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PLEASE REPLY TO:

Tallahassee

MEMORANDUM

TO: Richard Donelan
Clair Fancy
Larry Keesey
Buck Oven
William Perry
Gardner Strasser
Kent Zaiser

FROM: David S. Dee D. Dee

DATE: March 31, 1988

RE: Pasco County Resource Recovery Facility

Enclosed for your review is a summary of my notes from the depositions of Bonnie Saylor, the Treasurer of the Shady Hills Civic Association and Ed Kooper, one of the Civic Association's witnesses. You should review this memorandum because it will identify the issues of concern for the Civic Association. These issues also will be the subject of cross-examination by the Civic Association and, accordingly, you should be prepared to answer questions lying within your area of expertise. Of course, Pasco County also will prepare a response for each of these issues.

DSD/vc:pasco-dep4

Copied: C HFancy

6. The Civic Association wants to use source separation and recycling as a form of best available control technology (BACT) and thereby minimize emissions from the plant. By eliminating plastics and styrofoam from the waste stream, they believe they will improve the facility's fuel supply and implement BACT.

7. The Civic Association is concerned that the ambient air quality at the site was not adequately evaluated. The roads near the site are made of limerock and, consequently, there is a substantial amount of dust and particulate matter in the air. They believe this particulate matter was not adequately considered in the evaluation of ambient conditions. They also believe the air quality at Chassahowitzka was used to determine the conditions at the site.

8. The Civic Association is concerned about the toxicity of the fly ash. They also wonder whether adequate safeguards will be utilized when the ash is transported. They do not want fugitive particulate emissions or leaky trucks.

9. The Civic Association is concerned that hospital waste containing radioactive substances may be deposited at the landfill.

10. Sinkholes may form and rupture the landfill liner.

11. The liner is only guaranteed for two years.

12. The runoff from the fly ash may ruin the aquifer.

13. The drawdown from the County's wells will increase the number of sinkholes in the area.

14. The use of heavy equipment on the site will increase the number of sinkholes.

15. The pipelines from the Hudson Regional wastewater treatment plant may rupture and spill wastewater.

16. CDM's analysis is based on waste streams, projects, and other sites which may not be similar to the situation in Florida. Other communities may not use as much styrofoam and plastic as Pasco County. One of the resource recovery facilities sited in the CDM report was located at Braintree, Massachussetts and it has been closed.

17. The risk to children from pollution is six times greater than the risk to adults.

18. The site is a high recharge area for the Floridan aquifer. Covering the site with a synthetic liner will cause groundwater problems and reduce the site's value as a recharge area.

19. The wastewater used in the cooling towers will contain viruses and "solids."

20. The Civic Association wants Pasco County to utilize total recycling. 100% recycling is performed in Rome, Italy. 20% recycling has been achieved in Berkley, California.

21. A letter from the Florida Game and Fresh Water Fish Commission states that indigo snakes are on the site. See Volume II, Section 10.7.

Ed Kooper

Kooper is concerned about: dioxin; the cost of the facility; NOx emissions; and the toxicity of the dry ash.

1. Kooper believes an ammonia injection system should be used to remove NOx.

2. Tampa Bay is one of the 35 worst air pollution areas in the United States.

3. Kooper has a bachelor of science degree in mechanical engineering (1947) from Newark College. He took some graduate courses in management and metallurgy. He then worked at Gray Iron Research for five years with pollution control equipment, including baghouses and wet scrubbers. He went to Canada for one year and then worked on the Cummings staff in quality control for seven or eight years. He then operated the Anniston, Alabama foundry for Dresser Industries from 1965 to 1970. From 1970 to 1974, he operated his own plastics company. He then retired in 1974.

4. He claims to be an expert concerning the combustion and operation of a "burn unit" and somewhat of an expert concerning pollution control. He also claims to be somewhat of an expert concerning resource recovery as a result of his 1,000 hours of study, correspondence and investigation over the last 4 or 5 years.

5. He has visited the Pinellas and Hillsborough County resource recovery projects, but he has not visited any composting, source separation, or RDF facilities.

6. He spent 6 to 8 hours reviewing the County's application, but he has not read all of it.

7. He discussed dioxin studies in Europe which reportedly demonstrated that dioxin first appeared in the 1930's or 40's as a result of resource recovery facilities.

8. He has received and reviewed literature concerning an 11 year old plant in Ontario which uses composting for 900 tpd.

9. He has read about a plant in Delaware which processes 1,000 tpd of solid waste, 300 tpd of sludge. It is an RDF plant, approximately 4 or 5 years old.

10. He believes organic materials should be composted. Plastics should be separated. Until a process is developed for the use of plastics, he recognizes that they might have to be burned or landfilled.

11. Kooper claims that a Hamburg plant is successfully using source separation for plastics.

12. Kooper claims a study in Western Canada (Prince Edward Island?) found that dioxin withstood 1800 degree temperatures.

cc: Richard Donelan
Clair Fancy
Kent Zaiser
Larry Keesey
Buck Oven
William Perry

pasco-dep3

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TALLAHASSEE, FLORIDA 32302

CLAIR FANCY
DEPARTMENT OF ENVIRONMENTAL
REGULATION
2600 BLAIR STONE ROAD, TWIN TOWERS OFFICE BLDG.
TALLAHASSEE, FLORIDA 32399

PM
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MAR 28 1988

DER-BAQM

PLEASE REPLY TO: Tallahassee

March 25, 1988

Hamilton S. Oven, Jr.
Department of Environmental
Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399

Re: Pasco County Resource Recovery Facility

Dear Mr. Oven:

As you know, this firm represents Pasco County (Pasco) with regard to the environmental permitting of the Pasco resource recovery facility. We have been advised that Hernando County (Hernando) wants to dispose of some of its solid waste at the Pasco resource recovery facility. Pasco and Hernando currently are negotiating and it appears likely that an agreement concerning this issue will be ratified on March 29, 1988.

Under the terms of the proposed agreement, Hernando would be allowed to bring solid waste to Pasco's resource recovery facility after the facility has been built, passed its compliance tests, and started commercial operations. Hernando would bring 100 tons per day (monthly average) of solid waste. All of Hernando's waste must be processable (i.e., burnable) in the resource recovery facility. No hazardous waste would be accepted. The agreement would remain in existence for ten years.

To accommodate Hernando, Pasco would initially construct its resource recovery facility with three combustion units capable of handling 350 tons per day (tpd), rather than 300 tpd, as currently proposed. This change should not be significant, however, because the County's facility would have a capacity of 1,050 tpd, which is substantially less than the ultimate site capacity of 1,200 tpd that Pasco has requested for approval in this site certification proceeding.

The proposed change in capacity would not change the environmental impacts of the project. The County's application and environmental analysis of the resource recovery facility were based on the ultimate site capacity of 1,200 tpd. For example, the analysis of air quality, water supply, wastewater, and traffic were based on 1,200 tpd.

We are aware of only two conditions of certification that would be affected by the proposed increase in the initial size of the resource recovery facility. Page 11, ¶ ¶ 1.c. and 1.e. of the conditions refer to the capacity of the boilers. These numbers may need to be changed. If we identify any other potential changes in the conditions, we will notify you immediately.

We believe this proposed change will provide substantial benefits to the citizens of Pasco and Hernando Counties. Hernando currently disposes of its solid waste in a state forest. Hernando's new proposal would allow it to utilize a more appropriate method of and location for solid waste disposal. The citizens of Pasco will benefit from this proposal because the initial size of the Pasco County facility will be increased by 150 tpd and thus there will be an additional 50 tpd of excess capacity available to accommodate future growth in Pasco. After Pasco's ten year contract with Hernando expires, Pasco will have an additional 100 tpd of excess capacity available to accommodate growth.

We will notify you as soon as we learn whether if Pasco and Hernando have executed their agreement. In the interim, please call me if you have any questions or comments.

Sincerely,

David S. Dee

cc: Richard Donelan
Kent Zaiser
C. Larry Keesey
Ed Helvenston
M. Twomey
Paul Darst
Barry Andrews
Clair Fancy ✓

DSD/vc:oven-3
Copied: Pradeep Raval
Tom Rogers
CHF/BT
Barry Andrews
3-28-88

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PLEASE REPLY TO:
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March 22, 1988

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DER - BAQM

Hamilton S. Oven, Jr.
Administrator
Siting Coordinating Section
Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399

RE: Pasco County Resource Recovery Facility
Power Plant Siting Application
PA 87-23, DOAH Case No. 87-5337

Dear Mr. Oven:

As you know, this law firm represents Pasco County in its efforts to obtain site certification for the proposed Pasco County resource recovery facility. We have reviewed the report prepared by the Florida Department of Environmental Regulation (DER) concerning the proposed Pasco County facility and have discovered several issues that should be brought to your attention. The following preliminary comments address some of the most important issues, but they are not intended to be comprehensive. We hope to address these and other issues with you in the immediate future.

For the purposes of this letter, underlined words should be added to the text of the DER report and the conditions of site certification. Words that have been ~~stricken~~ should be deleted.

DER Report

Page 2, ¶ 1

The description of the proposed facilities should acknowledge that the County will build "an ash and solid waste disposal area, . . ."

Page 24, ¶ E

The last half of this paragraph has been inadvertently transposed to the top of page 25.

Page 26, ¶ 3

The County hired a zoologist to conduct an in-depth evaluation of the gopher tortoise populations at the site. She concluded that the northeastern portion of the site would not be an appropriate area for relocating the gopher tortoises. Accordingly, the County disagrees with the contrary statements in the report submitted by the Florida Game and Fresh Water Fish Commission and the County opposes any proposal which would utilize the northeastern portion of the site for the relocation and management of gopher tortoises.

Page 28, ¶ B(2)

The proposed facility will reduce the amount of imported fuel oil by more than 9,000,000 barrels over the life of the project, rather than 900,000 barrels.

