STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

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

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

December 23, 1986

Mr. Wayne Aronson
Air Programs Branch
Air, Pesticides, and Toxics
Management Division
U.S. EPA - Region IV
345 Courtland Street, N.E.
Atlant, Georgia 30365

Dear Mr. Aronson:

Re: Final Determination - South Broward County Resource Recovery Facility

In response to Mr. Bruce Miller's request of October 9, 1986, and several recent discussions with Barry Andrews we have prepared the final determination for the above referenced project and have enclosed a copy of the public notice. Because we have the final determination on our word processor, we will make any changes that you wish and send you a corrected copy of the appropriate pages the next day. Please call any changes directly to Barry Andrews at (904)488-1344.

Sincerely,

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

CHF/ks

cc: Tom Henderson
Gary Carlson
Isidore Goldman

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NOTICE OF CERTIFICATION HEARING ON AN APPLICATION TO CONSTRUCT AND OPERATE AN ELECTRICAL POWER PLANT ON A SITE TO BE LOCATED NEAR FORT LAUDERDALE, FLORIDA

1. Application number PA 85-21 for certification to authorize construction and operation of an electrical power plant near Fort Lauderdale, Florida, is now pending before the Department of Environmental Regulation, pursuant to the Florida Electrical Power Plant Siting Act, Part II, Chapter 403, F.S. Certification of this power plant would allow construction and operation of a new source of air pollution which would consume an increment of air quality resources. The department review has resulted in an assessment of the prevention of significant deterioration impacts and a determination of the Best Available Control Technology necessary to control the emission of air pollutants from this source.

2. The proposed 248 acre resource recovery and landfill site is located in unincorporated Broward County at the southeast quadrant of the intersection of U.S. 441 and State Road 84. The facility site is directly across the South Fork New River Canal from a Florida Power and Light Company power plant. The proposed plant will consist initially of a 68.5 MW unit Solid Waste-Fired Energy Recovery facility. The power plant will be owned by a vendor with Broward County as the prime customer or "anchor tenant" of the project.

3. The Department of Environmental Regulation is evaluating the application for the proposed power plant. Certification of the plant would allow its construction and operation. The application is available for public inspection at the addresses listed below.

to the consideration of the site. Need for the facility has been predetermined by the Public Service Commission at a separate hearing. Written comments may be sent to William J. Kendrick (Hearing Officer) at Division of Administrative Hearings, 2009 Apalachee Parkway, Tallahassee, Florida, 32301 on or before November 5, 1985.

5. Pursuant to 403.508, F.S.: "(a) Parties to the proceeding shall include: the applicant; the Public Service Commission; the Division of State Planning; the water management district as defined in Chapter 373, in whose jurisdiction the proposed electrical power plant is to be located; and the Department. (b) Upon the filing with the Department of a notice of intent to be a party at least 15 days prior to the date set for the land use hearing, the following shall also be parties to the proceeding:

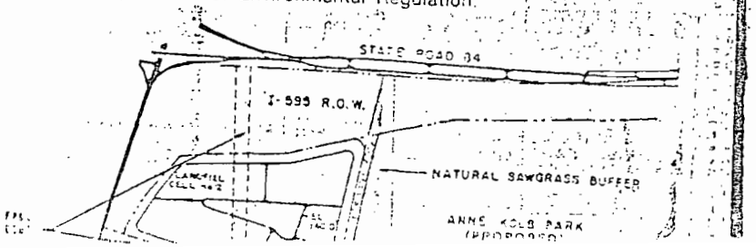
1. Any county or municipality in whose jurisdiction the proposed electrical power plant is to be located.

2. Any state agency not listed in paragraph (a) as to matters within its jurisdiction.

3. Any domestic non-profit corporation or association formed in whole or in part to promote conservation or natural beauty; to protect the environment, personal health, or other biological values; to preserve historical sites; to promote consumer interests; to represent labor, commercial or industrial groups; or to promote orderly development of the area in which

8. Those wishing to intervene in these proceedings must be represented by an attorney or other person who can be determined to be qualified to appear in administrative proceedings pursuant to Chapter 120, F.S., or Chapter 17-103.020, FAC.

9. This Public Notice is also provided in compliance with the federal Coastal Zone Management Act, as specified in 15 CFR Part 930, Subpart D. Public comments on the applicant's federal consistency certification should be directed to the Federal Consistency Coordinator, Division of Environmental Permitting, Department of Environmental Regulation.



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STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32301

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION
South Florida District Office
3301 Gun Club Road
West Palm Beach, Florida 33402

BROWARD COUNTY RESOURCE RECOVERY OFFICE
Room 521, 115 South Andrews Avenue
Fort Lauderdale, Florida 33301

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
3301 Gun Club Road
West Palm Beach, Florida 33402

BROWARD COUNTY RIVERLAND BRANCH LIBRARY
2710 West Davie Boulevard
Fort Lauderdale, Florida 33312

MAIN LIBRARY
100 South Andrews Avenue
Fort Lauderdale, Florida 33301

4. Pursuant to Section 403.508, Florida Statutes, the certification hearing ...ill be held by the Division of Administrative Hearings on November 12, 1985, at 9:30 a.m. in the Auditorium, Davie-Cooper City Library, 4600 S.W. 82nd Avenue, Davie, Florida, in order to take written or oral testimony on the ...to the consideration of the site. Need for the facility has been predetermined by the Public Service Commission at a separate hearing. Written comments may be sent to William J. Kendrick (Hearing Officer) at Division of Administrative Hearings, 2009 Apalachee Parkway, Tallahassee, Florida, 32301 on or before November 5, 1985.

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1. Any county or municipality in whose jurisdiction the proposed electrical power plant is to be located.

2. Any state agency not listed in paragraph (a) as to matters within its jurisdiction.

3. Any domestic non-profit corporation or association formed in whole or in part to promote conservation or natural beauty; to protect the environment, personal health, or other biological values; to preserve historical sites; to promote consumer interests; to represent labor, commercial or industrial groups; or to promote orderly development of the area in which the proposed electrical power plant is to be located. (c) Notwithstanding paragraph (4) (d), failure of an agency described in subparagraphs (4) (b) 1 and (4) (b) 2 to file a notice of intent to be a party within the time provided herein shall constitutes a waiver of the right of the agency to participate as a party in the proceedings. (d) Other parties may include any person, including those persons enumerated in paragraph (4) (b) who failed to timely file a notice of intent to be a party, whose substantial interests are affected and being determined by the proceeding and who timely file a motion to intervene pursuant to Chapter 120, F.S., and applicable rules. Intervention pursuant to this paragraph may be granted at the discretion of the designated hearing officer and upon such conditions as he may prescribe any time prior to 15 days before the commencement of the certification hearing. (e) Any agency whose properties or works are being affected pursuant to s.403.509 (2) shall be made a party upon the request of the department or the applicant.

6. When appropriate, any person may be given an opportunity to present oral or written communications to the designated hearing officer. If the designated hearing officer proposes to consider such communication, then all parties shall be given an opportunity to cross-examine or challenge or rebut such communications.

7. Notices of petitions made prior to the hearing should be made in writing to:

Mr. William J. Kendrick
Division of Administrative Hearings
Oakland Office Building
2009 Apalachee Parkway

8. Those wishing to intervene in these proceedings must be represented by an attorney or other person who can be determined to be qualified to appear in administrative proceedings pursuant to Chapter 120, F.S., or Chapter 17-103.020, FAC.

