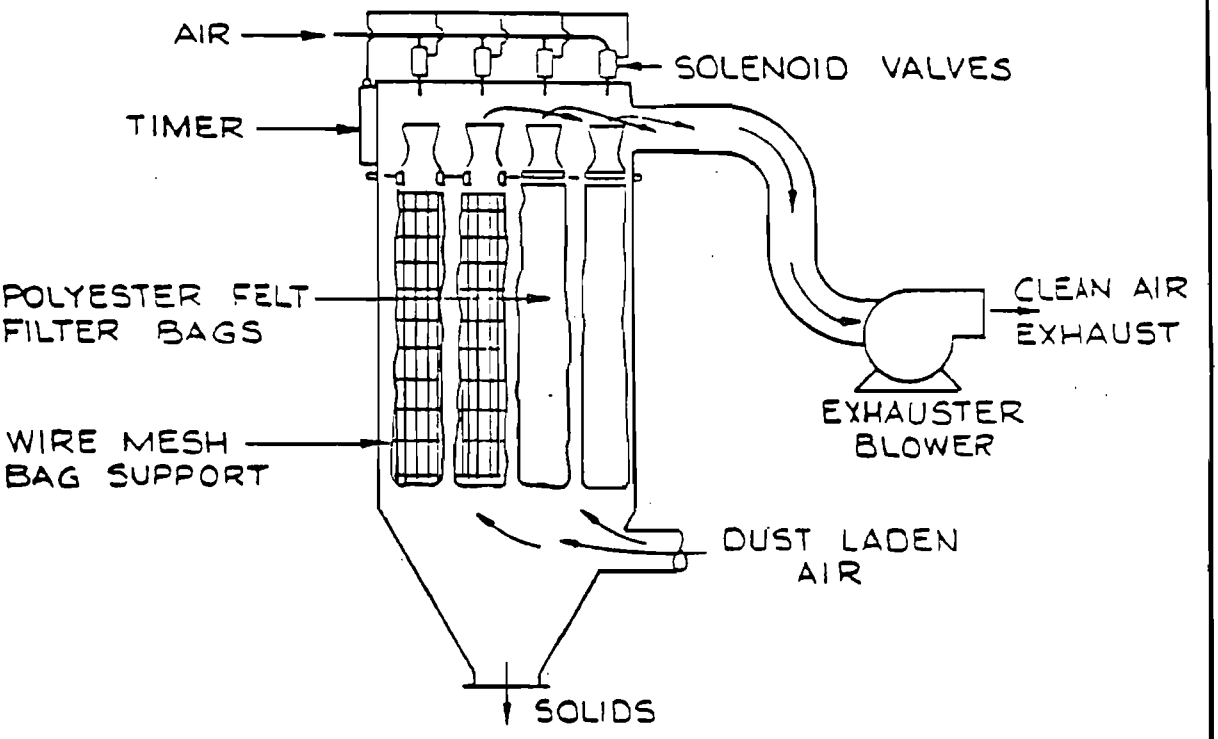
CRYSTAL RIVER UNITS 1 & 2

ASH HANDLING SYSTEM
COAL CONVERSION

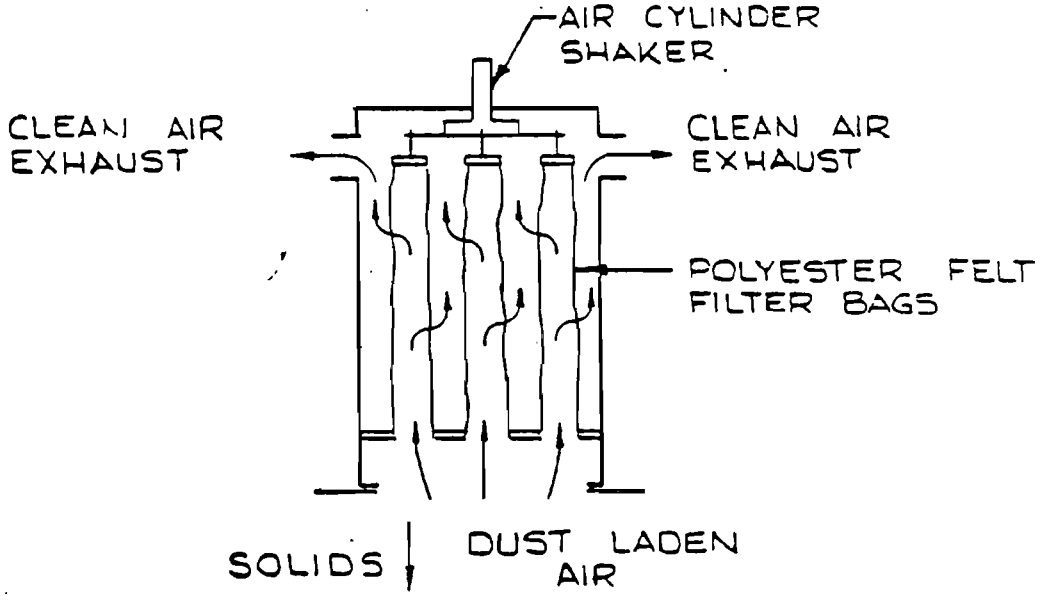
DRAWN BY	Vbeau
DATE	10-6-77
CHECKED	
APPROVED	
SCALE	Not Shown