Page 29, ¶ D

The facility's cooling system "will require approximately 420 gpm of make-up water."

Page 31, ¶E(5)(a)

The precise amount of water used at the resource recovery facility will depend upon a variety of factors. Accordingly, the text should note that the predicted "volumes of water are estimated ~~expected~~ to be produced by the resource recovery facility during normal daily operation. . . ."

Page 36

The table indicates that the maximum annual emission of

arsenic will be 0.191 tons per year. The appropriate number should be 0.019 tons per year.

The table inadvertently indicates that the PSD significant emission rate for arsenic is 0, but there is no significant emission rate for arsenic.

Page 41, ¶ 2

The BACT determination for lead (0.005 lbs/ton of refuse charged) is too restrictive. The appropriate emission rate should be 7.82 x E-4 at 12% CO_2. The attached table (Table 4-1) was previously submitted to the Department and it identifies the appropriate emission rates for this facility.

Page 42, ¶ 1

The BACT determination for mercury (0.0036 lbs/ton of refuse charged) is too restrictive. The appropriate emission rate should be 4.38 x E-6 gr/dscf at 12% CO_2. See the attached table.

Page 46, ¶ 3

Dry scrubbers have control efficiencies for SO2 in the range of 70 to 80%, but not 80 to 90%.

Page 48, ¶ 1

The Stanislaus facility is not located in an NO_2 nonattainment area.

Page 49, ¶ 3

The last two sentences in this paragraph should be deleted. The reference to the California South Coast Air Quality Management District guideline apparently is for LAER.

Page 51, ¶ 4

EPA's "good combustion practices" are only preliminary and should not be included as permit requirements. Pasco County does not want to use EPA's preliminary proposals as permit conditions.

Page 53, ¶ 1

The proposed CO emission limit of 50 ppm based on a 4 hour average is not appropriate. The limit should be 104 ppm at 7% O_2 based on an 8 hour average.

Page 53, ¶ 2

Thermal deNOx controls for NOx are not appropriate in this case and should not be required as BACT.

Page 54

The proposed emission limit for sulfur dioxide is too restrictive. The limit should be based on 100 ppmdv at 7% O_2 or 70% reduction by weight. As previously noted, the lead and mercury emission limits are too low.

Page 55, ¶ 2

It is unnecessary to have six continuous monitoring systems for each flue. The monitor for NOx seems especially inappropriate.

The requirement for combustion efficienty apparently is based on a New York requirement. However, the State of New York requires a combustion efficiency of 99.8% on a seven day average and 99.5% for an eight hour average.

Page 58, ¶ 2, line 10

The text indicates that the stack characteristics used in the refined modeling for the Pasco County facility are summarized in Table 1 on page 59, but Table 1 does not describe the stack characteristics.

Page 61

The maximum concentration of fluorides should be 0.0124, not 0.124 ug/m^3.

The de minimus monitoring level for lead is a quarterly value, not a 24 hour value.

Page 70, ¶ E. 7. a.

Construction equipment may temporarily increase noise levels above that of traffic and existing noises.

Page 70, ¶ E.8.

Construction debris will be landfilled in either a Class I or III site. However, we do not wish to imply that paper and plastic will be landfilled. Accordingly, the text should state that "construction debris such as ~~paper,~~ concrete, and ~~plastic~~ brick will be transported to the County's existing landfill for disposal. . . .

Page 71, ¶ 1, lines 3-6

The text should be modified as follows: "If one-half of the plant would remain out of operation beyond a week, incoming raw waste would be diverted to the associated landfill/ashfill ~~other county landfills~~ until processing operations resume."

Page 73, ¶ 2.a.

The resource recovery facility should not contribute to any violations of ambient air quality standards under any meteorological conditions that were modelled or considered pursuant to state or federal law.

Conditions of Certification

Page 1, § II, line 2

The text should be modified to refer to the Permittee "defined as the Applicant, ~~Vendor~~, or its successors and assigns".

Page 5, § XII, lines 8-9

The text should be modified to show that "Requests for modifications ~~of monitoring requirements~~ shall not be unreasonably withheld by the Department."

Page 6, § XIII

Pasco County intends to expedite the construction of this project. It will be extremely difficult for the County to maintain its expedited timetable if the County is required to seek and receive the Department's approval for all of the plans prior to the initiation of construction. Section XIII should be modified to require the County to submit "as-built" plans to the Department for a determination of consistency with the approved design.

It should be noted that there will not be any "hazardous, toxic, or pathological handling facilities" at the proposed Pasco County resource recovery facility and, therefore, there will be no plans for such facility. The reference to these facilities should be deleted from Section XIII.

Page 7, line 2.

Pasco County has already submitted the forms required by Chapters 17-25 and 40D-40 to the Southwest Florida Water Management District and they have been approved by the SWFWMD Governing Board. In addition, the references to a "a temporary berm" and the Fort Lauderdale compost plant appear to be inapplicable to this project. Consequently, the Department should delete all of the provisions in this paragraph that occur after line 2.

Page 8, ¶ 5.

This condition should be deleted. In the alternative, it should refer to the routine noises of operation and not include temporary construction noises.

Page 8, ¶ 6.

A fugitive particulate abatement plan should not be required because it will provide little or no significant benefit. If required, however, the fugitive particulate abatement plan should be submitted to the Department 30, not 120, days prior to start of construction.

Page 8, ¶ 8

This paragraph is unclear, inaccurate, and should be

modified. The County should be required to "minimize the removal of trees and maintain a vegetative buffer around the site to the greatest extent practicable."

Page 10, ¶ 1. a.

The emission rates for SO2, carbon monoxide, lead, mercury, and arsenic are too low. See the attached table for the appropriate emission rates.

Page 10, ¶ 1. a. (4)

The emission limitation for carbon monoxide should be 104 ppmdv at 7% O_2 for an 8 hour averaging time.

Page 10, ¶ 1. a. (10)

The emission limitation for arsenic should refer to E-6, not E-5, lb/MBtu heat input.

Page 11, ¶ E

The last sentence of this paragraph refers to the use of supplemental oil. The County does not intend to use supplemental oil. The County will only use natural gas.

Page 12, ¶ 2. a.

The maximum emission rate for particulates should be 0.015, not 0.15, grains per dscf.

Page 12, ¶ 2. b.

The Department should delete the requirement which would maintain an average temperature in the flue gas of less than 300 degrees fahrenheit (3 hour rolling average). This requirement is unnecessary. It would be difficult or impossible to determine if the County were in compliance.

Page 12, ¶ 2. c.

The selected emissions control system should be evaluated solely for consistency with the County's proposed design. The system must be reviewed promptly to enable the County to proceed with its expedited construction schedule. Accordingly, the last sentence of the paragraph should be modified to state that "the data shall be processed and approved or denied in accordance with ~~P.S. 120.60~~ Section XIII above."

Page 13, ¶ c, line 2

The County interprets the reference to "a commercial testing firm" to include a commercial testing company which is a branch or division of the company which builds and operates the facility.

Page 13, ¶ c, line 5

After the initial compliance testing, the facility should be tested annually for particulate matter only. The proposed condition implies that all substances must be tested annually.

Page 13, ¶ 4. a.

The emission tests should be submitted to the Southwest, not the Southeast, District office. The data should not be submitted to the Broward County Environmental Control Board. The references to the Southeast District Office in paragraphs 4. b. and 4. c. should be corrected.

Page 14, ¶C.

The plans should not be submitted to the Southwest Florida Water Management District because SWFWMD normally would not review the plans for the leachate and sewage facilities. To ensure an expedited timetable for construction, the last sentence in this paragraph should be modified to state that the plans and specifications shall be furnished "to the Southwest District Office for approval pursuant to Section XIII above ~~120 days prior to construction~~."

Page 15, ¶3. a.

The last sentence of this paragraph should be deleted. A specific monitoring program has already been proposed by Pasco County and approved by the Department. Most of the monitoring wells have already been installed. The groundwater monitoring program is shown on Figure 4-1 and Sheet No. 7 in Volume IV of the Pasco County application for power plant site certification. This requirement should be modified to state that the monitoring wells shall be installed in the locations identified in the County's application.

Page 17, ¶ 1

This provision should be modified to state that the plans of the final landfill design "shall be provided to the Department for review and approval pursuant to Section XIII, above, at least 60 ~~180~~ days prior to the the start of operation."

Page 19, ¶¶ 9 and 11

The County interprets these provisions to require appropriate testing of the ash residue and appropriate disposal practices. At this time, it is clear that the EP Toxicity Test is not a valid method for testing ash residue. It also is clear that the ash is not a hazardous waste. Of course, the County will comply with future testing and disposal requirements for ash.

Page 20, ¶ 17.

The paragraph does not identify the agency that should receive the construction schedule or chart. We assume that these materials should be sent to the Southwest District Office.

Page 21, ¶ 18.

DER Form 17-7.130(2) refers to a construction permit number. Paragraph 18 should state that the site certification number shall be used as the construction permit number in this DER form.

Page 28, ¶ A.

Paragraphs A, B, C, and D on page 28 do not indicate when the required activities are to be completed. Pasco County suggests that they should be completed 180 days after the start of commercial operations at the resource recovery facility.

Page 28, ¶ B.

This paragraph does not clearly describe what is required. If the plant breaks down, it will not be operated.

Page 28, ¶ D.

Pasco County will not accept hazardous waste at this site and, therefore, Pasco County will not submit any drawings showing any facilities for such substances.

Page 30, § XXI, ¶ A.

This paragraph should be deleted or modified. The County will utilize reclaimed water as its primary source of cooling water. The County has requested and received SWFWMD's approval to use a well as an alternative source of cooling water. The limitations on the use of the well are set forth at pages 24-27, above, in Section XVI, SWFWMD Consumptive Use Permitting.