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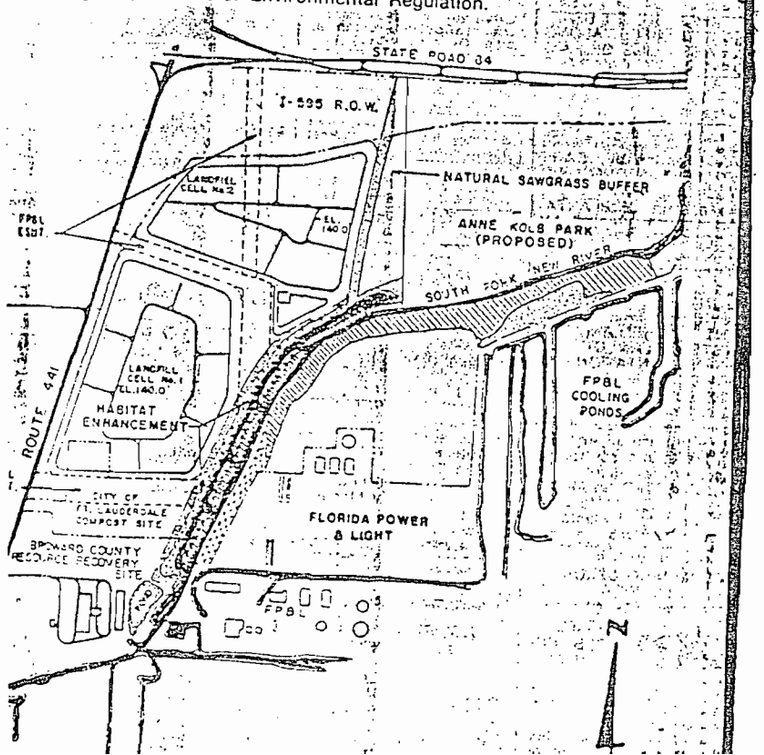

Final Determination and Permit

South Broward County Resource Recovery Facility

Broward County, Florida

PSD-FL-105

Prevention of Significant Deterioration

40 CFR 52.21

Review performed by Florida Department of Environmental Regulation

December 19, 1986

I. INTRODUCTION

Pursuant to Section 403.505, Florida Statutes, South Broward Resource Recovery Project, Inc. (County) applied to the Florida Department of Environmental Regulation (DER) in April 1985 for certification of a steam electric generating, solid waste energy recovery facility at a site near the intersection of the U.S. Route 441 and State Road 84 in Broward County, Florida. After a thorough review by DER, including public hearings, the Florida Power Plant Siting Board issued a site certification to the County. At the time, DER believed that such a site certification constituted a legal prevention of significant deterioration (PSD) permit under Chapter 17-2.500 of the Florida air pollution regulations which had been approved by the U.S. Environmental Protection Agency (EPA) on December 22, 1983. In the summer of 1985, EPA became aware that the Florida Electrical Power Plant Siting Act (PPSA) under which the site certification was issued, restricts the authority of the State of Florida to implement any regulation pertaining to power plants other than those set out in the Act. Consequently, EPA determined that the Florida PSD regulations are superceded by the PPSA, and could not legally be approved by EPA as part of the State Implementation Plan (SIP) since the PPSA does not comply in part (as to PPSA covered sources) with EPA PSD regulations both procedurally and substantively. Thus, EPA concluded that the South Broward County SWA resource recovery facility (RRF), could not be granted a valid PSD permit under PPSA.

Broward County applied to DER for a PSD permit. By that time, DER had been given authority by EPA to conduct the technical and administrative steps of the federal PSD permitting process.

The applicant plans to construct a 3300 tons per day (TPD) solid waste-to-energy facility to be located near the intersection of the U.S. Route 441 and State Road 84 in Broward County, Florida. The municipal solid waste (MSW) will be combusted to produce steam for power generation.

The present plans are to construct three 750 ton per day MSW incinerators. An ultimate maximum capacity of 3300 tons per day is anticipated in the future which will require the addition of a fourth incinerator. The applicant requests that each unit be permitted at 115% of their rated capacity.

At rated capacity each of the three energy recovery units will have an approximate heat input of 281 million Btu per hour based on a heat content of 4,500 Btu/lb for MSW. Each incinerator will be scheduled to operate 8760 hours per year and on this basis the tonnage of the various air pollutants emitted were calculated.

II. Rule Applicability

The proposed site of the South Broward County RRF is in an area designated as nonattainment for ozone under 40 CFR 81.310, and attainment for all other criteria pollutants.

New major sources which emit attainment pollutants regulated under the Clean Air Act in amounts greater than certain significance levels, are subject to 40 CFR 52.21, Prevention of Significant Deterioration (PSD). The significance levels are specified by the PSD regulations.

New major sources in Broward County which are subject to the PPSA and which are major for a nonattainment pollutant will be subject to 40 CFR 52.24, statutory restriction on new stationary sources (construction ban). New municipal incinerators capable of charging greater than 50 TPD are also subject to 40 CFR 60, Subpart E, New Source Performance Standards (NSPS).

New municipal incinerators with a charging rate equal to or greater than 50 TPD are also subject to Florida Rule 17-2.600(1)(c).

The applicant is proposing the construction of a facility capable of handling and incinerating 2588 TPD of municipal solid waste. In the future, the facility will be expanded to handle and incinerate 3300 TPD of MSW.

The average annual emissions from the unit for all regulated pollutants have been estimated by the applicant.

The proposed source has the potential to emit more than 100 tons per year of one or more regulated pollutants and is, therefore, subject to review for Prevention of Significant Deterioration (PSD) under 40 CFR 52.21. PSD review includes, among other requirements, a determination of Best Available Control Technology (BACT) and an air quality impact analysis for each attainment and noncriteria pollutant that would be emitted in a significant amount. For the proposed source, the applicant has addressed PSD review for the nine pollutants which will be emitted in significant amounts: PM, SO_2, CO, NO_x, Pb, Hg, Be, fluorides, and sulfuric acid mist.

The proposed source will emit less than 100 TPY of VOC (precursor of ozone), and is thus not subject to the construction ban of 40 CFR 52.24. The proposed incinerator will have a charging rate of 2588 tons per day, and thus is subject to NSPS and 17-2.600(1)(c). NSPS requires that the source meet a particulate emission rate of 0.08 grains per dry standard cubic foot (gr/dscf), corrected to 12% CO_2. Regulation 17-2.600(1)(c) requires each incinerator to emit no more than .08 gr/dscf particulate corrected to 50% excess air.

III. Preliminary Determination

The proposed source will result in significant emissions of the criteria pollutants PM, SO_2, CO, NO_x, and lead, and of the non-criteria pollutants beryllium, mercury, fluorides, and sulfuric acid mist.

The review required under the prevention of significant deterioration (PSD) regulations for these pollutants includes:

Compliance with all applicable SIP, NSPS, and National Emission Standards for Hazardous Pollutants (NESHAP) regulations

BACT

An analysis of existing air quality;

A PSD increment analysis (for SO_2 and PM only);

An Ambient Air Quality Standards (AAQS) analysis;

An analysis of impacts on soils, vegetation, visibility, and growth-related air quality impacts, and;

A "Good Engineering Practice" (GEP) stack height determination.

The analysis of existing air quality generally relies on preconstruction monitoring data collected in accordance with EPA-approved methods. The PSD increment and AAQS analyses depend on air quality dispersion modeling carried out in accordance with EPA guidelines. BACT is specified on a case-by-case basis considering environmental, economic, and energy impacts.

Based on these required analyses, the Department has reasonable assurance that the proposed units at the South Broward County RRF, as described in this report and subject to the conditions of approval proposed herein, will employ BACT, will not cause or contribute to a violation of any PSD increment or ambient air quality standard, and will comply with all appplicable air pollution regulations. A discussion of all review components follows.

IV. Control Technology Review

a. BACT Determination

40 CFR 52.21 (j) requires that each pollutant subject to PSD review must be controlled by BACT. Nine pollutants are subject

to BACT. The BACT emission limits proposed by the Department are summarized as follows:

Pollutant	BACT
Particulate Matter	0.015 gr/dscf, corrected to 12% CO_2
Sulfur Dioxide	2.8 lb/ton
Nitrogen Oxides	5.0 lb/ton
Carbon Monoxide	0.8 lb/ton
Lead	0.009 lb/ton*
Mercury	2300 grams/day*
Beryllium	8.4×10^{-6} lb/ton
Fluorides	0.016 lb/ton*
Sulfuric Acid Mist	7.7×10^{-3} lb/ton*

*These emission limitations are based on the determination that BACT is a scrubber and high efficiency particulate control (0.015 gr/dscf, corrected to 12% CO_2). The emission limit for mercury is for each unit.

Also included as proposed permit conditions are limits on opacity, and VOC. These limits are required to insure the emissions of VOC do not exceed the threshold level for applicability of the construction ban.