DWG NO CR 1 2 & 2

FLORIDA POWER CORPORATION
SYSTEM ENGINEERING DEPARTMENT



SOURCE 1 & 3



SOURCE 2

REVISIONS		
NO	DATE	

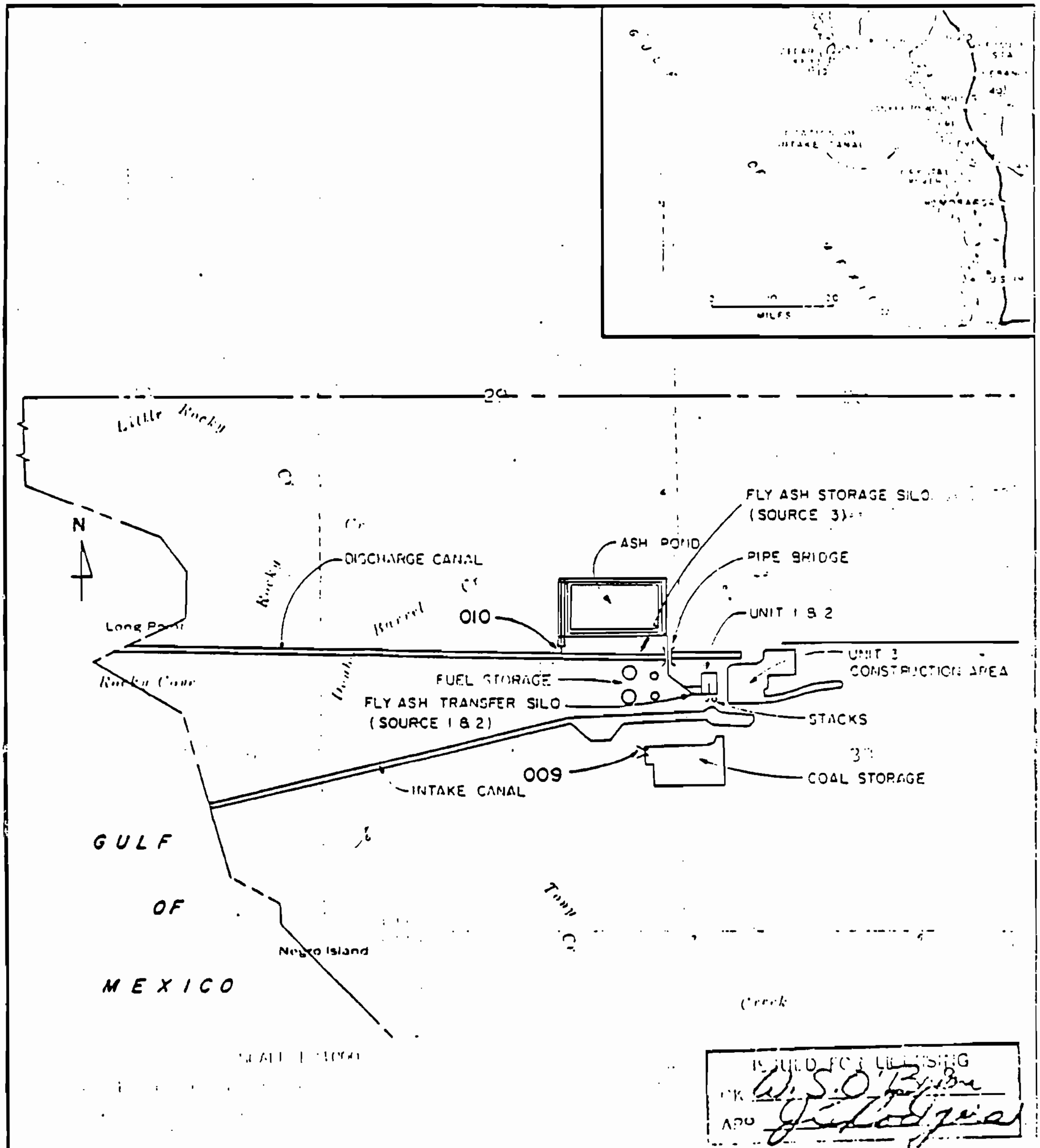
CR-CC Fly Ash Handling System Bag Filter Unit Schematic

DRAWN BY	R.B ~~ETS~~
DATE	6/22/78
CHECKED	
APPROVED	
SCALE	NONE

DWG. NO. CR1&2-L4-A-0

FLORIDA POWER CORPORATION

SYSTEM ENGINEERING DEPARTMENT



REVISIONS		
NO	DATE	
1	[illegible]	ADDED FLY ASH SILO [illegible]

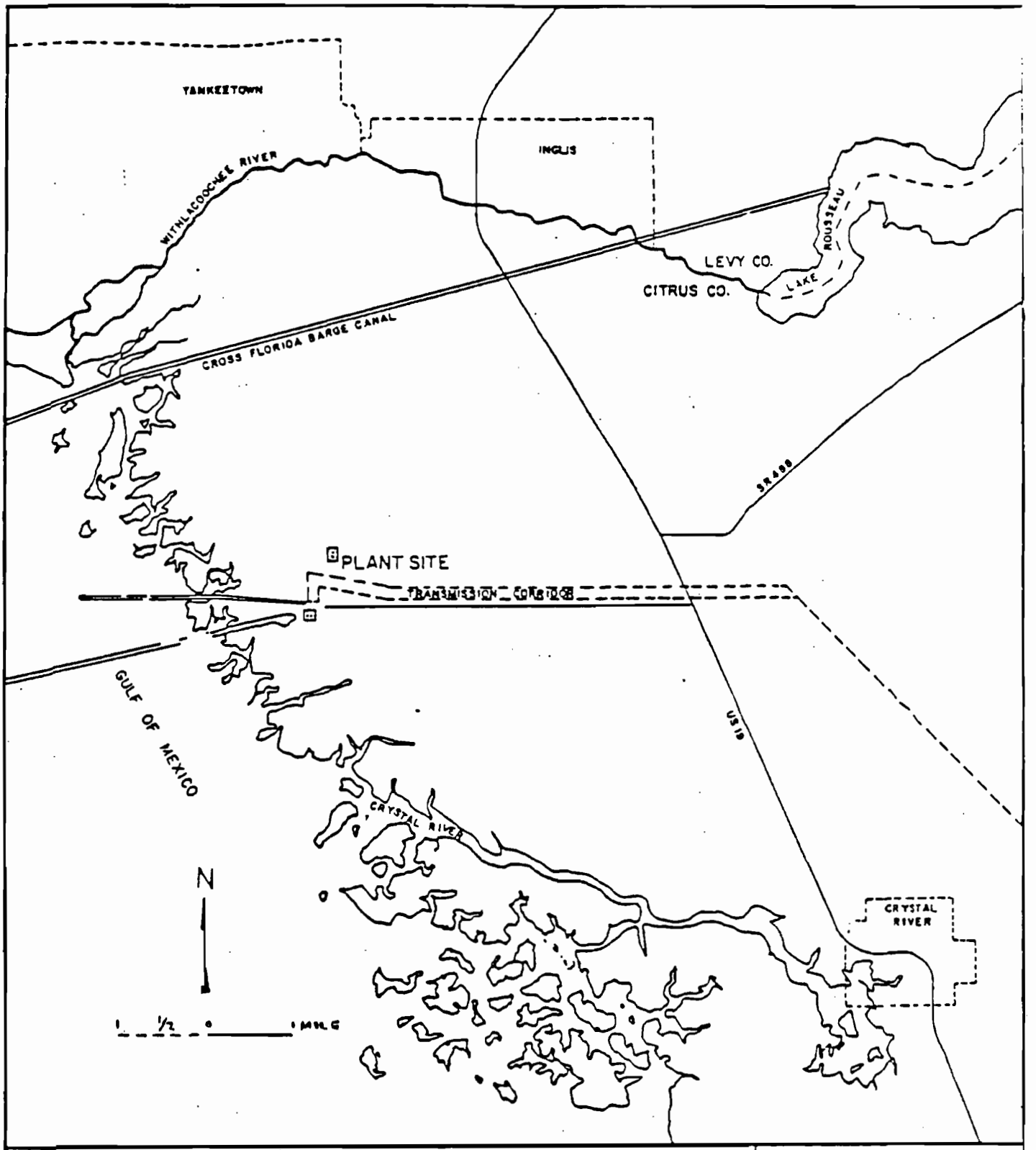
KEY PLAN
WASTEWATER DISPOSAL

DRAWN BY	JRH
DATE	3-16-76
CHECKED	[illegible]
APPROVED	
SCALE	

DWG. NO. CR-CC-G9-A-1

FLORIDA POWER CORPORATION

SYSTEM ENGINEERING DEPARTMENT



REVISIONS		
NO	DATE	

GENERAL AREA LOCATION MAP

DRAWN BY	S. MIKER
DATE	6-14-78
CHECKED	
APPROVED	
SCALE	

DWG NO CR-L3-A-0


Mikro
Pulsaire
Dust
Collectors
MikroPul

FOR MAXIMUM DUST RECOVERY

Mikro-Pulsaire

The Mikro-Pulsaire dry filter collector combines high dust collection efficiency with very low maintenance. The unit is fully automatic and self cleaning. The unique design of the Mikro-Pulsaire has eliminated all moving parts thereby contributing to minimum maintenance and maximum efficiency of operation. All controls for the Mikro-Pulsaire are located on the outside of the unit.