Conclusion

The preceding comments have been terse because we do not have adequate time to fully describe our concerns in writing. However, we will be happy to discuss each of these issues with you in more detail.

Sincerely,

David S. Dee

David S. Dee

cc: Ben Harrill
Richard Donelan
Clair Fancy
Don Elias
Dan Strobridge

Copied: Pradeep Raval
Tom Rogers
Barry Andrews
CHF/BT
3.23.88

TABLE 4

POLLUTANT EMISSIONS RATES

Pollutant	Averaging Time	Controlled Concentrations at Stack Top[3]
Particulate Matter (TSP or PM_{10})	24-Hour	0.0156 gr/dscf at 12% CO_2
Carbon Monoxide	8-Hour	104 ppmdv at 7% O_2
Nitrogen Oxides	3-Hour	417 ppmdv at 7% O_2
Sulfur Dioxide	3-Hour	104 ppmdv at 7% O_2
Volatile Organic Compounds (as CH_4)	3-Hour	38.8 ppmdv at 7% O_2
Lead	24-Hour	7.82×10^{-4} gr/dscf at 12% CO_2
Beryllium	24-hour	6.56×10^{-8} gr/dscf at 12% CO_2
Mercury	24-Hour	4.38×10^{-6} gr/dscf at 12% CO_2
Inorganic Arsenic	24-Hour	7.09×10^{-4} gr/dscf at 12% CO_2
Fluorides	3-Hour	1.20 ppmdv at 7% O_2
Sulfuric Acid Mist	--	(1)
Hydrogen Chloride[2]	3-Hour	104 ppmdv at 7% O_2
Dioxin[2] (as 2,3,7,8-TCDD toxics equivalent)	24 Hour	3.92 ng/Nm^3 at 12% CO_2

(1) EPA Region IV has determined that there is no reliable testing method for this pollutant.

(2) Not a PSD regulated pollutant.

(3) Concentrations represent short-term operating release rates as modeled in the air quality analysis.

FEDERAL EXPRESS **QUESTIONS? CALL 800-238-5355 TOLL FREE.**

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[redacted] Date 3/9/88

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Department/Floor No.

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City: [illegible] State: FL

ZIP Required For Correct Invoicing: [illegible]

2 To (Recipient's Name) Please Print: Mr. Barry Andrews

Recipient's Phone Number (Very Important): ( )

Company: Florida Department of Environmental Regulation

Department/Floor No.

Exact Street Address (Use of P.O. Boxes or P.O.* Zip Codes Will Delay Delivery And Result in Extra Charge.): Air Quality Section, 2600 Blair Stone Road

City: TAllahassee, State: FL

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Tampa, FL

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environmental engineers, scientists, planners, & management consultants

CAMP DRESSER & McKEE INC.

One Tampa City Center, Suite 1750
Tampa, Florida 33602
813 221-2833

March 9, 1988

Mr. Barry Andrews
Florida Department of
Environmental Regulation
Air Quality Section
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Dear Mr. Andrews:

This letter, with attachments, represents our formal response to your request for additional information concerning our BACT analysis with respect to NO_x control. Our preliminary analysis of the costs for Thermal $DeNO_x$, dated January 12, 1988, was based on an initial review of information provided by Exxon. As you will recall, it indicated that the Thermal $DeNO_x$ system would cost approximately $968 for each ton of NO_x removed at the Pasco County facility, and thus increase the facility tipping fee by $1.40 per ton of waste combusted. (These costs were based on a NO_x removal efficiency similar to that which is achieved at the Commerce, California facility [40 percent]; the only operating $DeNo_x$ installation at this time.)

CDM has discovered, however, that these figures obtained from Exxon are misleading, and in fact, contradict analyses recently conducted for the 3,000-tpd Fairfax County, Virginia refuse combustion facility. The Virginia Air Pollution Control Board issued a construction permit without Thermal $DeNO_x$ to the Full Service Company (FSC) whose analysis indicated a cost of $3 per ton of waste combusted and approximately $2,000 per ton of NO_x removed. The FSC's analysis was based on an optimistic NO_x removal efficiency of 50 percent. CDM's analysis has shown that use of Thermal $DeNo_x$ would increase the Pasco County Resource Recovery Facility's tipping fee by approximately $3 per ton. It also indicates a cost of approximately $2,478 per ton for NO_x removal (based on a 40 percent NO_x reduction).

As can be seen, the costs for controlling NO_x at the Fairfax facility is more than two times larger than those obtained from Exxon for Pasco County. This significant difference is attributed to the costs associated with the risks the FSC would encounter in using the Thermal $DeNO_x$ system. Some of these risks include:

- Boiler fouling and/or corrosion which could lead to facility downtime.

- Environmental opacity violations from the possible formation of a visible NH_4Cl stack plume.

- Environmental emission violations for the release of ammonia which has an acrid odor, or the formation of other pollutants such as cyanide.

Recent conversations with prospective FSCs have confirmed that costs associated with vendor risk would be passed on to and borne by the county.

Standard combustion controls, including proper distribution of overfire and underfire air and temperature controls, are proposed for controlling NO_x emissions at the Pasco County facility. The temperature within the furnace chamber will be below 2,100°F, thus inhibiting the formation of thermal NO_x. Also, O_2 analyzers will be installed on each combustion train to ensure that the proper quantity of excess air is added to the furnace. Additionally, cost estimates for NO_x removal are 248 percent of the $1,000/ton of NO_x removal cited by FDER. NO_x emissions from the facility are projected to be 6.17 pounds per ton of municipal solid waste. This equates to 1,351 tons per year based on 100 percent availability. At this rate, the maximum annual predicted NO_2 impact concentration is 1.03 ug/m^3, which is below the annual NO_2 NAAQS/FAAQS of 100 ug/m^3. Hence, additional NO_x controls would be of very little environmental benefit. Therefore, BACT for nitrogen oxides is proposed to be the combustion controls inherent in the system's design.

Based on CDM's analysis, therefore, additional NO_x control is not warranted since:

- Exxon's Thermal DeNO$_x$ system has very limited operating data on U.S. MSW facilities.

- The projected NO_2 environmental impacts from a Pasco County facility will be within compliance of the NAAQS/FAAQS.

- It is being used as an innovative technology in an NO_x non-attainment area as LEAR.

I have included, as an attachment to this letter, a package which discusses CDM's analysis in greater detail. If you have any questions, or require additional information, please feel free to contact me.

Sincerely,

CAMP DRESSER & McKEE INC.

Daniel E. Strobridge

DES:jlb

PC7T.10/21

cc: Mr. Clare Fancy | 6T
Mr. Hamilton S. Oven, Jr.
Mr. Bruce Miller
Mr. Wayne Aronson
Pradeep Raval
Tom Rogers
Barry Andrews } 3.10.88 my

PASCO COUNTY, FLORIDA
AIR PERMIT APPLICATION

4.6.1 BACT DETERMINATION FOR OXIDES OF NITROGEN (NO_x)

Introduction

NO_x emissions from the proposed Pasco County RRF will be inherently controlled by furnace design and operation. Thermal NO_x formation will be inhibited by controlling flame temperatures. Currently, NO_x control techniques other than standard refuse combustion control techniques (i.e., the proper distribution of combustion overfire and underfire air supply and temperature maintenance) are not normally applied to mass-burning systems. It is interesting that within the refuse combustion industry, state regulatory agencies have recently focused much attention toward the destruction of organic emissions such as dioxins and furans. The methods generally suggested include high furnace temperatures and retention times; however, these furnace operating techniques tend to increase thermal NO_x emissions. Thus, an emission trade-off exists between controlling organic emissions and NO_x. The cost for NO_x controls are projected to be unreasonable based upon recent FDER and U.S. EPA guidance. The following analysis is presented to support this statement.

Background

Oxides of nitrogen (NO_x) are products of combustion processes, including refuse combustion; nitric oxide (NO) is the predominant form produced. During the combustion process, a small amount of NO is further oxidized to form nitrogen dioxide (NO_2), a brown-red gas. NO_x which reacts with sunlight and hydrocarbons to form ozone (O_3) and other secondary pollutants.

NO_x emissions are generated during fuel combustion by two separate sources. NO_x is formed by the reduction and subsequent oxidation of the available organically-bound nitrogen in the fuel (fuel NO_x). NO_x formation also results from high temperature oxidation of atmospheric nitrogen which enters into the combustion process as part of the combustion air (thermal NO_x).

Though the precise mechanism by which fuel and combustion air nitrogen are converted to NO_x is not completely understood, the relative quantities of fuel NO_x and thermal NO_x are known to be related to furnace design factors, refuse composition and plant operating parameters. Reports generally support the theory that most NO_x emissions resulting from refuse firing are oxidized fuel nitrogen.

NO_x Controls

The prime factors which affect the formation of thermal NO_x are the quantity of oxygen present in the combustion zone and the flame temperature. The rate of nitrogen oxide formation tends to increase significantly when temperatures are above 2100°F, particularly if the oxygen concentration in the combustion zone is greater than approximately 2 percent by volume. Fuel NO_x formation is strongly affected by the mixing rate of the fuel and combustion air (flame intensity), the quantity of oxygen present in the primary combustion zone, and the nitrogen content of the fuel.

Other Methods of Controlling NOx Emissions

Besides reducing NO_x emissions through furnace design and operation, NO_x emissions may potentially be reduced at refuse-burning facilities by other methods: minimizing the quantity of NO_x generated during combustion (combustion modification), and by reducing the quantity of NO_x in the flue gas stream (flue gas controls).

Combustion modification techniques such as flue gas recirculation (FGR) and staged combustion can potentially be used to reduce NO_x emissions from refuse-fired incinerators. FGR, however, has been employed more than staged combustion on MSW facilities with applications in Japan, West Germany, and Denmark. These types of combustion modifications have not been employed on U.S. MSW facilities.