The applicant plans to construct a 3300 ton per day (TPD) solid waste-to-energy facility to be located near the intersection of the U.S. Route 441 and State Road 84 in Broward County, Florida. The municipal solid waste (MSW) will be combusted to produce steam for power generation.

The present plans are to construct a 2250 ton per day MSW processing facility and later add an additional 1050 TPD capacity. The initial ultimate plant capacity is 2588 TPD MSW 115% of rated capacity. The applicant desires to permit the facility at this ultimate capacity.

Each of the three energy recovery units will have an approximate maximum heat input of 281 million Btu per hour based on a heat content of 4,500 Btu/lb for RDF. Each incinerator will be scheduled to operate 8760 hours per year and on this basis the tonnage of the various air pollutants emitted were calculated.

Based upon air pollutant emission factors provided by the applicant, the calculated total annual tonnage of regulated air pollutants emitted from the units to the atmosphere is listed as follows:

Pollutant		Maximum Annual Emissions (tons/Year)	PSD Significant Emissions Rate (tons/year)
Particulate	(PM)	328	25
Sulfur Dioxide	(SO_2)	2319	40
Nitrogen Dioxide	(NO)	2361	40
Carbon Monoxide	(CO)	378	100
Ozone	(O_3)	57 (VOC)	40
Lead	(Pb)	128	0.6
Mercury	(Hg)	3.9	0.1
Beryllium	(Be)	0.0040	0.0004
Fluorides	(F)	109	3
Sulfuric Acid Mist	(H_2SO_4)	200	7

BACT Determination Requested by the Applicant:

The following emission limits are based upon a unit ton of MSW charged.

PM -	0.67 lbs	CO -	0.80 lbs	Hg -	0.0083 lbs
SO_2 -	4.95 lbs	Pb -	0.027 lbs	F -	0.16 lbs
NOx -	5.00 lbs	Be -	8.4×10^{-6}	VOC -	0.12 lbs

An electrostatic precipitator (ESP) will be used to control the particulate, Pb, Hg, and Be emissions. Design and operating procedures will control the emission of VOC, CO and NO_x. The firing of only RDF, a low sulfur content fuel, will limit SO_2.

Each MSW incinerator will have a charging rate more than 50 tons per day, and therefore, is subject to the provisions of 40 CFR 60.50, Subpart E, New Source Performance Standards (NSPS). The NSPS standard regulates only particulate matter. The particulate matter standard is 0.08 grains/dscf, corrected to 12% CO_2. This NSPS was promulgated in 1971 and no longer reflects state-of-the-art for control of particulate emissions. Recent stack testing data for MSW incinerators indicates that both electrostatic precipitator and fabric filter control technology are capable of controlling particulate emissions well below the applicant's proposal of 0.03 grains/dscf. Based on the control technology available a particulate matter emission limit

of 0.015 grains/dscf corrected to 12% CO_2 is judged to represent BACT. All the other requirements as set forth in the NSPS, Subpart E, will apply.

The Department has determined the emission limit for SO_2 to be 2.8 pounds per ton of MSW charged into the incinerator. MSW components that appear to be major contributors of sulfur include rubber, plastics, leather, paper, and paper products.

The SO_2 emission limit was determined to be BACT by evaluating limits set for similar facilities in Florida and other states, determinations which have indicated that an emission limit of 2.8 pounds per ton of MSW charged is reasonable based on the heat content of the fuel. The amount of SO_2 emitted would be comparable to the burning of distillate oil having less than a 0.5% sulfur content. Burning low sulfur fuel is one acceptable method of controlling SO_2 emissions. The installation of a flue gas desulfurization system to control SO_2 emissions alone is not warranted when burning MSW.

The emission limit determined as BACT for mercury is equal to the National Emission for Hazardous Air Pollutants (NESHAPs), 40 CFR 61.50, Subpart E. The BACT is determined to be 2300 grams per day for each unit. This level of mercury emissions is judged to be reasonable based on test data from similar facilities and the degree of control that will be provided by the acid gas and particulate control equipment which have been determined to be BACT for this facility.

This level of mercury emissions is not considered to have a major impact on the environment.

The uncontrolled emission of beryllium, according to the California report, when firing MSW is estimated to be 6.2×10^{-6} pounds per million Btu. Uncontrolled beryllium emissions would be approximately 11 grams per 24 hours or 0.01 TPY. The operating temperature of the particulate matter emission control device will be below 500°F. Operation below this temperature is necessary to force adsorption/condensation of beryllium oxides, present in the flue gas stream onto available fly ash particles for subsequent removal by the particulate control device. The annual beryllium emissions are estimated at 0.0007 tons per year. This amount of beryllium emitted is considered to have a negligible impact on the environment. The emission factor of 8.4×10^{-6} lb/ton MSW proposed by the applicant is judged to be BACT. If, however, beryllium containing waste as defined in the National Emission Standards for Hazardous Air Pollutants (NESHAPs), Subpart C, Subsection 61.31(g), is charged into the incinerator, emissions of beryllium to the atmosphere shall not exceed 10 grams per 24 hours or an ambient concentration of 0.01

ug/m^3, 30 day average. Compliance with this beryllium emission limit will be in accordance with the NESHAPs, Subpart C.

The applicant has projected abated lead and fluoride(s) emissions to be 128 and 109 tons per year respectively. Projected sulfuric acid mist emissions are as high as 200 tons per year. These amounts are well in excess of the significant emission rates given in Florida Administrative Code Rule 17-2.500, Table 500-2.

With respect to lead emissions, two conditions are needed to achieve high removal efficiencies of metallic compounds emitted at refuse burning facilities: (1) operation of particulate matter control equipment at temperatures below 260°C (500°F), and (2) consistently efficient removal of submicron fly ash particles. The maximum temperature of the incinerator combustion gases at the inlet to the particulate control device is estimated to be 475°F. At this temperature the particulate control equipment would be capable of removing the lead emissions from the flue gas stream.

When flue gas temperatures are lowered below 260°C (500°F), metallic compounds are removed from the vapor phase by adsorption and condensation preferentially on fine particles with submicron particles receiving the highest concentrations of metals. Properly designed and operational fabric filter systems appear at this time to offer the best method for consistent and efficient removal of fine (and in particular submicron) fly ash. Removal efficiencies of fine fly ash using these systems can be in excess of 99% with respect to MSW incinerators. Studies have indicated the weight percent of submicron particles emitted from combustion is on the order of 45% which clearly indicates the need for efficient control of particles in this range.

The emission limit judged to be reasonable for lead is based on test results similar facilities and the degree of emission control that will be provided by the control equipment which has been determined to be BACT for this facility. In accordance with data contained in the California Air Resources Board (CARB) report on resource recovery facilities, the highest uncontrolled lead emission rate from refuse-fired incinerators tested is 16,000 ug/MJ. Based on a heating value of 4,500 Btu per pound of refuse and the control efficiency reported for lead emissions using the required BACT (scrubber and particulate control of 0.015 gr/dscf, corrected to 12% CO_2) and emission limitation of 0.009 lbs per ton of refuse charged is judged to be reasonable as BACT for lead emissions. Recent testing of a similar facility (Westchester, NY) indicates that for the average of 14 runs, lead emissions represented 1.4% of particulate emitted. This emission level is consistent with the BACT determination when the allowable particulate emission limit is taken into consideration.

Emissions of fluoride originate from a number of sources in the refuse. The mechanisms of governing fluoride release and formation of hydrogen fluoride at refuse-burning facilities are probably similar to those for hydrogen chloride. The control of fluorides can be reduced at refuse-burning plants by removal of selected refuse components with high fluoride contents, and the use of flue gas control equipment. In view of the fact that it is proposed to incinerate materials that contain fluoride, BACT for the control of fluorides is installation of a flue gas scrubber system. The addition of a scrubber system would also provide control for SO_2 emissions addressed earlier in this analysis as well as other acid gases which will be addressed in other sections of the analysis. Once again, the emission limit has been based on test results from similar facilities and the control equipment required for this facility.