Reverse Jet Operation

Basically the Mikro-Pulsaire consists of a series of cylindrical filter elements enclosed in a rugged, dust-tight fabricated metal housing. The contaminated, dust-laden air enters the housing through the hopper inlet. The dust particles accumulate on the filter elements. Periodically a momentary jet of high-pressure air is "pulsed" through a uniquely designed venturi nozzle located above each filter cylinder. The primary high-pressure jet pumps secondary air as a function of the jet pump method thereby producing a "reverse-flow" of air which cleans the filter cylinders. Continuous flow of air through the Mikro-Pulsaire is maintained at all times since only a small part of the filter element is cleaned at any given time. The air jets are controlled by diaphragm valves which are activated by solenoid pilot valves and a timer.

Unique Features

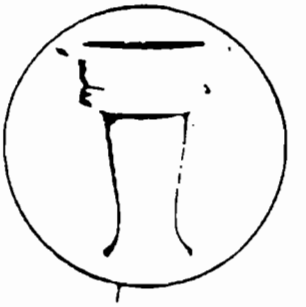
- High Dust Collection Efficiency . . . 99.9%
- Heavy Duty Construction . . . Minimum 14 Gauge
- No Internal Moving Parts
- Economical Installation . . . All Units Pre-wired
- Handles Dust Streams to 425° Fahrenheit. High temperature filter elements of DuPont "Nomex"* allows operation above most acid dew points. When extra resistance to chemicals is required DuPont Teflon* is also available for use in the filter elements.
- Installations World Wide . . . Over 60,000 installations throughout the world.
- Can be Used by Any Industry Having a Dry Dust Problem.

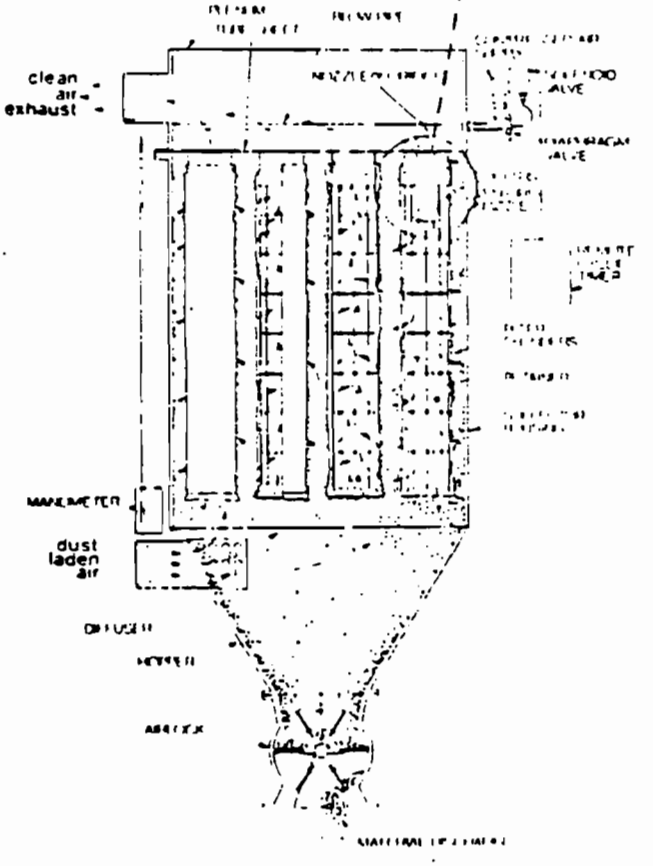
AVAILABILITY — All Mikro-Pulsaires can be supplied in three styles:

A Style — Plenum only
B Style — Plenum and Housing
C Style — Plenum, Housing and Hopper

Original MikroPul Venturi

This venturi provides maximum efficiency to the filter media and is standard equipment of all Mikro-Pulsaire dust collectors.



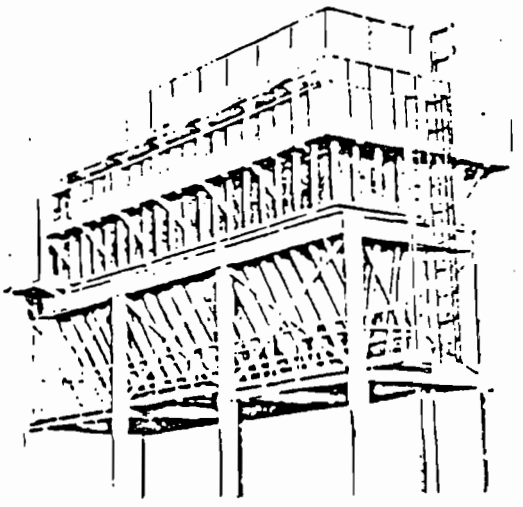


Schematic diagram showing the flow of dust laden air and the arrangement of filter cylinders in the Mikro-Pulsaire Dust Collector.

Mikro-Pulsaire is originated and manufactured solely by MikroPul Corporation

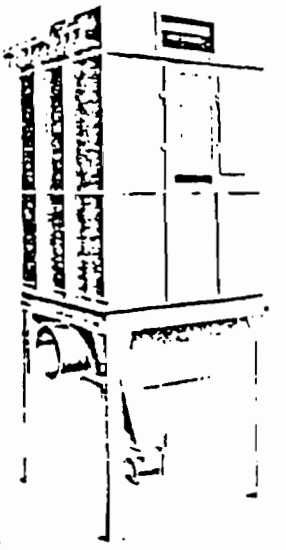
Printed in U.S.A.

Your Dust Control Problem



Modular Mikro-Pulsaire

Field-erected. Designed for the big jobs. Modular sections are readily combined for unlimited filtering capacity.

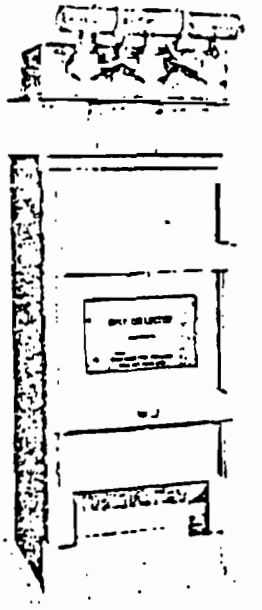


Pre-Assembled Mikro Pulsaire

Factory-assembled. Wide range of sizes from 16 to 144 filter bags. Bags are 8 and 10 ft. long.

Cylindrical Mikro-Pulsaire

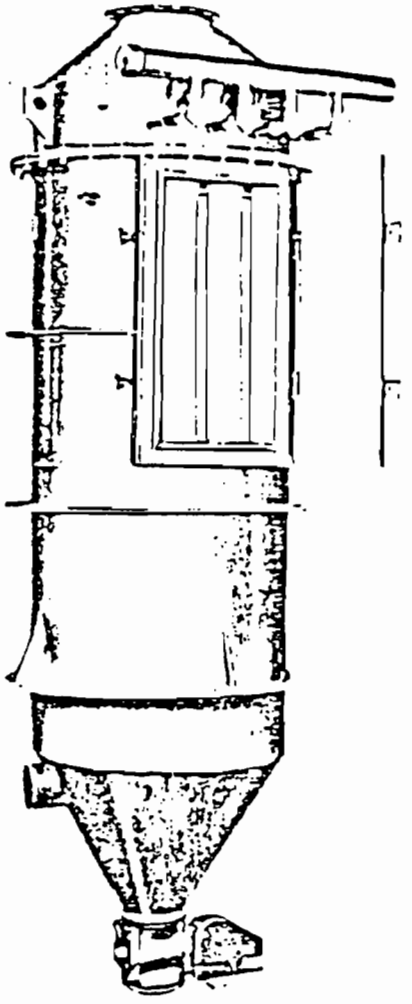
Compact, rugged round housing. Ratings standards — up to 100" H_2O and up to 220" H_2O.