Staged Combustion. In staged combustion, fuel is burned under starved air conditions such that the combustion gas temperatures are significantly below the adiabatic flame temperature and until there is no available oxygen. Following some heat removal in the boiler, additional air is added downstream to allow complete combustion of the cooler flue gases. The initial step drives the fuel nitrogen into the gas-phase with the net-effect of lowering the amount oxidized during combustion to thermal NO_x levels at the reduced temperature.

Staged combustion has been applied successfully to fossil fuel fired boilers. Tests of its effects on a tangentially-fired pulverized coal boiler operating at 16 percent excess air indicated that a NO_x emission reduction of 33 percent was achievable. The direct application of these results to MSW combustion are not possible. The tangential burning of pulverized coal at 16 percent excess air is a completely different mechanism than the moving grate or travelling grate spreader stoker operating at much higher excess air levels in MSW combustion.

To some extent, a form of staged combustion can be attempted in today's MSW furnaces through the strategic use of underfire and overfire air injection. Informal testing at a North Andover, MA MSW facility on the effects of controlled and reduced combustion air levels on NO_x emissions showed approximately a 20 percent reduction. The test conditions, however, resulted in immediate boiler instability and slagging with the expectation of future boiler corrosion. It was concluded that this approach to staged combustion as a NO_x control method for MSW incinerators is not feasible due to boiler problems and associated reduction in availability. Thus, the

possible operational problems associated with staged combustion and its lack of application on U.S. MSW facilities does not warrant its implementation at the Pasco County RRF.

Flue Gas Recirculation. Flue gas recirculation (FGR) is a combustion modification which reduces NO_x emissions by extracting a portion of the flue gas and returning it to the furnace through the burner windbox. FGR operates by lowering peak flame temperatures by dilution thus, decreasing thermal NO_x formation. The system consists of an FGR fan assembly, air apportioning and mixing system, and ductwork necessary to connect the stack to the furnace or underfire or overfire air system. Because the recirculated flue gas is relatively cool, the bulk furnace temperature decreases, resulting in a reduction of thermal NO_x formation. FGR is commercially available and applicable to all gas and distillate oil-fired industrial boilers, since NO_x emissions due to firing of these low-nitrogen fuels are contributed mostly by thermal NO_x. FGR is not, however, as effective for residual oil- and coal-fired boilers, since much of the total NO_x emissions may be attributed to fuel-NO_x, the type of NO_x minimally controlled by FGR.

FGR has been applied at MSW facilities in Japan and Europe by ducting cool flue gas from a point after the air pollution control device back to the underfire air fan. Since MSW contains relatively high amounts of nitrogen, as with coal and residual oil, and since it is generally accepted that NO_x generated from refuse is primarily due to fuel nitrogen conversion and not oxidation of atmospheric nitrogen, flue gas recirculation is expected to achieve only limited NO_x reduction on refuse-fired facilities. Results from experimentation at a 660-TPD refractory wall furnace at the Kita refuse burning facility in Japan indicated that a 25-percent NO_x emission reduction was achievable.

Little data is available to support that FGR will improve NO_x control at the Pasco County RRF facility when used in conjunction with the proposed combustion controls. Thus, FGR would be expected to be only of limited

effectiveness in controlling NO_x and, therefore, does not warrant the installation expense and lower fuel efficiency caused by a decrease in optimum flame temperature.

Flue Gas Controls

Flue gas controls appear to offer the greatest potential for NO_x reduction, though their application on full-scale RRFs has been limited. The controls which have been applied to combustion processes are selective catalytic reduction (SCR) and selective non-catalytic reduction (SNCR). The SNCR (also referred to as Thermal $DeNO_x$) is a patented process of Exxon Research and Engineering and involves the intimate contact of ammonia and flue gas NO_x in the boiler through the use of injectors located in the boiler waterwalls. Like SNCR, the SCR technology also injects ammonia into the flue gas, however, its reaction with NO_x is at a lower temperature and enhanced by using a catalyst bed.

Selective Catalytic Reduction (SCR). In the SCR process, after the anhydrous ammonia is injected into the flue gas stream, the mixture passes through a catalyst bed, located between the boiler and the economizer, where NO is converted to N_2. The function of the catalyst is to effectively lower the activation energy of the NO decomposition reaction. The reaction is allowed to proceed in a cooler part of the flue gas stream, rather than in the furnace at high temperatures (1600-1800°F) as required with the SNCR. Optimum temperature for reduction using SCR is between 530 and 800°F. Lower temperatures yield slow reaction rates; higher temperatures result in a shortened catalyst life.

SCR systems have been experimented at facilities firing coal or oil; NO_x removal efficiencies in excess of 90 percent have been reported. In addition, high reductions have been achieved on full-scale operations with the catalyst located both upstream and downstream of the particulate control device. In contrast, refuse-fired boilers have encountered difficulties with the use of SCR for NO_x control, particularly because of catalyst fouling due to difficulties with particulate poisoning. In applications where the catalyst is upstream of the particulate removal

device, the relatively high particulate grain loading of the flue gas fouls the catalyst, rendering the bed ineffective for NO_x removal. The particulate may erode the catalyst and substrate material, or may poison or blind the catalyst.

SCR has been applied extensively on a experimental basis to oil, gas and coal fired boilers in Japan; has been tested on oil and gas fired boilers in the U.S.; and has been applied to coal-fired boilers in the U.S. on a limited basis. No refuse incinerator, however, in the United States has been equipped with SCR. In addition, no firm vendor guarantees have been offered. As a result, SCR cannot be considered as a viable control alternative under the guidelines established for determining BACT.

Selective Non-Catalytic Reduction (SNCR). The SNCR process is based on the gas phase homogeneous reaction between the NO_x in the flue gas and injected ammonia, NH_3, to produce gaseous nitrogen and water vapor. In general, NH_3 is injected into the hot flue gas by means of either air or steam as a carrier gas at a point in the boiler where the flue gases are at an optimum temperature. The following two reactions govern the success of the process:

(1) $NO + NH_3 + 1/4\ O_2 \rightarrow N_2 + 3/2\ H_2O$
(2) $NH_3 + 5/4\ O_2 \rightarrow NO + 3/2\ H_2O$

Flue gas temperature is critical to the success of the SNCR process and must be kept between 1600°F (871°C) and 1800°F (982°C), at the point where the NH_3 is injected. Above this temperature range the second reaction begins to dominate thus limiting the NO removal and possibly creating a counterproductive situation of generating more NO. If the flue gas temperature falls below 1600°F (871°C), the rate of both reactions slows down such that ammonia does not react but instead freely passes through the system (ammonia slippage) and into the ambient atmosphere. The ability of controlling the flue gas temperature within this range may be difficult since refuse composition varies and subsequently causes its heating value to fluctuate. Unexpected flue gas temperature shifts are possible in the boiler when fluctuations in the refuse heating value occurs and may even

require the use of supplemental fuel firing systems. Consequently, depending on the direction of the temperature shift, the Thermal DeNO$_x$ system could result in a NO$_x$ emission control trade-off of either a slippage of unreacted acrid ammonia vapor and/or an ammonium chloride cloud into the atmosphere or an increase in the quantity of NO$_x$ emitted.

Beyond the potential NH$_3$ reaction problems associated with not maintaining the flue gas temperature within this optimal range, several other technical difficulties may result from the SNCR technology. Residual NH$_3$ may react with SO$_3$ and HCl present in the flue gas to form various ammonium salts including: ammonium sulfate [$(NH_4)_2SO_4$]; ammonium bisulfate (NH_4HSO_4); and ammonium chloride. Depending on the type, these salts may be deposited in the boiler causing damage to boiler internals, removed in the air pollution control equipment, or exit the stack as a visible plume. Ammonium bisulfate salt has the potential to form in the boiler and, in the cooler sections, precipitate from the vapor phase as a very hygroscopic and sticky liquid. Since this salt has a relatively low melting point, it can contribute to significant fouling and corrosion in the lower temperature sections of the boiler (economizer). Ammonium sulfate also has the potential to form in the boiler, however, it is weakly acidic and does not appear to have boiler fouling characteristics. When formed, $(NH_4)_2SO_4$ precipitates from the gas phase as a dry solid powder with particle sizes in the range of 1 to 3 microns (Lyon, 1987). Consequently, $(NH_4)_2SO_4$ formation would result in a NO$_x$ emission control trade-off of increased particulate emissions. At approximately 250°F the remaining ammonia slippage which eludes the pollution control equipment will begin to react with gaseous HCl to form ammonium chloride (NH_4Cl) which is a dry, white salt that can contribute to a visible plume. In addition, a potential for cyanide formation from the chemical reaction between ammonia and hydrocarbons poses potentially worse NO$_x$ control trade-offs than those associated with ammonium salt formation (CARB, 1984).

Minimal operational experience exists on the potential effects of ammonia and its by-products on the boiler internals and the pollution control system of a refuse combustion facility. If formed, ammonium salts could corrode the scrubber and fabric filter internals and cause fouling or

increased fabric filter wear. An ammonium chloride plume has been reported on Japanese refuse combustion facilities and if formed, could violate state opacity regulations. A visible plume was photographed from the Kawasaki, Japan facility which combusts approximately 221 tpd of refuse from each of its three furnaces. At this facility the NO_x removal efficiency has been estimated to be between 40 and 60 percent.

Thermal DeNox Applications

The Thermal $DeNO_x$ system has primarily been applied to refuse combustion facilities in Japan where several systems exist--not in the U.S. The largest of the Japanese units features three Mitsubishi-Martin furnaces each rated at 300 tpd of refuse. Tests conducted on these units from 1976 to 1978 indicated that NO_x removal efficiencies of approximately 60 percent were possible but with ammonia breakthroughs of 30 ppmv (CARB, 1984). These efficiencies were accomplished by controlling furnace temperature and the ammonia to NO_x molar injection ratio.