During combustion of municipal solid waste, NO_x is formed in high temperature zones in and around the furnace flame by the oxidation of atmospheric nitrogen and nitrogen in the waste. The two primary variables that affect the formation of NO_x are the temperature and the concentration of oxygen. Techniques such as the method of fuel firing to provide correct distribution of combustion air between overfire and underfire air, exhaust gas recirculation, and decreased heat release rates have been used to reduce NO_x emission. A few add-on control techniques such as catalytic reduction with ammonia and thermal de-NO_x are still experimental and are not considered to be demonstrated technology for the proposed project. State-of-the-art control of the combustion variables wil be used to limit NO_x emissions at 5.0 pounds per ton charged. This level of control is judged to represent BACT.

Carbon monoxide is a product of incomplete combustion where there is insufficient air. Incomplete combustion will also result in the emissions of solid carbon particulates in the form of smoke or soot and unburned and/or partially oxidized hydrocarbons. Incomplete combustion results in the loss of heat energy to the boiler. The applicant proposes that good equipment design and practice plus continuous CO monitors are BACT for carbon monoxide. The department feels that an emission limit for carbon monoxide which would correspond to optimum combustion is needed. Based on technical information relating good combustion practices for the control of dioxin emissions and BACT determinations from other states, a limit of 0.8 pounds per ton of MSW charged is judged to represent BACT for carbon monoxide emissions.

Furthermore, CO has a calorific value of 4347 Btu/lb and when discharged to the atmosphere represents lost heat energy. Since heat energy is used to produce the steam which drives the generator to produce electric power, there is a strong economic incentive to minimize CO emissions.

Hydrocarbon emissions, like carbon monoxide emissions, result from incomplete oxidation of carbon compounds. Control of CO and HC emissions can be mutually supportive events. BACT for hydrocarbons is good combustion practices which correspond to the carbon monoxide limitation above.

Sulfur dioxide produced by combustion of sulfur containing materials can be oxidized to SO_3 which can then combine with water vapor to produce sulfuric acid mist. The applicant has estimated sulfuric acid mist emissions could be as high as 200 tons per year. This facility, thus, has the potential to be major for sulfuric acid mist and additional control is warranted. Flue gas scrubbers have demonstrated 90+% control of sulfuric acid mist emissions and are considered to be BACT for this proposed facility. As was the case with fluoride, the emission limit has been based on test results and the degree of control expected from the scrubber.

The type of air pollutants emitted when incinerating plastics depends on the atomic composition of the polymer. Plastics composed of only carbon and hydrogen or carbon, hydrogen and oxygen form carbon dioxide and water when completely combusted. Incomplete combustion yields carbon monoxide as the major pollutant.

Plastics containing nitrogen as a heteroatom yield molecular nitrogen, some NO_x, carbon dioxide, and water when completely combusted. Complete combustion of plastics containing halogen or sulfur heteroatoms form acid gases such as hydrogen chloride, hyrdogen fluoride, sulfur dioxide, carbon dioxide, and water. Halogen or sulfur compounds can form from incomplete combustion of the plastic. Polyvinyl chloride (PVC), one of the many polymers, has been implicated as causing the most serious disposal problem due to the release of hydrogen chloride (HCl) gas when incinerated. This problem has long been realized resulting in other polymers being used in packaging. For example, the weight percent of chlorine in polyurethane is 2.4, with only trace amounts in polyethylene and polystyrene, as compare to the weight percent of 45.3 in PVC.

A recent study of MSW incineration performed for the USEPA has indicated that the plastics content of refuse is expected to grow by from 300-400% from the year 1968 to 2000. This increase can be expected to increase uncontrolled HCl emissions from municipal waste incineration by roughly 400% from 1970 to the year 2000. Potential emissions of stated HCl from the incinerator are estimated to be as high as 5252 tons per year based on an emission factor of 11.12 lbs per ton of MSW incinerated.

Emissions of HCl at refuse incineration facilities can be reduced by removal of selected refuse components with high

chlorine contents (source separation), combustion modification, and the use of flue gas control equipment. Although the combustor configuration may influence the amount of chlorine conversion, combustion modification is not a viable means of controlling HCl emissions.

Potential emissions of HCl can be reduced significantly by removing plastic items from the waste stream. This is particularly true when the plastics are the PVC type explained earlier. With the exception of limited recycling efforts, source separation of plastics has not been demonstrated and costs are uncertain at this time. In addition to this, the combustion of plastics may be favorable due to their relatively high heat of combustion.

Plastic materials have a high heat of combustion, for example, coated milk cartons - 11,300 Btu/lb, latex - 10,000 Btu/lb and polyethylene 20,000 Btu/lb. For comparison, newspaper and wood have a heat content of 8,000 Btu/lb, and kerosene 18,900 Btu/lb. Here again there is economic incentive to obtain as complete combustion as possible.

At this time flue gas controls are the most conventional means of reducing HCl emissions at refuse burning facilities. Based on the estimates of HCl emissions and the trend for increases due to higher percentages of plastics in future waste streams, the installation of a scrubber to control the acid gases would provide an added benefit of controlling HCl emissions.

An analysis of a proposal to construct a MSW incinerator in 1986 would not be complete unless the subject of dioxins was addressed.

Dioxin is a hazardous material that has received widespread public concern. It is found in trace amounts whenever substances containing chlorine (for example, plant and animal tissues and plastics) are burned. It is also an impurity that can be found in some herbicides, such as "2,4,5-T".

The applicant has stated that flue gas temperatures in excess of 1600°F (measured at the furnace outlet) result in greater than 99.99% destruction of dioxin. It has been proposed that the furnace will achieve gas temperatures in the radiant section of the furnace of approximately 2200°F. This temperatures combined with an exposure of at least two seconds is proposed as an effective control for dioxins.

Although the subject of dioxin is new, and relatively little is known, two important things stand out: 1) dioxin is readily minimized in properly designed and operated BACT-equipped facilities, and 2) very small amounts cause demonstrable health effects in experimental animals. Although most of the reduction

in dioxin emissions is believed to take place in the combustion chamber, the installation of acid gas control and a high efficiency particulate control device (grain loading not to exceed 0.015 gr/dscf) has been reported to provide an additional control strategy to remove dioxins from the flue gases based on the assumption which is thought by many that dioxins can be adsorbed on the surface of particulate matter. Thus, the greater the TSP collection, especially submicron particles, the better the dioxin control.

Throughout this BACT determination much emphasis has been placed on the controls that are needed to satisfy the BACT requirements. Although the department does not have the authority to stipulate the type of control equipment that should be used on a facility (i.e., ESP vs. baghouse; dry vs. wet scrubber), a dry scrubber used in conjunction with fine particulate control appears to be the best method for controlling emissions from this type of facility.

Electrostatic precipitators (ESP's) without acid gas control remove total suspended particulates (TSP) only, collecting submicron particles with difficulty. Submicron particle collection can be done, but as with any control, effectiveness and reliability are questionable in this area. The justification for acid gas controls is clearly demonstrated in this analysis and test data show fabric filters to be less sensitive to changes in flue gas volumes, inlet concentrations, in particle resistivity than ESP's which have been historically employed at most refuse burning facilities.

The recommendation that a dry scrubber baghouse combination should be used as the control strategy for the resource recovery facility is not warranted if the economic costs of installing and operating the recommended control technology outweigh the benefits of controlling the pollutants that would be controlled by the equipment.

The applicant has stated that systems which would control SO_2 with 70 percent efficiency would result in costs which equate to 4.6 to 6.5 million (1983) dollars, based a scrubber availability factor of 90%.

A review of economic analyses performed for several proposed resource recovery facilities indicates that the highest cost of adding acid gas control was $4.37 (1984 dollars) per ton of MSW incinerated. This cost included amortized capital cost and annual operating cost. Equating this value to operating the proposed facility (2,250 tons per day) results in an annualized cost of approximately 3.6 million dollars. It should be noted that an accurate comparison of projected costs can only be determined by equating the amortization periods and including site specific costs for the various facilities. In any case the

figures supplied by the applicant appear to the questionable and additional study is required to clearly define and support the applicant's cost analysis.

Assuming that the applicant's upper range figure of 6.5 million dollars of control is justified, an analysis of the costs required to control tonnage of pollutants removed is required.