Bin Vent Unit Mikro Pulsaire

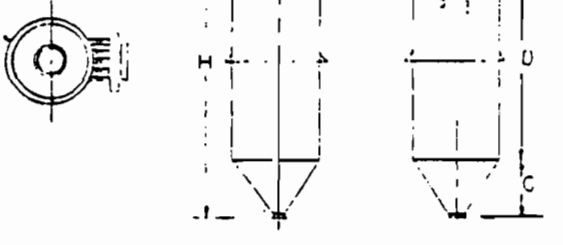
Mounts directly on receiver bins. Available with 25, 42, 63 and 84 sq. ft. of filter surface.

Cylindrical Mikro-Pulsaire



Cylindrical Housing Designed For A Wide Range Of Processing Applications

The Cylindrical Mikro-Pulsaire is factory assembled. It is fabricated of heavy duty 12 gauge steel. Available in sizes ranging from 12 to 109 filter bags. Bags are 8 and 10 feet long. This unit offers optimum space saving efficiency with maximum cloth area per square foot of floor space. The Cylindrical Mikro-Pulsaire is being successfully used in a broad field of industrial processes including spray drying, separating, mixing, carloading and many other processes requiring the recovery of materials or the control of dust problems.



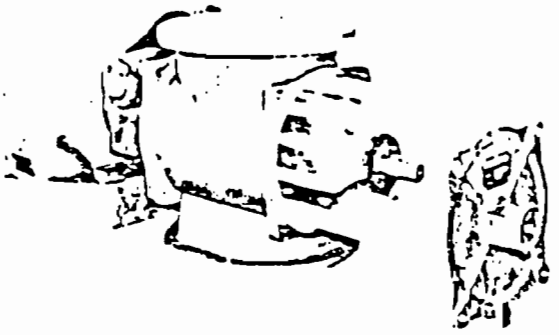
Specifications

Cylindrical Series

8 Ft. and 10 Ft. Filter Tubes

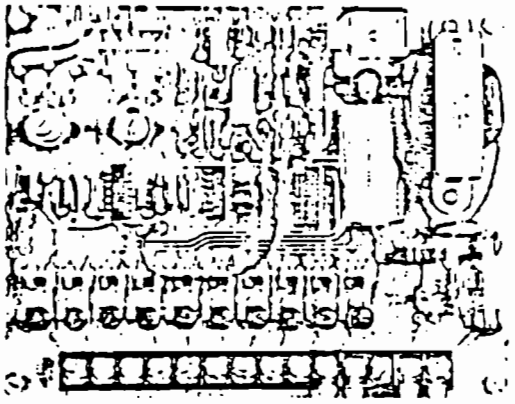
Model	12		19		25		31		42		55		69		85		97		109	
	-8-160	-10-160	-8-130	-10-130	-8-105	-10-105	-8-70	-10-70	-8-55	-10-55	-8-40	-10-40	8-30	10-30	8-30	10-30	8-20	10-20	8-20	10-20
Number of Filter Bags	12	12	19	19	25	25	31	31	42	42	55	55	69	69	85	85	97	97	109	109
Filter Area / Ft²	113	141	178	224	236	271	292	364	395	495	518	648	649	812	809	1012	914	1142	1026	1283
Approx. Wt.	850	900	960	1075	1175	1300	1300	1450	1625	1800	1950	2150	2500	2725	2700	3000	3175	3610	3175	3610
Dim. A	30	30	36	36	42	42	48	48	54	54	60	60	72	72	72	72	84	84	84	84
Dim. C	19½	19½	24½	24½	31½	31½	37½	37½	43½	43½	49½	49½	61½	61½	61½	61½	73½	73½	73½	73½
Dim. B	16½	16½	17½	17½	18½	18½	19½	19½	20½	20½	21½	21½	24½	24½	25½	25½	26½	26½	27½	27½
Dim. D	108	132	108	132	108	132	108	132	108	132	108	132	108	132	108	132	108	132	108	132
Dim. H	138½	162½	150½	174½	157½	181½	162½	186½	169½	193½	174½	198½	186½	212½	187½	213½	200½	226½	200½	226½

MIKRO-PULSE ACCESSORIES



Mikro Airlock

The Mikro-Airlock is a precision-built rotary valve for continuous discharge from dust collectors, cyclones, pulverizers, blenders, mixers, screw conveyors, and storage bins. It is ideal for feeding pulverizers, pneumatic conveying systems, mixers, and blenders. The Mikro-Airlock is available in 8" and 14" sizes, for both high and low pressure applications. Metal, rubber and plastic rotor vanes are available.



Model 72 Integrated Cyclic Timer

The Model 72 Integrated Cyclic Timer is an all solid state sequential type, capable of switching 10 independent outputs. Each output has a switching capacity of one amp at 115V. It is mounted on a glass reinforced circuit board. All timers are completely wired for ten outputs as received.

It is reliable for millions of cycles of operation and eliminates mechanical or electrical problems common to mechanical timers or relays.

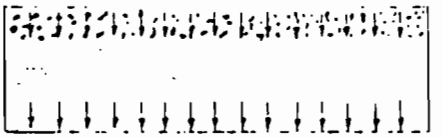
HCE Treated Felt Filter Medium

MikroPul pioneered the use of advanced, more efficient filter media to meet the increasingly higher temperature requirements. A patented HCE treatment further adds to the dust collection efficiency of all filters used in the Mikro-Pulsaire.

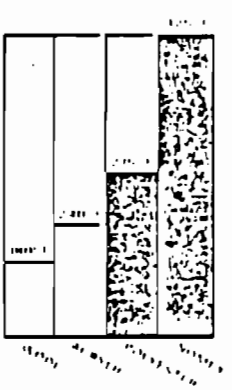
Cost, efficiency, physical conditions — such as temperature and humidity — and chemical compatibility with both solid and gas streams should be considered in selecting the proper filter medium.

The following filter materials are available for use in the Mikro-Pulsaire:

1. Wool Felt, for temperatures to 180 F
2. Polypropylene, for temperatures to 200 F
3. Acrylic, for temperatures to 240 F
4. Polyester, for temperatures to 275 F
5. Nomex Felt, which will handle effluents to 425 F
6. Teflon filter bags can be supplied for special chemical applications.



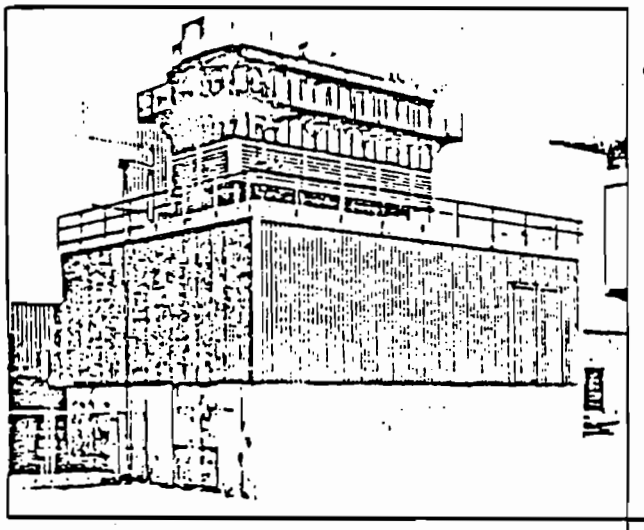
Felt Media
Dense felt that excludes submicron particles will filter air at a far higher rate than woven cloth when high pressure cleaning jets are used. Drawing above illustrates heavily matted texture of felt that traps particles while a uniform volume of air flows through.



