STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

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TALLAHASSEE, FLORIDA 32301-8241

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May 30, 1986

Mr. Bruce P. Miller
Acting Chief
Air Programs Branch
U.S. EPA, Region IV
345 Courtland Street,. N.E.
Atlanta, Georgia 30365

Dear Mr. Miller:

RE: Final Determination - Hillsborough County Resource Recovery Facility, PSD-FL-104

Enclosed please find the department's response to your comments on the Final Determination for the subject project. We recommend that the applicant be granted Authority to Construct, subject to the conditions in the Final Determination as amended.

Sincerely,

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

CHF/pa

Enclosure

cc: David S. Dee
Bill Thomas
Iwan Choronenko

Final Determination

Hillsborough County Energy Recovery Facility's Prevention of Significant Deterioration permit application has been reviewed by the Florida Bureau of Air Quality Management. Public notice of the Intent to Issue the permit was published in the Tampa Tribune on April 6, 1986.

Copies of the preliminary determination have been available for public inspection at the Florida Department of Environmental Regulation's Southwest District office in Tampa and the Bureau of Air Quality Management office in Tallahassee.

These comments on the preliminary determination and draft permit were received from the Unites States Environmental Protection Agency, Region IV:

1. Does the state NSPS (17-2.660) apply? Yes, it does apply. However, this section was adopted by reference and because this is a federal PSD permit, we do not feel that this cite is necessary.

2. The 3-hour SO_2 limit is not necessarily BACT. The mention of this limit as BACT has been stricken.

3. In Condition (11), the (2) should be (3). Condition (11) has been changed to reflect this.

4. Wording change on page 28: "During each" has been substituted for "with the" in paragraph b.(1).

5. Mercury emission rate in Table II-1: This is the rate proposed by the county at the time of the application. BACT for mercury was determined to be less than the county's proposal. No change is needed to Table II-1.

6. Scrubber condition: Condition 12 has been added to the permit. This condition requires that space for a scrubber be provided should the future installation of a scrubber be necessary.

7. Lead limit: The county proposed a lead limit of 0.048 lb/ton when they applied for the permit. After negotiating with the EPA, the county accepted a limit of 0.020 lb/ton. The statement on page 7 of the preliminary determination identifies the limits as "the applicant has proposed". For this reason, this lead limit will not be changed.

The Bureau of Air Quality recommends that the PSD permit be issued with the changes discussed above.

Final Determination

and Permit

Hillsborough County Energy Recovery Facility

Hillsborough County, Florida

PSD-FL-104

Prevention of Significant Deterioration

40 CFR 52.21

Review performed by Florida Department of Environmental Regulation

May 21, 1986

I. INTRODUCTION

Pursuant to Section 403.505, Florida Statutes, Hillsborough County applied to the Florida Department of Environmental Regulation (DER) in August 1984 for certification of a steam electric generating, solid waste energy recovery facility at a site about two miles east of the town of Tampa on the county's Faulkenburg Road site. After a thorough review by DER, includ-ing public hearings, the Florida Power Plant Siting Board issued a site certification to the County. At that 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 Hillsborough County energy recovery facility (ERF), which was under construction, did not possess a valid PSD permit. EPA's remedy for this situation was to issue an Order under Section 167 of the Clean Air Act for Hillsborough County to either cease construction or apply for a federal PSD permit under 40 CFR 52.21. EPA plans to issue in the near future a Federal Register notice clarifying its retention of PSD permitting authority as to sources subject to the PPSA. See also 51 Fed. Reg. 58 (Jan. 2, 1986).

On December 13, 1985, Hillsborough 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.) In conducting the PSD review, EPA decided that, due to the unique circumstances of this permit application, the best available control technology (BACT) analysis would be conducted taking into account the factors affecting BACT at the time the County submitted a complete application for a site certification. That date was August 16, 1984.

Hillsborough County did not agree that it lacks a valid PSD permit and sought judical review of the EPA order requiring a federal permit. Hillsborough County submitted to the federal PSD

permitting process under protest. EPA and Hillsborough County entered into a settlement whereby EPA agreed to propose this draft permit and Hillsborough agreed to dismiss its petition for review.