A scrubber with a SO_2 removal efficiency of 70% would most likely be capable of controlling acid gas emissions with an efficiency of 90%. The applicant has indicated that approximately 730,000 tons per year of MSW will actually be processed by the 2,250 TPD facility. Based on the cost of per ton of controlling SO_2 and HCl* (assuming a conservatively low estimate of 6.0 pounds of HCl emitted per ton of refuse charged) the installation and operation of a scrubber unit would be $2,015 which is consistent when compared to costs of up to $2,000 per ton which are considered reasonable in developing EPA New Source Performance Standards. Again, it should be noted that this estimated was based on the cost provided by the applicant which attributed a cost increase of using acid gas control due to a scrubber availability factor of 90%. In accordance with other information (see testimony of Waler R. Niessen, page 13; Babylon Resource Recovery Facility) the use of a dry scrubber does not significantly reduce plant availibility. This would imply that the applicant's projection of 6.5 million ($8.9 per ton of MSW processed) to control acid gases on an annualized basis is unreasonably high and the actual cost should be closer to the other cost estimates provided by this discussion. In addition, to the high cost estimate supplied by the applicant, the amount of HCl emissions per ton of MSW charged is expected to be much greater than 6 pound per ton when the facility goes into operation thus further decreasing the cost per ton of acid gases controlled. The costs projected for adding acid gas scrubbers for other projected resource recovery facilities and the South Broward facility are given in the following paragraphs.

Previous analyses completed for similar facilities have indicated that the cost of using the scrubber-baghouse combination was not unreasonable compared to using an electrostatic precipitator alone. At rated capacity, a unit proposed for installation in the state of Connecticut showed that the cost of using the scrubber-baghouse combination and the precipitator alone were $3.36 and $1.83 respectively per ton of refuse charged. This comparison indicates the costs per ton of pollutant removed using the scrubber-baghouse combination are indeed reasonable when compared to the costs of using an an electrostatic precipitator alone. This slight differential in cost can be attributed to the following:

1) a scrubber cools the gases and reduces their volume which reduces the size requirement (cost) of the particulate control

device, and 2) a dry scrubber is mechanically a simple device and capable of off-site fabrication.

Based on the scrubber's ability to control SO_2, HCl*, and other acid gas emissions, and the size of the projected resource recovery facility (the cost to control emissions on a per ton of MSW charged decreases as the size of the facility increases), the department feels that the cost of adding a flue gas scrubber to the precipitator or using the dry scrubber-baghouse combination is not unreasonable for this facility. The added cost of purchasing scrubbers according to general equipment vendors, designers and contractors is typically in the range of 2 to 5 percent of the total cost for the project, and would be offset by the immediate economic and environmental benefits realized by the installation. The actual cost of using the dry scrubber-baghouse combination was well presented in the recent hearing of the South Broward County Solid Waste Energy Resource Facility.

During testimony at the South Broward hearing, Dr. Aaron Teller, President of Teller Environmental Systems, guaranteed that his company could provide acid gas and particulate control using dry scrubbing and fabric filter technology for $6.00 per ton of municipal solid waste incinerated. This cost would utilize equipment that is capable of reducing, SO_2 emissions by 70%, HCl by 90%, HF by 95%, heavy metals by 99%, and controlling particulate emissions to 0.01 grains/dscf, corrected to 12% CO_2. These control efficiencies are much more stringent than those proposed by the applicant, yet the guaranteed cost of providing the high efficiency control for <u>both particulates and acid gases</u> is equal to the cost provided by the applicant for acid gas control alone. In addition, other states such as Connecticut are seeing that actual tipping fees have increased much less than expected when the dry scrubber-baghouse combination was imposed instead of using an ESP only for controlling emissions from resource recovery facilities.

At a recent conference held in Washington D.C., entitled "Acid Gas and Dioxin Control For Waste-to-Energy Facilities", a topic of great concern was the methods in which emissions from resource recovery facilities should be controlled. The general consensus of the conference speakers (including EPA) is that resource recovery facilities are best controlled with a dry scrubber-baghouse combination.

Based on the scrubber's ability to control SO_2, HCl*, and other acid gas emissions, and the size of the projected resource recovery facility (the cost to control emissions on a per ton of refuse charged decreases as the size of the facility increases), the department feels that the cost of adding a flue gas scrubber to the precipitator or using the dry scrubber-baghouse combination is not unreasonable for this facility. Assuming a realistic

figure of 290,000 households being served by the facility when construction begins and Dr. Teller's cost estimate, the cost of total particulate and acid gas control would amount to $1.36 per month per household with approximately half of the cost going to acid gas control and the other half to particulate control. In view that the actual number of households will be greater when the facility actually goes on line and it is known that businesses and industry will also generate refuse and share the cost, the actual cost per household is expected to be even less.

(* Hydrochloric acid [HCl], though not listed as a regulated pollutant for MSW incinerators, is intensely corrosive and should be included in the economic analysis when justifying the addition of flue gas scrubbing equipment. The EPA is currently requiring hazardous waste incinerators emitting more than four (4) pounds of HCl per hour achieve removal efficiency of up to 99%. A minimum of 99% removal efficiency is required when removal at this efficiency will not reduce emissions to four pounds per hour.)

b. NSPS and Florida SIP Limit Analysis

These two regulations dictate similar emission limits using slightly different units. The proposed particulate emission limit of 0.015 gr/dscf is far below either of these limits.

V. Air Quality Analysis

The air quality impact of the proposed emissions has been analyzed. Atmospheric dispersion modeling has been completed and used in conjuction with an analysis of existing air quality data to determine maximum ground-level ambient concentrations of the pollutants subject to BACT. Based on these anlayses, the department has reasonable assurance that the proposed solid waste recovery facility in South Broward County, subject to these BACT emission limitations, will not cause or contribute to a violation of any PSD increment or ambient air quality standard.

a. Modeling Methodology

The EPA-approved Industrial Source Complex Short-Term (ISCST) dispersion model was used in the air quality impact analysis. This model determines ground-level concentrations of inert gases or small particules emitted into the atmosphere by point, area, and volume sources. The model incorporates elements for plume rise, transport by the mean wind, gaussian dispersion, and pollutant removal mechanisms such as deposition or transformation. The ISCST model also allows for the separation of sources, building wake downwash, and various other input and output features. Both screening and refined analyses were completed using this model.

The applicant completed the dispersion modeling for two scenarios. The first scenario dealt with the initial capacity of the proposed facility and the second scenario with a predicted ultimate capacity. The initial capacity of the facility was estimated at 2705 tons per day (TPD) of municipal solid waste (MSW). This capacity was estimated because the actual incinerator size had not been determined. The ultimate capacity of the facility was estimated at 3795 TPD of MSW; however, there are currently no plans for the construction of additional incinerators to bring the capacity up to this level. Since the submission of the modeling results, the applicant has decided to initially construct three 750 TPD incinerators. Allowing for these units to run at up to 15% above nameplate capacity (this same allowance was made in the original estimate of 2705 TPD), the initial capacity is now estimated as 2588 TPD.

In addition to estimating the capacity of the facility, the applicant also estimated the emission rates of the regulated pollutants. These estimates were based on test results from other facilities and from their proposed best available control technology (BACT) analysis. The department has reviewed the applicant's BACT analysis and has in some cases determined a different emission limitation for a pollutant. For the purpose of this review the initial capacity, as currently anticipated (2588 TPD), and the emission limitations as determined by the department will be used to develop the ambient impacts. It is assumed that the emission characteristics, i.e., the stack height, stack gas temperatures, exit velocity, and stack diameter, are the same for the new capacity and BACT emision rates, although these could change if a different control device is required to meet these limitations.

Five years of sequential hourly meteorological data were used in the modeling analyses. Both the surface and the upper air data used were National Weather Service data collected at Miami, Florida, during the period 1970-1974. Since five years of data were used, the highest, second-high, short-term predicted concentrations are compared with the appropriate ambient standard or PSD increment.

The initial set of screening model runs determined the highest, second-high concentrations, over a polar coordinate receptor grid with 36 radials, 10 degrees apart, and 10 downwind distances from 0.3 km to 4.3 km. Concentrations were predicted for the initial capacity fo the facility. Additional refined modeling was completed for those days having the highest, second-high concentrations using a refined receptor grid of sevel radials, 2 degrees apart and seven distances, 100 m apart, centered on the location of the previously determined high, second-high value. In all of these runs only the proposed RRF was modeled. Other major sources in the area, namely Florida

Power and Light's Port Everglades and Ft. Lauderdale facilities, were additionally modeled by the applicant.