In the U.S., California is the only state where Thermal DeNox has been tested and is operational. California's 300-tpd Commerce refuse combustion facility has been operating since February of 1987 with a Thermal $DeNO_x$ system that showed an average NO_x reduction in excess of 40 percent after compliance testing in June of 1987. The system, permitted as "Innovative Technology," appears to have had minimal operating problems with no reported NH_4Cl visible in the plume, even though some ammonia breakthrough does occur. Operation of the facility has been intermittent due to boiler problems but it is unknown as to whether they are attributable to operation of the $DeNO_x$ system. The facility appears to have minimal ammonia breakthrough which reduces the possibility of NH_4Cl formation but, this may be due to the fuel which consists exclusively of commercial waste. The waste stream at the Commerce facility has properties which are more homogeneous and probably have a lower nitrogen content than that found at other facilities which combust residential wastes. A more homogeneous fuel provides for stable combustion temperatures and enables the Thermal $DeNO_x$ system to operate within the specific operating temperature range or "window." The reaction of NO_x with NH_3 is maximized when the temperature

of the flue gas doesn't deviate from the specific range. Thus, NO_x removal is favored and NH_3 slippage is minimized. The facility is still operating under a temporary permit as of February 1988.

The two other California facilities which plan to incorporate the Thermal $DeNO_x$ system, Long Beach and Stanislaus County, will be the first in the U.S. to combust a more representative waste. These facilities will combust waste that is residential, commercial, and industrial. This less homogeneous waste stream, compared to the Commerce facility, will probably cause the furnace temperature to vary over a wider range resulting in a greater NH_3 breakthrough and less NO_x removal. Both of these facilities are located in only NO_2 non-attainment area in the U.S. and are permitted on the basis of meeting specific NO_x emission rates or concentrations and not NO_x removal efficiencies. Thus this level of control represents the lowest achievable emission rate (LAER) and not BACT. The Thermal $DeNo_x$ technology must always be operated, however, no performance guarantees were obtained from Exxon.

Summary

The City of Commerce, California is the only U.S. application where Thermal $DeNo_x$ has been tested and is operational. Two other systems have been permitted in California for facilities at Stanislaus County and Long Beach. Both facilities are presently being constructed and are expected to be operational in late 1988 or early in 1989. This technology has gained much attention in California due to the pressing need for NO_x control, since California has the only NO_2 non-attainment area in the U.S. Additionally a large fraction of California is not in attainment for ozone. Consequently, using this technology on California's present and future planned facilities may be considered as fulfilling EPA's requirement of implementing the lowest achievable emission rate (LAER) but not BACT.

Pasco County, Florida RRF - Risk and Cost Allocation

Pasco County is currently involved in a competitive selection process to contract with a full service company (FSC) to design, build and operate its proposed resource recovery facility. Such a contract between the County and the FSC would contain provisions for liquidated damages to the County should the facility not meet certain performance guarantees (e.g., annual waste processed, environmental emission limits, electrical generation, ash residue quality). In this type of procurement--if the Thermal $DeNo_x$ system was required--the FSC would include the cost of the Exxon system in its scope of work. The County would not contract directly with Exxon. All guarantees for facility performance, including NO_x emissions, would then become responsibility of the FSC.

The FSC would subsequently be required to accept all of the risks associated with Thermal $DeNo_x$ system operation which could affect the facility's performance. Some of these risks include:

- Boiler fouling and/or corrosion which could consequently lead to facility downtime for tube cleaning, repair or replacement.

- Environmental opacity violations from the possible formation of a visible NH_4Cl stack plume. This would lead to facility fines and/or downtime.

- Environmental emission violations for the release of ammonia which has an acrid odor or the formation of other pollutants such as cyanide. If the emissions are excessive, the facility could be fined or required to be shutdown for a certain period.

- Downtime of the Thermal $DeNO_x$ system would require the facility to be shutdown until it was repaired. This technology does not have long term operating experience and, it is anticipated that breakdowns will occur.

All of these risks could result in facility downtime which could result in the FSC's failure to meet performance guarantees. If a Thermal $DeNO_x$ system was required as part of the FSC's scope of work, these risks would be evaluated and reflected in the cost of the system to the County.

To accurately represent the cost analysis conducted for the Thermal $DeNO_x$ system, additional contingencies have been added to the information provided by Exxon. These contingencies cover various operating parameters and costs associated with risk of failing to meet performance guarantees. These adjusted costs represent those which would be passed onto the County by the FSC, and include:

Item	Cost Adjustment
Ammonia consumption.	Based on a molar injection stoichiometry of 2.75 (NH_3 to NO_x).
Capital costs.	Increase Exxon capital cost by 10 percent.

Item	Cost Adjustment
Facility downtime associated with possible opacity and environmental emission violations, and equipment breakdowns.	Facility availability is decreased by a 10 day shutdown per year. Cost of this item is calculated as lost energy revenues.
Power consumption.	Cost of electricity to power air compressors and miscellaneous motors.
Increased maintenance on the boiler and possibly for the dry scrubber and baghouse.	Labor and material cost of $50,000 per year.
Labor and material for maintenance associated with the $DeNO_x$ system.	Approximately 2 percent of the capital cost per year.

The industry standard for facility availability, 85 percent, was used in the cost analysis for the dry scrubber and the baghouse. However, to analyze the Thermal DeNO$_x$ system, a reduced facility availability was used because it is believed that 10 additional days of unscheduled downtime will occur. The 10-day downtime represents approximately 2.5 percent of the annual operating period. Therefore, the reduced facility availability is 82.5 percent.

Table 4-15 illustrates the various annual operating costs for the Thermal DeNO$_x$ system. Table 4-16 shows the cost per ton of NO$_x$ removed. Table 4-17 shows the maximum annual ground level concentrations (GLCs) for the NO$_x$ control alternatives. The table indicates that the proposed control alternatives (i.e., proper furnace design and operation vs. Thermal DeNO$_x$) have GLCs of 1.03 and 0.62 ug/m^3, respectively. These are both below the FAAQS for NO$_x$ at 100 ug/m^3.

Therefore, because the reduction in the GLC emissions associated with Thermal DeNO$_x$ does not result in a significant air quality benefit, its implementation offers minimal environmental benefit. Economically, the use of Thermal DeNO$_x$ would increase the facility's tipping fee by approximately $3/ton and cost an estimated $2,478/ton of NO$_x$ removed (based on a 40 percent NO$_x$ reduction). This economic impact is 248 percent greater than the $1,000/ton removed guideline given by DER for use in evaluating the cost benefits for BACT. Thus, the application of the Thermal DeNO$_x$ system does not seem warranted and proper furnace design and operation is proposed as BACT for the Pasco County RRF.

TABLE 4-15

CAPITAL AND OPERATION/MAINTENANCE COSTS PER
NO_x ALTERNATIVE CONTROL STRATEGIES

	CAPITAL COSTS (IN 1000's $)			POWER REQUIREMENTS AND ANNUAL COSTS (IN 1000's $)				
Alternative Control Strategy	Capital[1] Cost	Annualized[2] Capital Cost	Power[3] Cost	Maintenance[4] & Labor Material Cost	System[5] Operating Labor	Ammonia[6] Cost	Lost[8] Energy Revenue	Total
Furnace Design & Proper Operation	0	0	0	0	0	0	0	0
Selective[7] Non-Catalytic Reduction (SNCR)	2,655	271	102	103	20	354	254	1,104

(1) Includes Bond Burden.
(2) Annualized capital cost assume 20 year plant life and interest rate equals 8% (capital recovery factor = 0.1019).
(3) Power costs assume plant operation for an entire year with 82.5% availability. Power cost = $0.04/KWh.
(4) Maintenance assumed to be 2.0 percent of capital cost plus $50,000/yr for increased boiler maintenance.
(5) System operating labor based on 1/2 man-year required at $20,000/yr (includes benefits).
(6) Included cost of ammonia based on $450/ton NH_3 (Delivered).
(7) SNCR system used in this analysis is Exxon Thermal $DeNO_x$.
(8) Downtime assumed as 10 days per year. Calculated as (10 days/yr x 120 tons waste/day x 530 KWh/ton x $0.04/KWh.

TABLE 4-16

COST COMPARISON OF NO_x ALTERNATIVE CONTROL STRATEGIES

Alternative Control Strategy	NO_x Emission Rate, TPY [4]	NO_x Removal Efficiency, %	Incremental Controlled NO_x Emissions, TPY [4]	Annual Control Costs 1000's $/yr [1]	Control Costs $/ton NO_x Controlled [1]	Tipping Fee Increase $/ton [2]
Furnace Design and Proper Operation	1,351	0	-	0	0	0
Selective [3] Non-Catalytic Reduction (SNCR)	811	40	540	1,104	2,478	3.01

(1) Control Costs ($/ton of NO_x Controlled) equals the Annual Control Costs (1000's $/yr) divided by the Controlled NO_x Emissions (TPY), i.e., 1,104 x 10^3 /(540 tons x 0.825) = 2,478/ton NO_x controlled.

(2) Tipping Fee Increase ($/ton) equals the Annual Control Costs (1000's $/yr) divided by the Tons of Waste Processed per year with 82.5% availability (1,200 TPD x 365 days/yr x 0.825 = 367,350 TPY).

(3) SNCR System used in this analysis is the Exxon Thermal DeNO_x System.

(4) Potential to emit during an entire 365 day-year.

TABLE 4-17

COMPARISONS OF NO_x CONCENTRATIONS FOR
ALTERNATIVE NO_x CONTROL TECHNOLOGIES TO FAAQS

Control Alternative	Estimated Maximum Annual Impact (ug/m^3)	Percent of FAAQS %
Furnace Design and Proper Operation	1.03	1.03
Selective Non-Catalytic Reduction (SNCR)[1]	0.62	0.62
Regulated Concentrations		
Annual		
FAAQS = 100 ug/m^3		
PSD Significance Level = 1 ug/m^3		

[1] SNCR System used in this analysis is the Exxon Thermal $DeNO_x$ System.