"NOMEX" For High Temperatures to 425 F

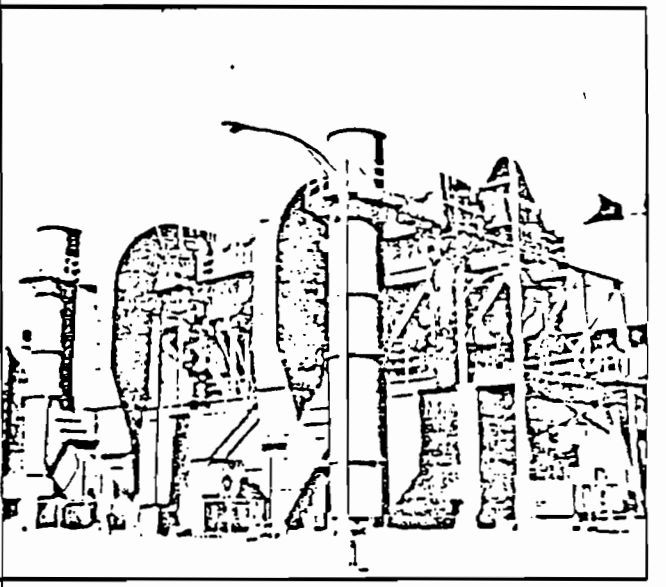
Nomex is a continuous filament yarn specially developed by DuPont to meet the need for an industrial fiber with good heat resistant characteristics. MikroPul offers this outstanding material in felted filter bags — and unlike fragile glass cloth elements, it can be twisted, folded, or pulled in any direction — shipped, handled and installed with only normal care — all without damage.

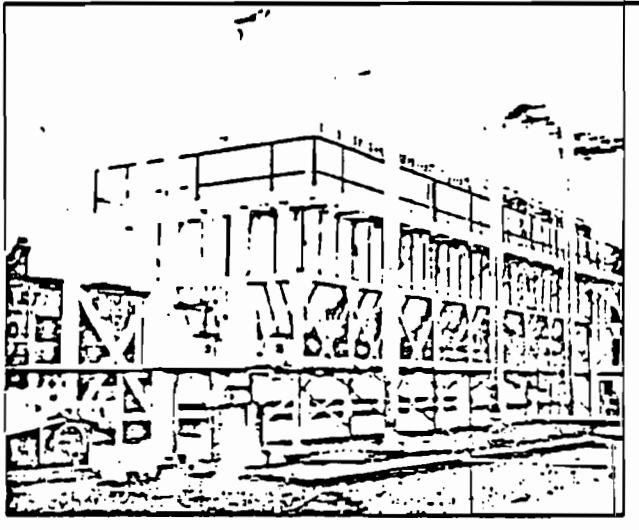
More Efficiently And Economically



◊Atmospheric Air Cleaning

Cement◊ Industry

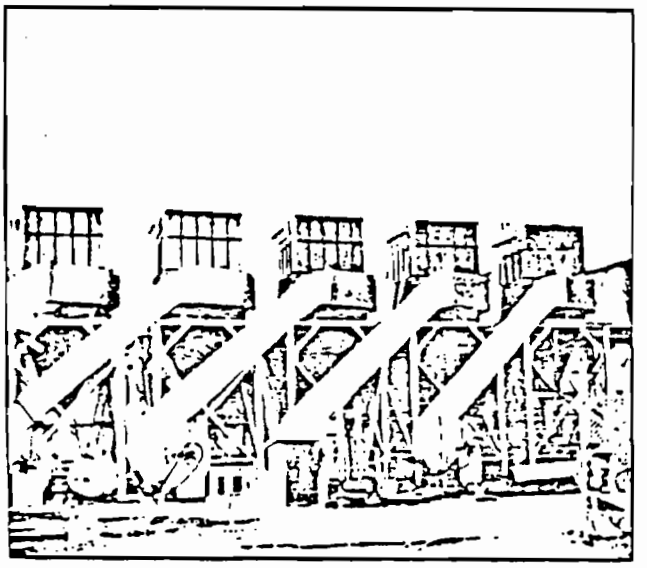




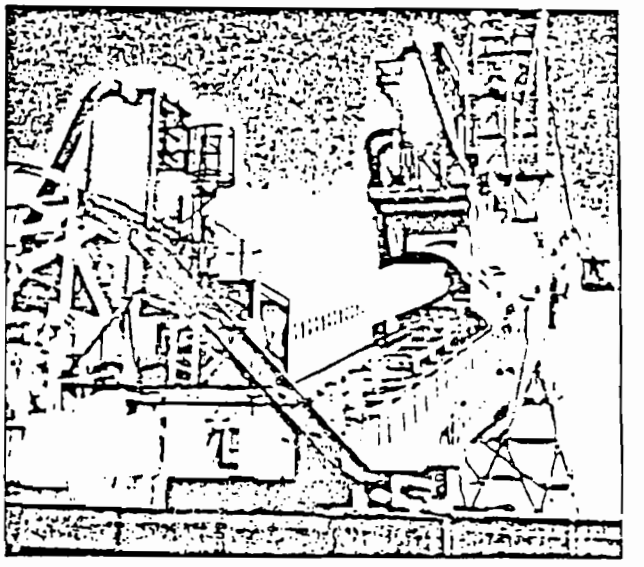
◊Materials Handling

A Variety of Fields

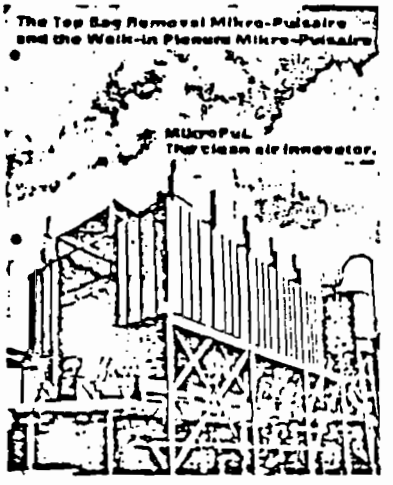
Woodworking Industry



Nuisance Venting

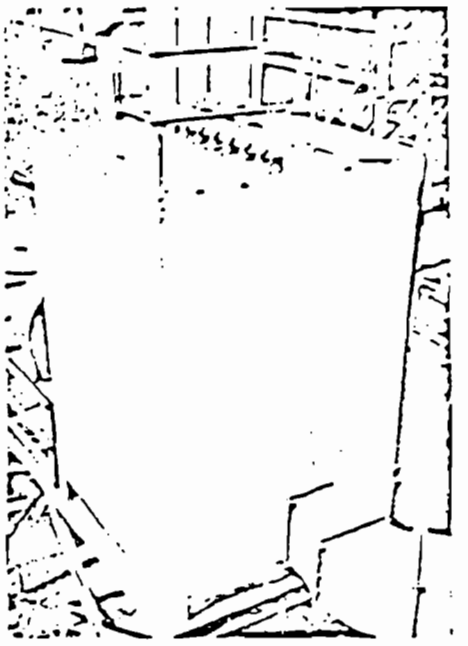


Other Mikro-Pulsaires Are Available...



The Top Bag Removal and Walk-In Plenum Units along with the series "W" Filter Collectors are also available from MikroPul. For detailed information covering these units write for catalogs TRP-1 and CPW-1.