The impact of the proposed facility on the Everglades National Park Class I area was also evaluated. Modeling was completed placing receptors along the edge of the Class I area using five years of meteorological data. The 17 receptor locations were spaced two kilometers apart along the northeast boundary of the park.

All of the modeling was completed using the SO_2 emission rate of the proposed facility. The impacts of the other emitted pollutants were determined by ratioing the emission rates to the SO_2 emission rate and multiplying by the SO_2 impact. Total ambient air quality impacts were based on the modeled impacts plus the monitored "background" concentrations.

The stack parameters and emission rates used in evaluating the ambient impacts are listed in Table V-1 and Table V-2, respectively.

b. Analysis of Existing Air Quality

Preconstruction ambient air quality monitoring is required for all pollutants subject to PSD review. In general, one year of quality assured data using an EPA reference, or the equivalent monitor must be submitted. Sometimes less than one year of data, but not less than four months, may be accepted when department approval is given.

An exemption to the monitoring requirement can be obtained if the maximum air quality impact, as determined through air quality modeling, is less than a pollutant-specific deminimus concentration. In addition, if current monitoring data already exist and these data are representative of the proposed source area, then at the discretion of the department these data may be used.

The predicted maximum air quality impacts of the proposed facility for those pollutants subject to PSD review are given in Table V-3. The monitoring demininus level for each pollutant is also listed. Sulfuric acid mist and arsenic are not listed because there is no deminimus level for either of these pollutants. All pollutants have maximum predicted impacts below their respective deminimus values. Therefore, specific preconstruction monitoring is not required for any pollutant.

Table V-4 lists the measured ambient concentrations of all pollutants being currently monitored within 10 kilometers of the proposed facility. These values are used to estimate current background levels.

Table V-1

Broward County Resource Recovery Facility
Source Parameters

Source (1)	UTM - E (km)	UTM - N (km)	Stack Height (M)	Exit Temp. (K)	Exit Velocity (M)	Stack Diameter (M)
Unit 1	579.6	2883.3	59.4	505	26.4 (2)	2.29
Unit 2	579.6	2883.3	59.4	505	26.4 (2)	2.29
Unit 3	579.6	2883.3	59.4	505	26.4 (2)	2.29

(1) Three 750 TPD incinerators, each with a flue to a common stack. For modeling purposes the common stack was given a stack diameter of 5.03 m and an exit velocity of 14.1 m/s, providing for a minimum flow rate.

(2) Estimated by dividing flow rate (ACFM) in application by 3 and calculating with given diameters.

Table V-2
Broward County Resource Recovery Facility
Maximum Emission Rates (1)

Polluatant	(lb/ton)	(lb/hr)	(ton/yr)
PM	0.34	37.5	164
SO_2	2.8/5.6(2)	603.9	1322
NOx	5.0	539.2	2361
CO	0.8	86.3	378
VOC	0.12	12.9	57
Pb	0.014	1.5	6
F^-	0.023	2.5	11
H_2SO_4 Mist	0.042	4.6	20
Be	8.4×10^{-6}	0.00091	0.0040
Hg	0.0027	0.29	1.3
As	0.00028	0.030	0.13
HCl	1.11	120	525

(1) Based on facility capacity of 2588 TPD of MSW and department emission limitations.

(2) The emission limitation is 2.8 lb/ton 30 day average, not to exceed 5.6 lb/ton.

Table V-3
Broward County Resource Recovery Facility
Maximum Air Quality Impacts of the RRF
For Comparsion to the Deminumus Ambient Levels

Polluatant and Averaging Time	Predicted Impact (ug/m^3)	Deminimus Ambient Impact Level(ug/m^3)
SO_2 (24-hour)	7.4	13
PM (24-hour)	0.5	10
NO_2 (Annual)	0.7	14
CO (8-hour)	2.1	575
Pb (24-hour)	0.02	0.1
F^- (24-hour)	0.030	0.25
Be (24-hour)	0.00001	0.0005
Hg (24-hour)	0.004	0.025

Table V-4
Broward County Resource Recovery Facility
Monitoring Data Within 10 km of the RRF

Site	(Location with Respect to the Proposed Facility) Direction (degrees)	Distance (km)	Pollutant	Concentration 1984 Annual ($\mu g/m^3$)	24-hour ($\mu g/m^3$)	8-hour (mg/m^3)	1-hour (mg/m^3)
0420002	3°	2.0	CO			10	17
0910002	296°	3.8	PM	33	64		
			NO_2	28			
			SO_2	3	4		
1260004	55°	6.8	PM	41	72		
			NO_2	29			
			SO_2	4	28		
1840001	158°	6.9	PM	39	70		
			Pb (quarterly)	0.2			
3530001	216°	7.3	NO_2	30			
			SO_2	3	6		
1260003	27°	7.6	PM	59	93		
			NO_2	42			
			SO_2	3	4		
			CO			7	11
			Pb (quarterly)	0.9			
1840002	150°	8.6	CO			6	10
3640002	334°	9.4	PM	31	59		

The PSD increments represent the amount that new sources may increase ambient ground-level concentrations of SO_2 and PM. At no time, however, can the increased emissions of these pollutants cause or contribute to a violation of the ambient air quality standards.

c. PSD Increment Analysis

The proposed Broward County RRF is to be located in a Class II area. This area is also designated as an attainment area for both SO_2 and PM. A PSD increment analysis is therefore required to show compliance with the Class II increments.

The PSD increments represent the amount that new sources in the area may increase ambient ground-level concentrations of SO_2 and PM. At no time, however, can the increased loading of these pollutants cause or contribute to a violation of the ambient air quality standards.

All SO_2 and PM emission increases from sources constructed or modified after the baseline date (December 1977) will consume PSD increment. In addition, all SO_2 and PM emission increases associated with construction or modification of major sources which occurred after January 6, 1975, will consume increment. The proposed Broward County RRF is the only significant source in the area which will consume PSD increment for either SO_2 or PM.

Atmospheric dispersion modeling, as previously described, was performed to quantify the amount of PSD increment consumed. The results of this modeling are summarized in Table V-5. The results indicate that the concentration increases are within the allowable amounts.

A Class I area increment analysis is required because the proposed facility is located within 100 kilometers (57 km) of the Everglades National Park, a designated Class I area. Although the distance to the Class I area is greater than 50 kilometers (the distance to which the models are generally considered valid), the applicant used the model to estimate the impact on this area. The results indicate a less than significant impact.

d. AAQS Analysis

Given existing air quality in the area of the proposed facility, emissions from the new facility are not expected to cause or contribute to a violation of an AAQS. Table V-6 shows the results of the AAQS analysis.

The results showed that, with the exception of SO_2 and lead, the maximum impacts of the other criteria pollutants were less than the significant impact levels defined in Rule 17-2.100(150), FAC. As such, no further modeling analysis was completed for PM,

Table V-5
Broward County Resource Recovery Facility
Comparison of New Source Impacts with PSD Increments

Pollutant and Averaging Time	PSD Class II Increment ($\mu g/m^3$)	Predicted Increased Concentration ($\mu g/m^3$)	Percent Increment Consumed	PSD Class I Increment ($\mu g/m^3$)	Predicted Increased Concentration ($\mu g/m^3$)
SO_2					
3-hour	512	26	5	25	4
24-hour	91	7	8	5	1
Annual	20	<1	<5	2	<1
PM					
24-hour	37	<1	<3	10	<1
Annual	19	<<1	<<5	5	<<1

Table V-6
Broward County Resource Recovery Facility
Comparsion of Total Impact with the AAQS

Pollutant and Averaging Time	Maximum Impact Project (ug/m^3)	Maximum Impact (1) All Sources (ug/m^3)	Existing Background (2) (ug/m^3)	Maximum Total Impact (ug/m^3)	Florida AAQS (ug/m^3)
SO_2					
3-hour	26	625	63 (3)	688	1300
24-hour	7	216	28	244	260
Annual	<1 (4)	-	4	-	60
PM					
24-hour	<1 (4)	-	93	-	150
Annual	<<1 (4)	-	59	-	60
NO_2					
Annual	<1 (4)	-	42	-	60
CO					
1-hour	4 (4)	-	17,000	-	40,000
8-hour	2 (4)	-	10,000	-	10,000
Pb					
3-months	<0.1	-	0.9	1	1.5

(1) Maximum impact includes the FPL Port Everglades and Fort Lauderdale power plants.