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET
ATLANTA, GEORGIA 30365

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

AIR-4

Ms. Margaret V. Janes
Bureau of Air Quality Management
Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
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PN
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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

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FEB 4 1988

BAQM

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Tallahassee, Florida 32399-2400

RE: Pasco County Resource Recovery Facility (PSD-FL-127)

Dear Ms. Janes:

This is to acknowledge receipt of the above-mentioned applicant's responses to the Florida Department of Environmental Regulation (DER). After reviewing the documents, we would like to comment on the applicant's response regarding the possible installation of NO_x controls.

In the submitted documents, the applicant rules out the option of installing the mentioned Exxon deNO_x system. The first reason given is that the system's incremental cost of $1,302 per ton of NO_x removed exceeds the DER's econonmic guideline for BACT cost benefits of $1,000 per ton of removal. The other reason given is that the slight improvemnt of modeled NO_x incremental consumption as a result of installing the system does not justify the additional capital expenditures. In order to comment more thoroughly on these statements, we consulted with EPA Headquarters on this matter.

Regarding the incremental cost, it was made known to us that Headquarters is preparing a study document on the subject of establishing NO_x increments and NO_x reduction controls. From the study's preliminary surveys on the general incremental costs associated with the installation of these controls, the applicant's $1,302 appears to be reasonable and further consideration is warranted.

On the point raised by the applicant on the modeled NO_x incremental consumption, the applicant should know that a BACT determination is done separately from the air quality modeling. Air quality modeling is used only to ensure that a determined BACT will not violate any ambient quality standards. It does not in any way play a part in justifying the economic feasibility of relaxing a higher level BACT. Therefore, unless the applicant can demonstrate that it is economically and/or technologically impossible to implement a higher level of control, the higher level control should be given further consideration.

Thank you for the opportunity for providing our input. If you have additional information or comments, please contact me or Gary Ng of my staff at (404) 347-2864.

Sincerely yours,

Bruce P. Miller

Bruce P. Miller, Chief
Air Programs Branch
Air, Pesticides, and Toxics
Management Division

Copied. Pradeep Raval
Tom Rogers
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CDM
environmental engineers, scientists, planners, & management consultants

CAMP DRESSER & McKEE INC.

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January 12, 1988

DER
JAN 18, 1988
BAQM

Mr. Hamilton S. Oven, Jr.
Administrator, Siting Coordination Section
FLorida Department of Environmental Regulation
Twin Towers Office Building
2500 Blair Stone Road
Tallahassee, FL 32399-2400

RE: Responses to Comments from DER on the Power Plant Siting Application for the Pasco County Resource Recovery Facility

Dear Mr. Oven:

Attached are the responses to the comments made by the Florida Department of Environmental Regulation (DER) in the letter dated December 22, 1987 (also attached). The responses follow the order in which the comments were made. These responses are clarifications to Volume III of the Power Plant Siting Application (dated November 6, 1987) for Pasco County Resource Recovery Facility. Camp Dresser & McKee Inc. is the environmental and engineering consultant for the Pasco County, Florida Solid Waste Resource Recovery Project and has prepared the responses on behalf of Pasco County and Mr. George Ellsworth.

It is our understanding that these comments reflect the current guidance given by EPA Region IV as stated in their letter dated December 18, 1987 and a letter from EPA in Washington, D.C. dated December 1, 1987. For purposes of PSD review, the application is deemed complete as of December 1, 1987 in accordance with 40 CFR 52.21(b)(22). All other aspects of the application are understood to be deemed sufficient in accordance with Section 17-17.081 of the Florida Administrative Code.

It is our intent to satisfy the requirements of DER. If any further clarifications are required, please let us know.

Sincerely,

CAMP DRESSER & McKEE INC.

Raymond C. Porter /for

Daniel E. Strobridge
Project Manager

Attachments

cc: Barry Andrews, DER Bureau of Air Quality Management
Margaret V. Janes, DER Bureau of Air Quality Management
Bruce Miller, EPA Region IV, Air Programs Branch
Wayne J. Aronson, EPA Region IV, Air Programs Branch
George Ellsworth, Pasco County, Resource Recovery Manager

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ATTACHMENT

RESPONSES TO COMMENTS FROM THE DER ON THE POWER PLANT SITING APPLICATION FOR THE PASCO COUNTY RESOURCE RECOVERY FACILITY

1. Tables 1 and 2, attached, include the costs for the selective non-catalytic reduction (SNCR) alternative for the control of NOx. This is the only control technology other than furnace design and proper operation that has been applied to resource recovery facilities. The SNCR system included is the Thermal DeNOx System designed by Exxon which utilizes ammonia (NH_3) as the reactive reagent. The reactions and system are discussed in Volume III of the permit application on pages 4-57 to 4-59. The Thermal DeNOx System is estimated to have a capital cost of $2,414,000 and an annual operating cost of $703,000/year. The ammonia can be injected into the boiler with a carrier gas of either steam or compressed air, with the compressed air system being the most economical. The Thermal DeNOx System is designed to reduce NOx emissions by forty percent, but the removal efficiency has not been guaranteed by Exxon on refuse fired facilities.

   These costs are based only on a single vendor's quotation. Exxon is not an operator of resource recovery facilities. The Thermal DeNox System has been operating at only one facility for a relatively short period of time. Therefore, capital, operation and maintenance cost may not be fully quantified. Although no additional costs for controlling NOx emissions by furnace design and proper operation are included in Table 1, designing an efficient furnace and operating the combustion controllers, grate or combustor system, temperature monitors and auxilary burners do have associated costs which will be included in the total cost of the facility. It is not possible to differentiate what portion of these costs are associated with the control of NOx, CO or VOC emissions.

TABLE 1

COST COMPARISON OF NOx ALTERNATIVE CONTROL STRATEGIES

Alternative Control Strategy	NOx Emission Rate, TPY	NOx Removal Efficiency, %	Incremental Controlled NOx Emissions, TPY	Annual Control Costs 1000's $/yr[1]	Control Costs $/ton NOx Controlled[1]	Tipping Fee Increase $/ton[2]
Furnace Design and Proper Operation	1352	0	---	0	0	0
Selective Non-Catalytic Reduction (SNCR)[3]	811	40	540	703	1302	1.89

(1) Control Costs ($/ton of NOx Controlled) equals the Annual Control Costs (1000's $/yr) divided by the Controlled NOx Emissions (TPY), i.e. $703 x 10^3 / 540 tons = $1302/ton NOx controlled.

(2) Tipping Fee Increase ($/ton) equals the Annual Control Costs (1000's $/yr) divided by the Tons of Waste Processed per year with 85% availability (1200 TPD x 365 days/yr c 0.85 = 372,300 TPY).

(3) SNCR System used in this analysis is the Exxon Thermal DeNox System.

TABLE 2

CAPITAL AND OPERATORS/MAINTENANCE COSTS FOR NOx ALTERNATIVE CONTROL STRATEGIES

	CAPITAL COSTS (IN 1000'S $)		POWER REQUIREMENTS AND ANNUAL O&M COSTS (IN 1000'S $)					
Alternative Control Strategy	Capital[1] Cost	Annualized[2] Capital Cost	Power (KW)	Power[3] Cost	Labor[4] Cost	Maintenance Materials & Supplies[5]	Special Costs	Total Annual Cost
Furnace Design and Proper Operation	0	0	0	0	0	0	0	0
Selective Non-Catalytic Reduction (SNCR)[7]	2,414	246	180	54	30	169[6]	24	$703

(1) Includes Bond Burden.

(2) Annualized capital costs assume 20 year plant life and interest rate equals 8% (capital recovery factor = 0.1019).

(3) Power costs assume plant operation for an entire year with 85% availability. Power cost = $0.04/KWh.

(4) Labor costs assume base 1 man-year required at $30,000/yr.

(5) Maintenance assumed to be 1.0 percent of capital cost.

(6) Includes cost of ammonia based on $250/ton NH_3.

(7) SNCR System used in this analysis is the Exxon Thermal DeNox System.

The implementation of SNCR in the U.S. has occurred only in California where the ambient air is not in attainment of the National Ambient Air Quality Standards (NAAQS) for NO_2. The only operating Thermal DeNOx System, installed at the Commerce RRF, was permitted as "Innovative Technology" and has been operating for less than a year. The requirement for SNCR at the Stanislaus facility, which is still under construction, represents LAER and not BACT. Thus, the long-term operation of a SNCR on resource recovery facilities has not been demonstrated in the U.S.

Table 3 contains the maximum annual ground level concentrations for the NOx alternatives. Table 1 shows that the two alternatives, (1) furnace design and proper operation and (2) SNCR, represent 1.1 percent and 0.66 percent, respectively of the FAAQS for NOx (100 ug/m^3). Because the reduction in emissions does not result in a significant air quality benefit, implementation of SNCR is not warranted. The economic impact ($1,302 per ton of NOx removed) is greater than the $1,000/ton removed guideline, as stated in conversations with DER, for evaluating the cost benefits for BACT. Thus, furnace design and proper operation is selected as BACT for the Pasco County RRF.

2. Emissions of cadmium, chromium, copper, manganese, nickel and polycyclic organic matter are not PSD regulated pollutants. However, the environmental portion of the BACT analysis for PSD regulated pollutants may consider potential reductions in nonregulated pollutants.

The trace metals, cadmium, chromium, copper, manganese and nickel are associated with the particulate portion of emissions from a resource recovery facility. The proposed air pollution control includes a dry scrubber and a baghouse designed to achieve 0.015 grains per dry standard cubic foot corrected to 12 percent CO_2. The dry scrubber, through the process of evaporating the water in the lime slurry, cools the flue gas, facilitating the condensation of vaporous metal emissions to the particulate phase. The baghouse effectively reduces total and fine particulate emissions such that particulate borne trace metal emissions would also be minimized.