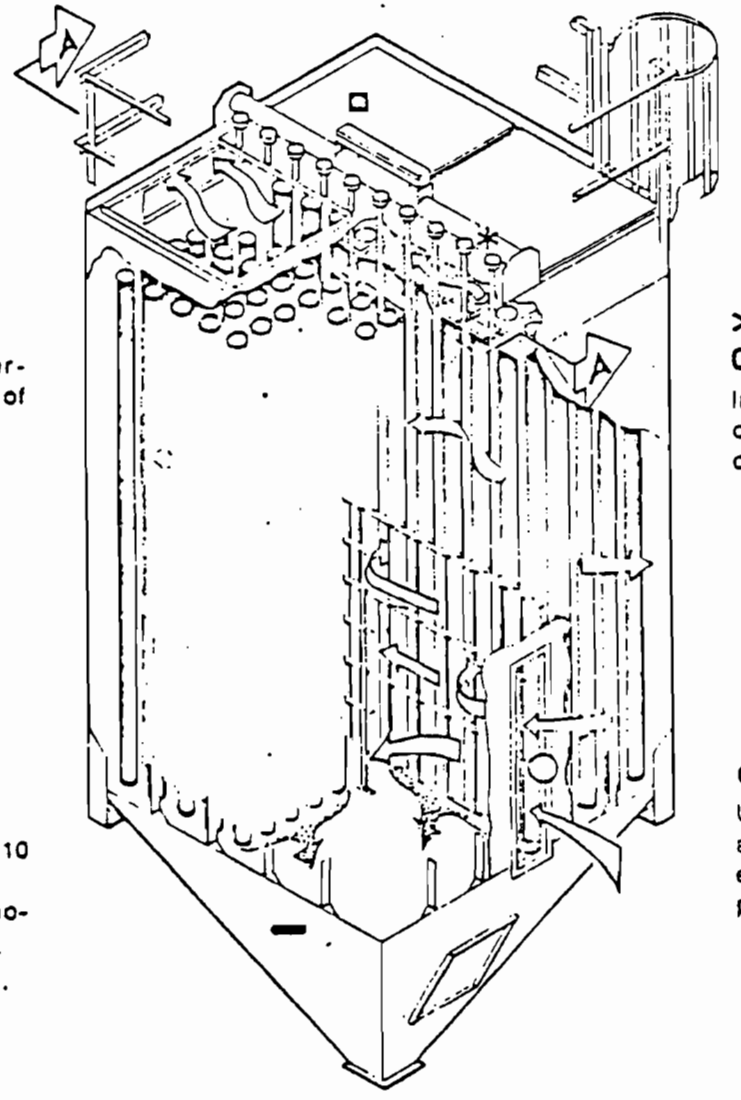
THE PulseKing CONCEPT



RESULTS IN Improved filtration efficiency while compressed air requirements, fan horsepower, maintenance, and other cost factors are actually reduced.

PERMITS low cost mass production.
low cost installation.

SAVES time, space, and money.



□ TOP ACCESS
All maintenance performed on clean side of system.

✻ HIGH CAPACITY CLEANING SYSTEM
Improves efficiency. Reduces compressed air consumption.

— HEAVY DUTY CONSTRUCTION
All welded reinforced 10 gauge plate—
all heavy duty components.

○ CENTER INLET
Unique design improves airflow. Minimizes re-entrainment. Reduces pressure drop.

APPLICATIONS:

In-plant Dust Control
Air Pollution Control
Valuable Product Processing

OFFERS:

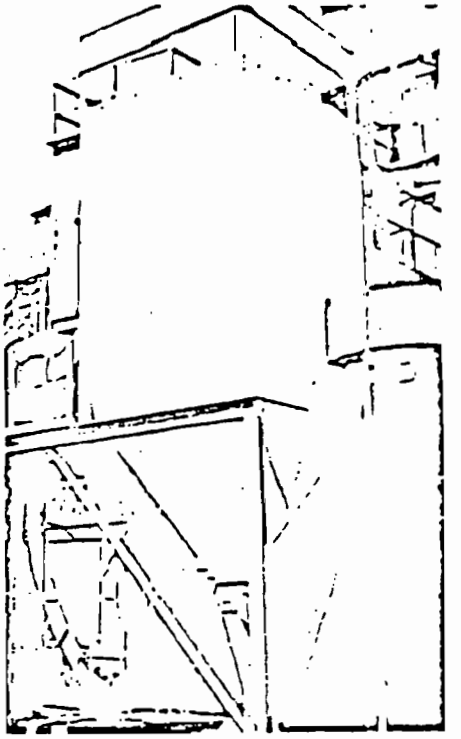
Low Initial Cost
Lower Operating Cost
Minimum Maintenance
Design Flexibility
Compactness
No Internal Moving Parts
External Servicing

FEATURES:

A Better Cleaning Technique
Unique Center Inlet Design
Rugged Heavy Duty Construction
All Modular Welded Shop Assembly
Fully Automatic and Adjustable Operation
Quick Change Filter Design
8' Wide X 8' High X 22' Long Shipping Dimensions

PulseKing

The PulseKing collector embodies the most advanced concepts in reverse-pulse filters. It captures plus 99.9% of all normal dust loads . . . captures dust particles of sub-micron size, even metallic fumes. This is better performance than that required by virtually all local or national air quality standards.



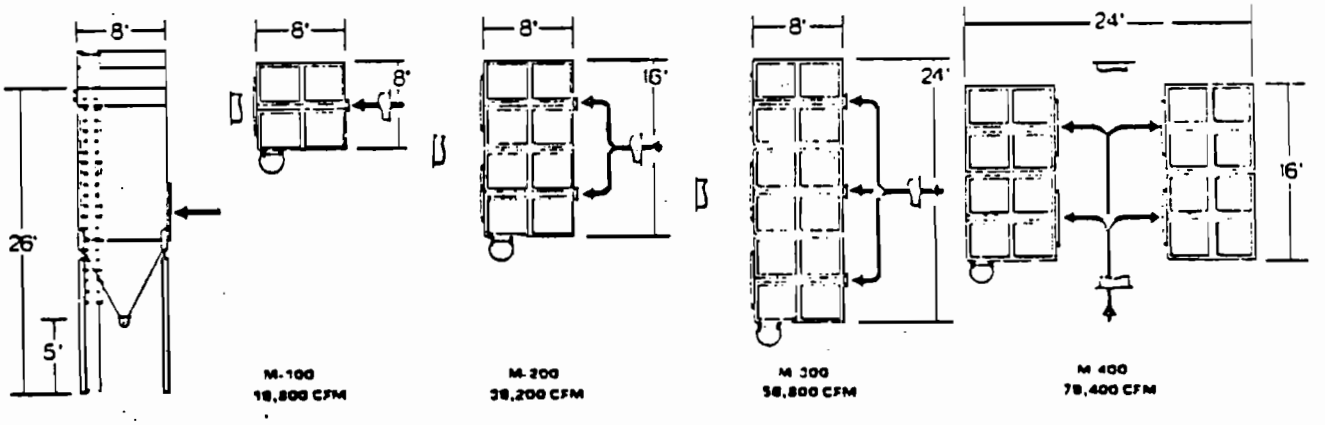
THE PulseKing SYSTEM

Provides high through-put with minimum cloth filtering area in a compact unit requiring ⅓ to ¼ the floor space of conventional "bag house" collector for the same application.