(2) Existing background is estimated using the highest monitored concentrations in the area near the proposed

(3) The 3-hour background is estimated by multiplying the 24-hour background by 2.25.

(4) Less than significant, no further analysis completed.

NOx, and CO. For SO_2, additional modeling was performed which included the interaction of surrounding sources of SO_2. For lead, there is no significant impact level defined in the Rule. No further modeling of lead was completed because the predeominate source of ambient lead in the area is mobile sources.

The total impact on ambient air is obtained by adding a "background" concentration to the maximum modeled concentration. This "background" concentration takes in to account all sources of the particular pollutant in question that were not explicitly modeled. A conservative estimate of these "background" concentrations is given by the second highest monitored concentration for each pollutant as listed in Table V-4. This is a conservative estimate because sources used in the modeling may have contributed to the monitored value and contribute doubly to the total impact.

Based on this analysis, the department has reasonable assurance that no AAQS will be exceeded as a result of the operation of the proposed new resource recovery facility.

VI. Additional Impacts Analysis

a. Impacts on Soils and Vegetation

The maximum ground-level concentrations predicted to occur as a result of emissions from the proposed project in conjunction with all other sources, including a background concentrations, will be at or below all applicable AAQS including the secondary standards designed to protect public welfare-related values. As such, these pollutants are not expected to have a harmful impact on soils and vegetation.

A summary of the types and quantities of soils and vegetation in and around the proposed RRF site area and in the Everglades National Park can be found in the Site Certification Application. The applicant has also compared predicted maximum impacts with known adverse impact levels for both criteria and noncriteria pollutants. No adverse impacts are expected.

b. Impact on Visibility

A level I visibility screening analysis was performed to determine if any impact may occur in the Class I area. The analysis showed that there was no potential for an adverse impact on visibility in this area.

c. Growth-Related Air Quality Impacts

The proposed facility is not expected to significantly change employment, population, housing, or commercial/industrial

development in the area to the extent that a significant air quality impact will result.

d. GEP Stack Height Determination

Good Engineering Practice (GEP) Stack height is defined as the greater of: (1) 65 meters or (2) the maximum nearby building height plus 1.5 times the building height or width, which ever is less. For the proposed project, a single common stack, housing the individual flues for each incinerator, will be 61.0 meters high. This is below the allowed GEP stack height of 65 meters.

e. Noncriteria Pollutants

The proposed facility emits in significant amounts (as defined in the PSD regulations): fluorides, sulfuric acid mist, beryllium, mercury, and arsenic. All of these pollutants are regulated, but, there is no ambient air quality standards or PSD increments set for any of them. For three of these polluants, fluorides, beryllium, and mercury, a deminimus ambient impact level has been defined. Exceedance of these levels, usually determined by dispersion modeling, is used to determine if ambient monitoring is necessary. The results of this modeling for these pollutants is listed in Table V-3. For each of these three pollutants, the predicted impact is less than their respective deminimus impact level.

f. Unregulated Pollutants

Two additional pollutants are often brought up in the context of resource recovery facilities. These are hydrogen chloride (HCl) and dioxins (2, 3, 7, 8-TCDD). Neither is currently regulated within the PSD regulations. Hydrogen chloride is regulated nationally for other type sources but not specifically for resource recovery facilities. Some states do regulate both of these substances. Both of these substances may become regulated either nationally or by the state in the future. The recommended control equipment necessary for the facility to meet the BACT emissions limitations for the regulated pollutants will also control HCl and dioxins.

Hydrogen chloride is not a regulated pollutant. However, because emissions of this pollutant are known to be relatively high, the applicant was asked to estimate these emissions. Uncontrolled, the emissions of hydrogen chlorides are on the same order as sulfur dioxide and nitrogen oxides. Emissions will likely be reduced due to controls being required for fluroides and sulfuric acid mist.

VII. Nonattainment Review

EPA announced approval of Florida's new source review program for major sources in designated nonattainment areas on March 18, 1980 (45 FR 17140). Subsequently, in 1985, EPA discovered that the Florida Power Plant Siting Act supercedes in part the nonattainment new source review regulations under Florida law. Consequently, the Florida SIP is deficient with respect to electrical power plants. EPA plans to issue, in the near future, a federal register notice clarifying that two sets of nonattainment regulations will apply:

(1) For sources located in designated nonattainment areas, EPA's construction ban (40 CFR 52.24) applies to major sources and major modifications, and

(2) For sources locating in designated attainment or unclassifiable areas, EPA's Interpretative Ruling (40 CFR 51.18 Appendix S) will apply to major sources and major modifications.

The proposed source will be located in an area designated nonattainment for ozone, but is not a major source of VOC and, thus, will not subject to the construction ban.

PERMIT TO CONSTRUCT UNDER THE RULES FOR THE PREVENTION OF SIGNIFICANT DETERIORATION OF AIR QUALITY

Pursuant to and in accordance with the provisions of Part C, Subpart 1 of the Clean Air Act, as amended, 42 U.S.C. ¶7470 et. seq., and the regulations promulgated thereunder at 40 CFR ¶52.21, as amended at 45 Fed. Reg. 52676, 52735-41 (August 7, 1980),

South Broward County Resource Recovery Facility

is, as of the effective date of this permit (PSD-FL-108) authorized to construct a stationary source at the following location:

On a 248 acre tract at the southeast intersection of State Road 84 and US Route 441 in Broward County, Florida.

Upon completion of authorized construction and commencement of operation/production, this stationary source shall be operated in accordance with the emission limitations, sampling requirements, monitoring requirements and other conditions set forth in the attached Specific Conditions (Part I) and General Conditions (Part II)

This permit is hereby issued on _____ and shall become effective thirty (30) days after receipt hereof unless a petition for administrative review is filed with the Administrator during that time. If a petition is filed any applicable effective date shall be determined in accordance with 40 CFR ¶124.19(f)(1).

If construction does not commence within 18 months after the effective date of this permit, or if construction is discontinued for a period of 18 months or more, or if construction is not completed within a reasonable time, this permit shall expire and authorization to construct shall become invalid.

This authorization to construct/modify shall not relieve the owner or operator of the responsibility to comply fully with all applicable provisions of Federal, State, and local law.

_____ Date Signed

_____ Regional Administrator

PART I

Specific Conditions

1. Emission Limitations

a. Stack emissions from each unit shall not exceed the following:

(1) Particulate matter: 0.015 grains per dry standard cubic foot corrected to 12% CO_2 (gr/dscf-12%).

(2) Visible Emissions: Opacity of stack emissions shall not be greater than 15% opacity. Excess opacity resulting from startup or shutdown shall be permitted providing (1) best operational practices to minimize emissions are adhered to and (2) the duration of excess opacity shall be minimized but in no case exceed two hours in any 24-hour period unless specifically authorized by EPA for longer duration.

Excess emissions which are caused entirely or in part by poor maintenance, poor operation, or any other equipment or process failure which may reasonably be prevented during start-up or shutdown shall be prohibited.

(3) SO_2: 0.31 lb/MBtu heat input

(4) Nitrogen Oxides: 0.56 lb/MMBtu heat input

(5) Carbon Monoxide: 0.09 lb/MMBtu heat input

(6) Lead: 0.001 lb/MMBtu heat input

(7) Fluorides: 0.0018 lb/MMBtu heat input

(8) Beryllium: 9.3×10^{-7} lb/MMBtu heat input

(9) Each of the emission limits in conditions (1) and (3) through (8) is to be expressed as a 3-hour average based on the expected length of time for a particulate compliance test.

(10) Mercury: 2300 grams/day*

(11) Sulfuric Acid Mist: 8.5×10^{-4} lb/MBtu heat input

(12) The units are subject to 40 CFR Part 60, Subpart Db New Source Performance Standards (NSPS), except that where requirements in this permit are more restrictive, the requirements in this permit shall apply.