TABLE 3

COMPARISON OF NOx CONCENTRATIONS FOR ALTERNATIVE NOx CONTROL TECHNOLOGIES TO FAAQS

Control Alternative	Estimated Maximum Annual Impact (ug/m^3)	Percent of FAAQS (%)
Furnace Design and Proper Operation	1.1	1.1
Selective Non-Catalytic Reduction (SNCR)(1)	0.66	0.66
Regulated Concentrations		
Annual		
FAAQS = 100 ug/m^3		
PSD Significance Level = 1 ug/m^3		

(1) SNCR System used in this analysis is the Exxon Thermal DeNox System.

Polycyclic organic matter (POM) is a class of compounds characterized by carbon atoms arranged in multiple ringed structures. These compounds are a trace component of the volatile organic compound (VOC) emissions from a resource recovery facility. To minimize emissions of VOC, dioxins and furans and POM, the facility will employ automatic combustion controls, overfire and underfire air systems and auxiliary burners. Thus, the emission limit for VOC emissions effectively reduces trace organic emissions.

3. Each grate (or combustor), furnace and boiler system will be designed to combust 300 tons per day of reference waste with an average higher heating value (HHV) of 4,800 Btu per pound for a heat release rate of 120 million Btu per hour per unit (480 million Btu per hour for the facility). The boiler system works most efficiently when the heat release within the furnace is kept within 80 to 100 percent of the design heat release rate. To maintain efficient boiler operation, a balance must be made between waste throughput and heat content. If the heat content of the waste is greater than 4,800 Btu per pound the waste is processed at a slower rate. If the heat content is lower than 4,800 Btu per pound the waste is processed at a faster rate. For short periods of time (less than three hours), the maximum heat release is not expected to exceed the design heat release rate by more than 10 percent or 132 million Btu per hour per unit (528 million Btu per hour for the facility). This would be equivalent to firing 330 tons per day of waste with a heat content of 4,800 Btu per pound or 300 tons per day of waste with a heat content of 5,280 Btu per pound.

4. Once the facility is constructed, compliance testing will be conducted in accordance with FAC 17-2.700 and 40 CFR 60. The sampling procedures will be submitted for Florida DER review and approval prior to conducting the tests. The pollutants for which compliance with emission limitations must be demonstrated are listed on Table 4. The emissions reflect the short term operating release rates used in the air quality dispersion analysis. The operating condition of 1,200 tpd of 5,000 Btu/lb waste has a pollutant

TABLE 4

POLLUTANT EMISSIONS RATES

Pollutant	Averaging Time	Controlled Concentrations at Stack Top[3]
Particulate Matter (TSP or PM_{10})	24-Hour	0.0156 gr/dscf at 12% CO_2
Carbon Monoxide	8-Hour	104 ppmdv at 7% O_2
Nitrogen Oxides	3-Hour	417 ppmdv at 7% O_2
Sulfur Dioxide	3-Hour	104 ppmdv at 7% O_2
Volatile Organic Compounds (as CH_4)	3-Hour	38.8 ppmdv at 7% O_2
Lead	24-Hour	7.82×10^{-4} gr/dscf at 12% CO_2
Beryllium	24-hour	6.56×10^{-8} gr/dscf at 12% CO_2
Mercury	24-Hour	4.38×10^{-6} gr/dscf at 12% CO_2
Inorganic Arsenic	24-Hour	7.09×10^{-4} gr/dscf at 12% CO_2
Fluorides	3-Hour	1.20 ppmdv at 7% O_2
Sulfuric Acid Mist	--	(1)
Hydrogen Chloride[2]	3-Hour	104 ppmdv at 7% O_2
Dioxin[2] (as 2,3,7,8-TCDD toxics equivalent)	24 Hour	3.92 ng/Nm^3 at 12% CO_2

(1) EPA Region IV has determined that there is no reliable testing method for this pollutant.

(2) Not a PSD regulated pollutant.

(3) Concentrations represent short-term operating release rates as modeled in the air quality analysis.

emission rate 1.042 times that of the design operating condition. Gaseous pollutants are expressed in units of parts per million on a dry volume basis corrected to 7 percent oxygen. Particulate borne pollutants are expressed in units of grains per dry standard cubic foot corrected to 12 percent carbon dioxide.

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

December 22, 1987

George Ellsworth
Resource Recovery Manager
7536 State Street
New Port Richey, Florida 33553

Dear Mr. Ellsworth:

The Florida Department of Environmental Regulation has reviewed the power plant siting application for sufficiency in accordance with section 17-17.081, Florida Administrative Code. The following areas need to be addressed either in Section 3.4.3 or Volume III of the application:

1. It will be necessary to establish BACT for nitrogen oxides using the top down approach. (According to EPA directives, BACT is now being evaluated from a top down approach. In using this approach, BACT is initiated using LAER as a starting point. BACT is then determined based on the economic, environmental, and energy impacts of each technology associated with LAER. If the control/emission rate associated with LAER is not justified by these constraints, a lesser degree of control is selected and the analysis is repeated until the level of control that is justified is reached.)

2. All toxic air pollutants need to be addressed with respect to the proposed control technology. For municipal waste combustors the toxic air pollutants are identified in the publications entitled, "Compiling Air Toxic Emission Inventories," EPA-450/4-86-010 and "Control Technologies for Hazardous Air Pollutants," EPA-625/6-86-014. In accordance with these publications, the pollutants cadmium, chromium, copper, manganese, nickel and polycyclic organic matter need to be addressed.

3. Will the heat release from the project at its maximum capacity exceed 500 MMBtu/hr (e.g. 1320 tons/day refuse having a heat content of 5000 Btu/lb)?

4. How does the County propose to show compliance with emission limitations for all the pollutants emitted in greater than significant quantities (re: Table 2-1)? What will be the emission concentrations for the above mentioned pollutants on a dry basis and corrected to 7% O_2 or 12% CO_2 (apart from the ones already submitted in the application).

If you have any questions concerning these requirements you may wish to contact Barry Andrews in the Bureau of Air Quality Management at (904) 488-1344.

Sincerely yours

Hamilton S. Oven, Jr.

Hamilton S. Oven, Jr. P.E.
Administrator, Siting
Coordination Section

HSO

cc: Diane Tremor
Richard Donelan
All parties

Pasco File

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

Interoffice Memorandum

For Routing To Other Than The Addressee	
To	Location
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From	Date

TO: Hamilton Oven

FROM: Clair Fancy

DATE: December 22, 1987

SUBJ: Pasco County SWRRF, Sufficiency Review

In accordance with recent EPA policy developments regarding Best Available Control Technology (BACT) determinations and municipal waste combustors, the following areas need to be addressed:

1) Top down BACT: BACT is now being evaluated from a top down approach. In using this approach, BACT is initiated using LAER as a starting point. BACT is then determined based on the economic, environmental, and energy impacts of each control alternative beginning with the emission level/control technology associated with LAER. If the control/emission rate associated with LAER is not justified by these constraints, a lesser degree of control is selected and the analysis is repeated until the level of control that is justified is reached.

   It has been determined that the level of control proposed for particulate and acid gas control (dry scrubber - baghouse) is consistent with the level of control that would be justified using the top down approach. However, it will be necessary to establish BACT for nitrogen oxides, using the top down approach.

2) All toxic air pollutants need to be addressed with respect to the proposed control technology. For municipal waste combustors the toxic air pollutants are identified in the publications entitled, "Compiling Air Toxics Emission Inventories," EPA-450/4-86-010 and "Control Technologies for Hazardous Air Pollutants," EPA-625/6-86-014. In accordance with these publications, the pollutants cadmium, chromium, copper, manganese, nickel and polycyclic organic matter need to be addressed.

3) Will the heat release from the project at it's maximum capacity, exceed 500 MMBtu/hr (e.g. 1320 tons/day refuse having heat content of 5000 Btu/lb)?

4) How does the County propose to show compliance with emission limitations for all the pollutants emitted in greater than significant quantities (re: Table 2-1)? What will be the emission concentrations for the above mentioned pollutants on dry basis and corrected to 7% O_2 or 12% CO_2 (apart from ones already submitted in the application).

CHF/PR/s

cc: T. Rogers
B. Andrews
P. Raval

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Ms. Margaret V. Janes, Planner
Bureau of Air Quality Management
Florida DER
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2600 Blair ~~Stone~~ Road
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PM
Dec. 18, 1987
Atlanta, GA

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BAQM

Ms. Margaret V. Janes, Planner
Bureau of Air Quality Management
Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Re: Pasco County Resource Recovery Facility (PSD-FL-127)

Dear Ms. Janes:

This is to acknowledge receipt of your December 2, 1987, PSD application from the above-mentioned source. After reviewing the application, I would like to offer the following comments with regard to the applicant's BACT determination.

With regard to the BACT determination, we concur with the applicant's proposed usage of a dry scrubber/baghouse control system that will limit the TSP emission concentration to 0.015 gr/dscf and at the same time provide a 70% control on the SO_2 emissions (i.e., 74.8 ppmv at the most) and 90% control on acid gases and dioxins. However, the applicant did not perform a cost analysis for the control of NO_x. A qualitative description of the BACT determination was all that was given. A more appropriate BACT determination would include a cost analysis on several control options in a "top-down" fashion. For your information, this "top-down" BACT procedure became effective as of December 1, 1987, with the publication of the EPA Potter memorandum entitled, "Improving New Source Review (NSR) Implementation" (copy enclosed). Efforts are now being made here at Region IV to inform all of our State/local agencies concerning this memorandum. Meanwhile, please inform Pasco County and other future applicants with regard to the "top-down" policy.