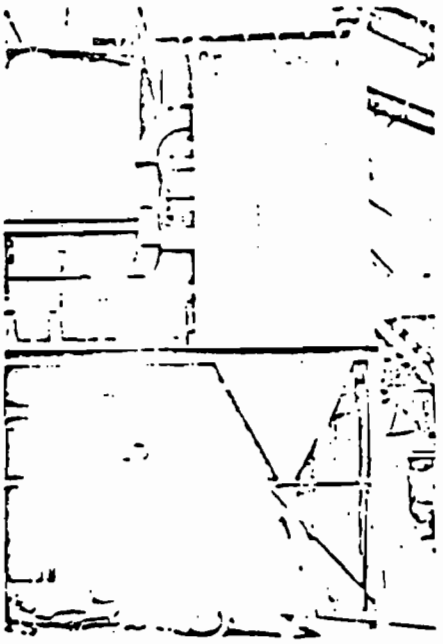
The selection of PulseKing for a specific job is normally based on an air-to-cloth ratio of 5 to 15 cfm per square foot of filtering media. Specific applications will vary according to the chemical and physical nature of the dust.

TYPICAL MODULE CONFIGURATIONS

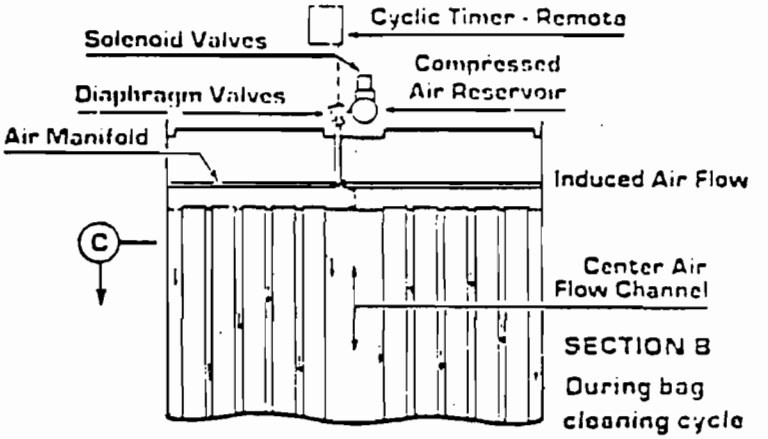
Volumes typical for fugitive dust applications.



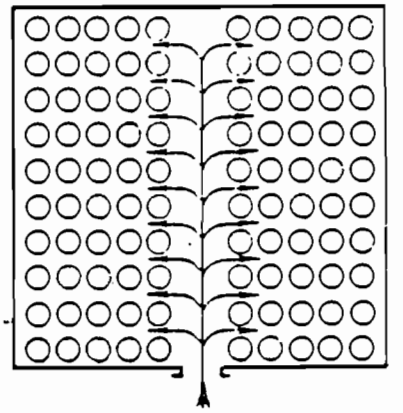
All configurations feature *single* point inlets and *single* point outlets which may also be on the same side rather than opposite as indicated above.



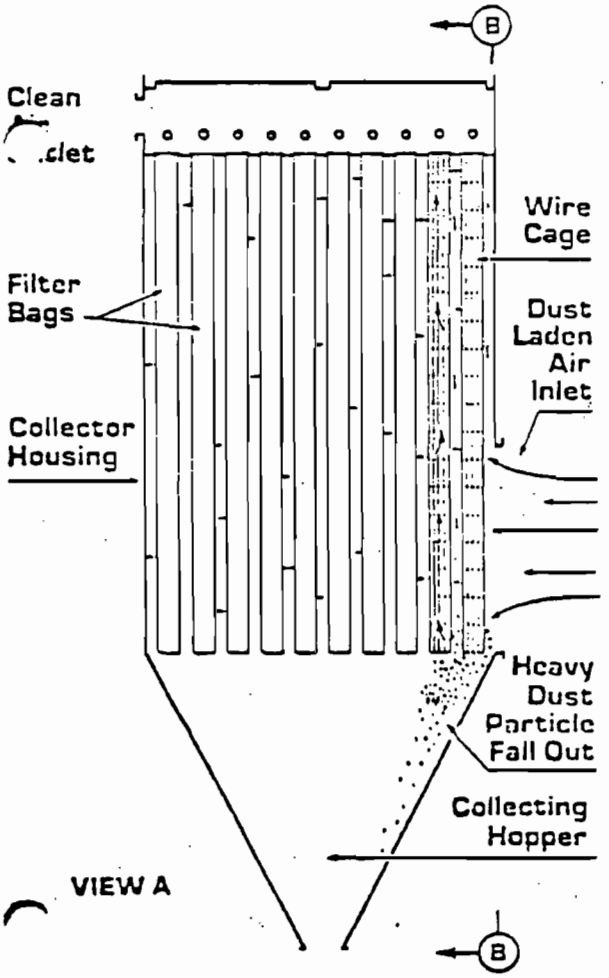
Standard filtering media for the PulseKing is 16 ounce polyester felt which has a temperature limitation of 275°F. Other types of material are available, including NOMEX felt for high-temperature applications (425°F. max). Bag dimensions are 6¼" x 12'-0".



SECTION B
During bag cleaning cycle

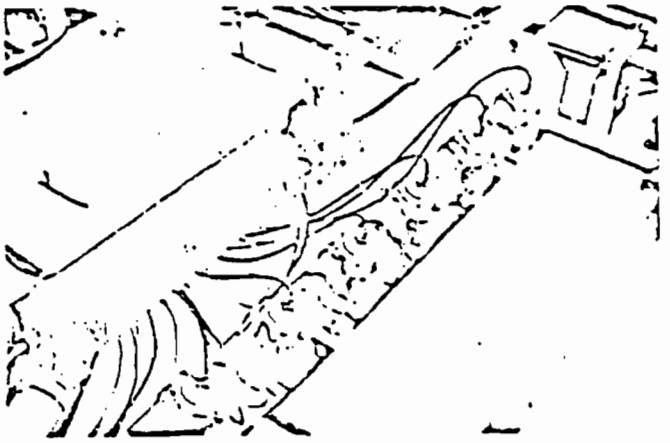


SECTION C
Showing flow pattern of incoming dust laden air



SOLID STATE TIMER

Adjustment of the duration of the pulse (20 to 200 milliseconds) and the interval (2 to 60 seconds) can be made during operation. The adjustable feature permits the PulseKing to be operated at peak efficiency using a minimum of compressed air.



YOU'LL BUY PulseKing

Compare before you purchase . . . be sure to check the following:

250% more cleaning capacity . . . low compressed air consumption

Improves air flow . . . Minimizes re-entrainment of dust thus reducing compressed air consumption and reduces pressure drop across collector . . . lowers operating cost.

All 10 gauge construction including hopper and walls — Heavy duty components — increases useful life of collector.

Factory assembled all-welded PulseKing collectors reduce erection costs by as much as one-third to two-thirds that of other conventional units. *No* bags and cages to install. *No* compressed air headers to install, and *No* hoppers to install in the field.

Standard items on PulseKing systems are extra with many competitors. Rotary airlock, Inlet manifold,† Outlet manifold,† Support with 5' clearance under hopper, Installation of bags, Enamel finish coat of paint on collector, Ladder & cage, Handrail and toeboard are all *Standard* on PulseKing.