(13) There shall be no fugitive emissions from the refuse bunker and the ash handling and loadout. The potential for dust generation by ash handling activities will be mitigated by quenching the ash prior to loading in ash transport trucks. Additionally, all portions of the proposed facility including the ash handling facility which have the potential for fugitive emissions will be enclosed. Also those areas which have to be open for operational purposes, e.g., tipping floor of the refuse bunker while trunks are entering and leaving, will be under negative air pressure.

Only distillate fuel oil or natural gas will be used in start-up burners. The annual capacity factor for use of natural gas, as determined by 40 CFR 60.43b(d), shall be less than 10%.

*Total emissions from each unit shall not exceed this value.

b. Compliance Tests

(1) Compliance tests for particulate matter, SO_2, nitrogen oxides, CO, fluorides, mercury and beryllium shall be conducted in accordance with 40 CFR 60.8 (a), (b), (d), (e), and (f), except that an annual test will be conducted for particulate matter. Compliance tests for opacity will be conducted simultaneously during each compliance test run for particulate matter.

Compliance tests shall be conducted as specified herein by EPA and as required by 40 CFR §60.8. The permittee shall make available to EPA such records as may be necessary to determine the conditions of the performance tests and the methods to be used in obtaining representative RDF samples for ultimate analyses required in Method 19, Appendix A.

(2) The following test methods and procedures from 40 CFR Parts 60 and 61 shall be used for compliance testing:

a. Method 1 for selection of sample site and sample traverses

b. Method 2 for determining stack gas flow rate when converting concentrations to or from mass emission limits.

c. Method 3 for gas analysis when needed for calculation of molecular weight or percent CO_2.

d. Method 4 for determining moisture content when converting stack velocity to dry volumetric flow rate for use in converting concentrations in dry gases to or from mass emission limits.

e. Method 5 for concentration of particulate matter and associated moisture content. One sample shall constitute one test run.

f. Method 9 for visible determination of the opacity of emissions.

g. Method 6 for concentration of SO_2. Two samples, taken at approximately 30 minute intervals, shall constitute one test run.

h. Method 7 for concentration of nitrogen oxides. Four samples, taken at approximately 15 minute intervals, shall constitute one test run.

i. Method 8 for determination of sulfuric acid mist concentration and associated moisture content. Ons sample shall constitute one test run.

j. Method 10 (continuous) for determination of CO concentrations. One sample constitutes one test run.

k. Method 12 for determination of lead concentration and associated moisture content. One sample constitutes one test run.

l. Method 13A or 13B for determination of fluoride concentrations and associated moisture content. One sample shall constitute one test run.

m. Method 19 for determination of "F" factors in determining compliance with heat input emission rates and sulfur dioxide removal in Special Condition 1.a.(4).

n. Method 101A for determination of mercury emission rate and associated moisture content. One sample shall constitute one test run.

o. Method 104 for determination of beryllium emission rate and associated moisture content. One sample shall constitute one test run.

p. Method 25 or 25A for determination of volatile organic compounds. One sample shall constitute one test run.

2. The height of the boiler exhaust stack shall not be less than 200 feet above ground level at the base of the stack.

3. The incinerator boiler shall not be loaded in excess of their rated capacity of 71,875 pounds of RDF per hour each or 281.0×10^6 Btu per hour each.

4. The incinerator boilers shall have a metal name plate affixed in a conspicuous place on the shell showing manufacturer, model number, type waste, rated capacity and certification number.

5. The permittee must submit to EPA and DER within fifteen (15) days after it becomes available to the County, copies of technical data pertaining to the incinerator boiler design, scrubber designing electrostatic precipitator design, and the fuel mix that can be used to evaluate compliance of the facility with the preceeding emission limitations.

6. Grease, scum, grit screenings or sewage sludge shall not be charged into the solid waste to energy facility boilers.

7. Air Pollution Control Equipment

   The permittee shall install, continuously operate, and maintain the following air pollution controls to minimize emissions. Controls listed shall be fully operational upon start-up of the proposed equipment.

   a. Each boiler shall be equipped with a particulate emission control device for the control of particulates.

   b. Each boiler shall be equipped with an acid gas control device designed to remove at least 90% of the acid gases.

8. Stack Monitoring Program

   The permittee shall install and operate continuous monitoring devices for oxygen and stack opacity. The monitoring devices shall meet the applicable requirements of Rule 17-2.710, FAC, 40 CFR Part 60, Subparts A and Db, Sections 60.13 and 60.48b respectively, except that emission rates shall be calculated in units consistent with emission limits in this permit. The conversion procedure shall be approved by EPA.

9. Reporting

   a. A copy of the results of the stack tests shall be submitted within forty-five days of testing to the DER Bureau of Air Quality Management, the DER Southeast Florida District Office, Broward County and EPA Region IV.

   b. Stack monitoring shall be reported to the DER Southeast District Office and EPA Region IV on a quarterly basis in accordance with Section 17-2.710, FAC, and 40 CFR, Part 60, Subsections 60.7 and 60.49b.

10. Fuel

    The Resource Recovery Facility shall utilize refuse such as garbage and trash (as defined in Chapter 17-7, FAC) but

not sludge from sewage treatment plants as its fuel. Use of alternate fuels would necessitate application for a modification to this permit.

11. Addresses for submitting reports are:

a. EPA - Region IV

Chief, Air Compliance Branch
U.S. Environmental Protection Agency
345 Courtland St.
Atlanta, GA 30365

b. DER

Chief, Compliance and Ambient Monitoring
Bureau of Air Quality Management
Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32301

c. Southeast District Office of DER

District Manager
Department of Environmental Regulation
3301 Gun Club Road
P. O. Box 3858
West Palm Beach, FL 33402

d. Broward County

Broward County Environmental Quality Control Board
500 Southwest 14th Court
Ft. Lauderdale, Florida 33315

PART II

General Conditions

1. The permittee shall comply with the notification and record-keeping requirements codified at 40 CFR Part 60, Subpart A, ¶ 60.7.

2. The permittee shall retain records of all information resulting from monitoring activities and information indicating operating parameters as specified in the specific conditions of this permit for a minimum of two (2) years from the date of recording.

3. If, for any reason, the permittee does not comply with or will not be able to comply with the emission limitations specified in this permit, the permittee shall provide EPA with the following information in writing within five (5) days of such conditions:

   (a) description of noncomplying emission(s),
   (b) cause of noncompliance,
   (c) anticipated time the noncompliance is expected to continue or, if corrected, the duration of the period of noncompliance,
   (d) steps taken by the permittee to reduce and eliminate the noncomplying emission, and
   (e) steps taken by the permittee to prevent recurrence of the noncomplying emission.

   Failure to provide the above information when appropriate shall constitute a violation of the terms and conditions of this permit. Submittal of the aforementioned information does not constitute a waiver of the emission limitations contained within this permit.

4. Any proposed change in the information submitted in the application regarding facility emissions or changes in the quantity or quality of materials processed that would result in new or increased emissions or ambient air quality impact must be reported to EPA. If appropriate, modifications to the permit may then be made by EPA to reflect any necessary changes in the permit conditions. In no case are any new or increased emissions allowed that will cause violation of the emission limitations specified herein. Any construction or operation of the source in material variance with the application shall be considered a violation of this permit.

5. In the event of any change in control or ownership of the source described in the permit, the permittee shall notify the succeeding owner of the existence of this permit and EPA of the change in control of ownership within 30 days.

6. The permittee shall allow representatives of the state and local environmental control agency or representatives of the EPA upon the presentation of credentials:

   (a) to enter upon the permittee's premises, or other premises under the control of the permittee, where an air pollutant source is located or in which any records are required to be kept under the terms and conditions of the permit;

   (b) to have access to and copy at reasonable times any records required to be kept under the terms and conditions of this permit, or the Clean Air Act;

   (c) to inspect at reasonable times any monitoring equipment or monitoring method required in this permit;

   (d) to sample at reasonable times any emissions of pollutants; and

   (e) to perform at reasonable times an operation and maintenance inspection of the permitted source.

7. The conditions of this permit are severable, and if any provision of this permit or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this permit shall not be affected thereby.