Thank you for the opportunity to provide our comments. If you have any questions, please call me or Gary Ng of my staff at (404) 347-2864.

Sincerely yours,

Wayne J. Aronson / acting for

Bruce P. Miller, Chief
Air Programs Branch
Air, Pesticides, and Toxics
Management Division

Enclosure

Copied: CHFIBT
Reading Book
Gary Ng
Tom Rogers
12-23-87

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

DEC 1 1987

MEMORANDUM

SUBJECT: Improving New Source Review (NSR) Implementation

FROM: J. Craig Potter
Assistant Administrator
for Air and Radiation (ANR-443)

TO: Regional Administrator
Regions I-X

On June 27, 1986, I established a special task force to address growing concerns about the consistency and certainty of permits issued under the Clean Air Act's prevention of significant deterioration and nonattainment area NSR programs. Based on the findings and recommendations of the task force, I am today establishing certain program initiatives designed to improve the timeliness, certainty, and effectiveness of these programs.

A great deal of effort will be required to overcome the problems which have developed, but it is my belief that these problems, with your full cooperation and assistance, can be resolved so that these essential air management programs can fulfill their intended roles. Therefore, I urge each of you to provide the maximum priority and resource commitments available to the task.

The outstanding concern we now face in these programs is inadequate implementation. The Office of Air and Radiation intends to apply its resource commitments so as to enhance its ability to provide technical support and guidance, training, workshops, auditing, and enforcement support to the Regions and delegated programs. The Regional Offices must make a corresponding resource commitment for these efforts to succeed. Accordingly, I am requesting that you initiate a self-evaluation of current NSR activities and, to the extent necessary, refocus Regional attention on these programs in an effort to improve and enhance NSR program implementation.

To ensure that we maintain the flexibility to make this effort a dynamic one, capable of sensing and adjusting to the needs of the program, I intend to establish an informal group of our colleagues to report to me on progress in implementing the initiatives discussed below. The mission of the group is to provide the feedback necessary to maximize the effectiveness of NSR implementation and to make NSR reflective of air program needs.

The following is a list of the specific program initiatives I am hereby instituting to bring about improvements in NSR implementation:

Tracking Permit Actions--Initially and until such time as permit quality can be assured, I am requiring that each Regional Office establish (if not already in place) a program to ensure a timely and comprehensive review of all State and local agency-issued major source permits and certain minor source permits. Implementation of the program will be made part of the Regional Office Management System and will require the "real time" exchange and review of information between the Regional Office and the State and local agencies when a key milestone is reached during the permitting process.

Effective communication between the permitting agency and the Regional Office is essential to improving program implementation. Therefore, the Regional Offices will need to ensure that State and local permitting agencies follow certain notification procedures such as:

- Notify the Regional Office and other affected parties (e.g., the Federal land manager if Class I areas are impacted), within a reasonable time, of the receipt of a new major source permit application. This can take the form of a complete copy of the application itself or a brief description of the proposed project. Notification can be made as each application is received or the information may be submitted to the Regional Office in a periodic report.

- Submit to the Regional Office a complete public notification package at the beginning of the public notice period. The package must contain the public notice language, the proposed permit, and a technical analysis demonstrating how the proposed project complies with the technical review requirements of the regulations [e.g., best available control technology (BACT) or lowest achievable emission rate (LAER), air quality impacts or offsets].

- Submit to the Regional Office a copy of the final preconstruction permit when issued, including a response to any appropriate comments submitted during the public comment period.

- Submit to the Regional Office a copy of the operating permit when issued.

Likewise, when informed of a permit action, the Regional Office is responsible for the timely review of the information, specifically:

- Screen incoming information on permit applications for potential issues or concerns and, if warranted, communicate them to the permitting agency.

- Perform a timely and comprehensive review of the public notice package and, if warranted, provide comment during the public comment period. To aid in this task, I have directed the Office of Air Quality

Planning and Standards (OAQPS) to start work on the development of a permit review checklist for use by the Regional Office during the public comment period. The checklist will also be useful to State and local agencies as a tool for self-audit and to understand what the Environmental Protection Agency (EPA) emphasizes when reviewing a proposed permit.

- Review any response to comments and the final permit to ensure that any outstanding concerns have been resolved satisfactorily.

- Review the permit to operate to ensure that it is consistent with the preconstruction permit.

- Take prompt and appropriate action to deter the issuance or use of permits which fail to meet minimal Federal requirements. I have directed OAQPS to work with the Office of General Counsel and the Office of Enforcement and Compliance Monitoring to develop guidance for the Regional Offices on the appropriate legal mechanisms and procedures for handling deficient permit actions.

- To the extent practicable, prior to permit issuance, review potential minor permit actions which exempt an otherwise major source or modification from a major review (e.g.,"synthetic" minor sources, major sources netting out of review, and 99.9 or 249.9 tons per year sources).

The most critical element of these initiatives is the Regional Office review of proposed permit actions during the public comment period. The FY 1985 national air audit showed widespread serious permit deficiencies, many of which could have been corrected without interfering with State and local agency processing if dealt with by EPA during the public comment period. By uniformly reviewing all major source permit actions during the comment period, EPA is able to address deficient reviews or permits before the final permit is issued. This not only promotes more consistency in the permitting process among the States, but also provides the highest degree of certainty to the applicant that the permit will not be challenged by EPA at a later date. Moreover, if the permit is not reviewed and commented on prior to issuance, the possibility of successfully challenging the action is greatly diminished, as is the opportunity to improve the enforceability of the permit.

BACT Determinations--Of all the NSR processes, BACT (and LAER) determinations are perhaps the most misunderstood and the least correctly applied. The BACT alternatives, if presented by the applicant at all, are often poorly documented or biased to achieve the decision the applicant desires.

To bring consistency to the BACT process, I have authorized OAQPS to proceed with developing specific guidance on the use of the "top-down" approach to BACT. The first step in this approach is to determine, for the emission source in question, the most stringent control available for a similar or identical source or source category. If it can be shown that this level of control is technically or economically infeasible for

the source in question, then the next most stringent level of control is determined and similarly evaluated. This process continues until the BACT level under consideration cannot be eliminated by any substantial or unique technical, environmental, or economic objections. Thus, the "top-down" approach shifts the burden of proof to the applicant to justify why the proposed source is unable to apply the best technology available. It also differs from other processes in that it requires the applicant to analyze a control technology only if the applicant opposes that level of control; the other processes required a full analysis of all possible types and levels of control above the baseline case.

The "top-down" approach is essentially already required for municipal waste combustors pursuant to the June 22, 1987, Administrator's remand to Region IX of the H-Power BACT decision and the OAQPS June 26, 1987, "Operational Guidance on Control Technology for New and Modified Municipal Waste Combustors (MWC's)." It is also currently being successfully implemented by many permitting agencies and some of the Regional Offices for all sources. I have therefore determined that it should be adopted across the board.

In the interim, while OAQPS develops specific guidance on the "top-down" process, I am requesting the Regional Office to apply it to their BACT determinations and to strongly encourage State and local agencies to do likewise. Moreover, when a State agency proposes as BACT a level of control that appears to be inconsistent with the "top-down" concept, such as failure to adequately consider the more stringent control options, the Regional Office is to provide comment to that agency. A final BACT determination which still fails to reflect adequate consideration of the factors that would have been relevant using a "top-down" type of analysis shall be considered deficient by EPA.

Training--No formal training workshops specific to NSR have been held since 1980. Many State and local agencies, as well as the Regional Offices, have experienced a high rate of NSR personnel turnover since then. Many of the basic problems that are occurring in NSR implementation can be traced to the lack of comprehensive, continuing training for new Regional Office and State agency personnel.

To rectify this situation, in FY 1988, OAQPS will work on developing materials for a comprehensive training program in the form of Regional workshops to be conducted in FY 1989.

Commencing in FY 1989, biannual Headquarters-sponsored NSR workshops will be conducted at each Regional Office with State and local agencies attendance encouraged. Workshop topics will cover the NSR rules and policy, BACT and LAER determinations, effective permit writing, how to review a proposed permit and audit a permit file, and other program areas as needed. Appropriately trained Regional staff are to then hold these workshops at their respective State agencies. The NSR experts from Headquarters or NSR experts from other Regions will be available to assist.

In addition, Regional Offices should reserve the funds necessary to send at least one EPA staff representative to the NSR workshops (for EPA only) held semiannually at Denver, Colorado (February), and Southern Pines, North Carolina (July). Attendance at these workshops plays a vital role in keeping the Regions up to date on program implementation and new and emerging policy.

Policy and Guidance--Continuous litigation and regulatory changes have combined with the complexity of NSR rules to create a log jam of the policy and guidance needed to help interpret and effectively apply these rules. Therefore, I am directing that in FY 1989 OAQPS dedicate at least one staff person to ensuring a timely response to policy and guidance requests. In the interim, I intend to continue OAQPS's efforts to compile and organize NSR reference and guidance materials, such as the NSR electronic bulletin board.

I realize that the initiatives discussed above constitute only the first steps of a continuing process to address concerns and needs relating to NSR program implementation. In recognition of the possible need to maintain flexibility in managing and improving the NSR process I will, as indicated earlier, establish a group to monitor our progress under this new policy. The group will be comprised of representatives from EPA Headquarters and Regional Offices and we will consult with State and local agency officials as part of our effort to obtain timely feedback as we implement these initiatives.

Additional specific guidance on improvements in the program areas discussed above will be issued in the near future. In the meantime, each Regional Office is directed to work closely with its State and local agencies to ensure that all aspects of the NSR permit programs comply with all applicable State and Federal program requirements.

Your comments and suggestions are welcome. Please direct them to Gary McCutchen, Chief, New Source Review Section, MD-15, Research Triangle Park, North Carolina 27711 (FTS 629-5592).

cc: Air Division Directors, Regions I-X