† Required on multiple units

Model* Number	FILTER AREA (SQ. FT.)	AIR-TO-CLOTH RATIO (CFM/SQ. FT.) 6/1 (CFM)	8/1 (CFM)	10/1 (CFM)	12/1 (CFM)	15/1 (CFM)	COMPRESSED** AIR REQ'D. (SCFM 90 to 100 PSI) AVERAGE—MAX.
M 50S	980	5,880	7,840	9,800	11,760	14,700	5 0 to 15 0
M100S	1,960	11,760	15,680	19,600	23,520	29,400	10 to 30
M150S	2,940	17,640	23,520	29,400	35,280	44,100	15 to 45
M200S	3,920	23,520	31,360	39,200	47,040	58,800	20 to 60
M250S	4,900	29,400	39,200	49,000	58,800	73,500	25 to 75
M300S	5,880	35,280	47,040	58,800	70,560	88,200	30 to 90
M350S	6,860	41,160	54,880	68,600	82,320	102,900	35 to 105
M400S	7,840	47,040	62,720	78,400	94,080	117,500	40 to 120
M450S	8,820	52,920	70,560	88,200	105,840	132,300	45 to 135
M500S	9,800	58,800	78,400	98,000	117,600	147,000	50 to 150
M550S	10,780	64,680	86,240	107,800	129,360	161,700	55 to 165
M600S	11,760	70,560	94,080	117,600	141,120	176,400	60 to 180

*Corresponds to number of bags.

**Compressed air consumption will vary with the characteristics of the dust, the dust load in the air stream (grain loading), air-to-cloth ratio and the desired pressure drop across the bag.

BROOKS • Mc MICHAELS can provide complete systems, including exhaust hoods, ducts, controls, wiring, structures, foundations, material handling systems, fans, stacks. All or any part of your requirements can be furnished installed, with start-up and training of your personnel for operation and maintenance.

For Additional Information & Technical Assistance Please Write or Call

BROOKS • McMICHAELS CORP.
329 RELIANCE ROAD
TELFORD, PENNSYLVANIA 18969
215/723-0384

Sold and serviced by

ATTACHMENT B

STUDY GROUP RECOMMENDATIONS

State of Florida

DEPARTMENT OF ENVIRONMENTAL REGULATION

INTEROFFICE MEMORANDUM

For Routing To District Offices And/Or To Other Than The Addressee	
To: _____	Loctn.: _____
To: _____	Loctn.: _____
To: _____	Loctn.: _____
From: _____	Date: _____

TO: J. P. Subramani

ATTENTION: Vicki Martinez

THRU: P. David Puchat

FROM: William H. Brown

DATE: December 13, 1978

SUBJECT: Crystal River Units 1 & 2 Fly Ash Handling System BACT

Concerning ourself to only the fly ash transfer system and silo, all are vented to the atmosphere thru baghouses.

The conveying line handles 44 T/hr. from ESP thru separator (96% removal), baghouse (99.9%+ removal) resulting in 3.52 lb/hr TSP emitted to the atmosphere. The transfer silo baghouse has an efficiency of 99.9%+ equal to an emission rate of .03 lb TSP/hr.

The storage silo, with 99.9%+ efficiency, has an emission rate of .59 lb. TSP.hour.

I believe that this process of using fabric baghouses for TSP control is the best available control technology. Therefore, I recommend the BACT determination for this facility be as follows:

1) Visible emissions not to exceed 5% opacity at any time.

2) Conveying Line Bag Filter: TSP emissions not to exceed 3.52 lbs/hr.

3) Transfer Silo Vent Bag Filter: TSP emissions not to exceed 0.03 lbs/hr.

4) Storage Silo Vent Bag Filter TSP emission not to exceed 0.59 lbs/hr.

WHB/rkt

12-15-78

H6 - Rev 7/76

Gulf Power Company
Post Office Box 1151
Pensacola, Florida 32520
Telephone 904-434-8354

George O. Layman
Director of Power Supply

Gulf Power

December 6, 1978

Mr. Walter E. Starnes
Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32301

Dear Mr. Starnes:

Ref: BACT Florida Power Corporation
Crystal River Units 1 & 2

I have reviewed the applications transmitted with your letter of November 22, 1978, filed by Florida Power Corporation for particulate control equipment to be utilized at Crystal River Units 1 & 2 in a modification to the fly ash collection system. The equipment as described in the application has been utilized by material handling industries for many years. It has proven to be reliable, efficient, and cost effective.

The equipment that has been described is a forerunner of the large baghouses that are now being offered by vendors to the utility industry for collection of fine particulate matter.

During the research project at our Scholz Electric Generating Plant concerning flue gas desulfurization, similar equipment was utilized in the handling of lime, limestone, and soda ash. The operational record was excellent and no plume or emissions were visible from the source.

The equipment, as specified by Florida Power Corporation, is of good engineering design and proven capabilities and should meet all the specifications as set forth and allow Florida Power Corporation to comply with the rules of the Department of Environmental Regulation. This equipment is a "State of the Art" for control technology of this small emission source.

Yours very truly,

George O. Layman

GOL:en

Victoria Martinez

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

INTEROFFICE MEMORANDUM

For Routing To District Offices And/Or To Other Than The Addressee

To: _____ Loctn.: _____
To: _____ Loctn.: _____
To: _____ Loctn.: _____
From: _____ Date: _____

TO: J. P. Subramani

FROM: Michael D. Harley

DATE: December 15, 1978

SUBJ: Crystal River Units 1 & 2 Fly Ash Handling Systems

In many respects, this is one of the most complete applications for a determination of Best Available Control Technology that I have been asked to review. However, it is woefully inadequate in certain vital areas. These areas include sections E, F, and G of the form which requests information establishing the performance and availability of the proposed technology. The omission of this information makes an adequate evaluation of the application impossible. Since the district office has determined the application to be complete, an evaluation must be made on the basis of the data supplied.

The data supplied by the applicant establishes that the selected control devices (baghouses) are generally available. The information supplied by Florida Power Corporation indicates that the selected devices can be designed to provide a removal efficiency of 99.9% by weight. However, no information was provided which established the ability of the system to perform within design for the specific application. The applicant appears to have utilized sound principles. An analysis of alternatives by Florida Power Corporation would have provided the necessary support for the selection of Best Available Control Technology. The applicant did establish a positive socio-economic impact.

Under the circumstances, I must recommend that Best Available Control Technology for the source consist of:

SOURCE	CONTROL DEVICE	EMISSION RATE
Unit 1 Conveying Line	Baghouse	3.52 lbs/hr
Transfer Silo Vent	Baghouse	.03 lbs/hr
Storage Silo Vent	Baghouse	.59 lbs/hr

The acceptance of the application form as complete without sections E, F, and G limited the BACT choice either to the one requested, or a refusal.

MDH:ht

12-20-78

Walt S.
Victoria M.

REUBIN O'D. ASKEW
GOVERNOR

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
ST. JOHNS RIVER SUBDISTRICT
GAINESVILLE BRANCH OFFICE
825 NORTHWEST 23rd AVENUE
GAINESVILLE, FLORIDA 32601

JOSEPH W. LANDERS, JR.
SECRETARY

December 7, 1978

TO: J. P. Subramani

THRU: Frank Darabi

FROM: Greg DeMuth

RE: Crystal River Units 1 & 2 Fly Ash Handling System

In response to your memorandum dated November 21, 1978 concerning the BACT determination for the above source, we agree with the selection of a baghouse with 99.9% particulate removal efficiency following the precleaners.

When the permit is issued, the filter velocity should be checked to assure that it is within acceptable limits and consideration given to some type of pressure drop activated alarm system to detect bag blinding or bag tearing.

12.12.78

GD/sa