The proposed project will be an energy recovery facility boiler which could use up to 1200 tons per day (TPD) of refuse as fuel. A proposed boiler expansion could increase the total solid waste processing capacity of the plant to 1600 TPD. The steam from the new boiler will be sent to a turbine generator with a capacity of 29 megawatts (MW) (gross). Hillsborough County has contracted with a full service vendor to design, construct, and operate the plant for 20 years. Generated electricity will be transmitted to the Tampa Electric Company (TECO) for distribution over the TECO transmission system. The generating capacity of the expanded plant should be approximately 39 MW. The primary purpose of the facility is to dispose of solid waste. In addition to electricity, steam, ferrous metals, and aluminum could be recovered resources. Non-processible waste (including non-combustibles and demolition debris) and unusable residue will be buried at a licensed, off-site sanitary landfill. The sale of electricity, and eventually other processed and recovered resources, will help offset the overall cost of owning and operating the facility.

The Energy Recovery Facility (ERF) will be located on approximately 50.4 acres within the County's existing Faulkenburg Road tract. The site is located approximately 0.6 miles north of State Road 60. It is bordered by Faulkenburg Road on the east and a TECO 230 KV transmission line corridor on the west, and the Seaboard System Railroad on the south. The plant site is mostly level grassy land with scattered trees in the northwest portion. The site has been recently used as improved pasture for cattle grazing. The topography is fairly level, with elevation ranging from 27 to 45 feet above sea level across the tract. Geology of the site shows an overburden of sand and clay lying over limestone and dolomite which forms the Floridan aquifer. The overburden forms a subsurface reservoir called the shallow aquifer. The proposed facilities will consist of a 29 MW steam electric generating turbine; three 400 tons per day mass-burn solid waste fired boilers; a mechanical draft cooling tower utilizing treated sewage effluent; a 220 foot flue gas stack and electrostatic precipitators. Provisions are made to allow the addition of another 400 tons per day boiler.

Tampa Electric Company's existing 230 KV transmission line corridor will be used to transmit the electricity from the Energy Recovery Facility (ERF).

II. Rule Applicability

The proposed site of the Hillsborough County ERF is in an area designated as nonattainment for ozone and particulate matter 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 Hillsborough 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 greater than 50 TPD are also subject to Florida Rule 17-2.600(1)(c).

The applicant is proposing the construction of three 400 TPD mass burn technology incinerators for the processing of up to 1200 TPD of municipal solid waste. A fourth unit of similar size may be constructed in the future but will not be addressed in this review.

The maximum annual emissions from all three units for all regulated pollutants have been estimated by the applicant. These emission rates, and the PSD significant emission rates, are listed in Table II.1.

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 as listed in Table II-1. For the proposed source, the applicant has addressed PSD review for the eight pollutants which will be emitted in significant amounts: SO_2, CO, NO_x, Pb, Be, Hg, fluorides, and sulfuric acid mist.

The proposed source will emit less than 100 TPY of both particulate matter and VOC (precursor of ozone), and is thus not subject to the construction ban of 40 CFR 52.24. The proposed incinerators will each have a charging rate of 400 tons per day,

and thus are 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

As noted in Section I, Table II-1, the proposed source will result in significant emissions of the criteria pollutants SO_2, CO, NO_x, and lead, and of the non-criteria pollutants mercury, beryllium, 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 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 Hillsborough County ERF, 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.

Table II-1

Hillsborough County Resource Project
Proposed Annual Emmision Rates

Pollutant	Proposed Maximum Emission Rate (Ton/Yr)(1)	Significant Emission Rate for PSD Applicability
Particulate Matter (PM) (2)	90	N/A
Volatile Organic Compounds (2)	44	N/A
Sulfur Dioxide (SO2)	701	40
Carbon Monoxide (CO)	395	100
Nitrogen Oxides (NOx)	657	40
Lead (Pb)	4.4	0.6
Mercury (Hs)	1.1	0.1
Beryllium (Be)	0.003	0.0004
Fluorides	13	3
Sulfuric Acid Mist	17	7
		-

(1) Based on processing 1200 tons per day MSW for 365 days per year

(2) Nonattainment Pollutant

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. For the proposed three unit plant, eight pollutants are subject to BACT. The BACT emission limits proposed by the Department are summarized as follows:

Pollutant	BACT
Sulfur Dioxide	3.20 lb/ton
Nitrogen Oxides	3.0 lb/ton
Carbon Monoxide	1.80 lb/ton
Lead	.020 lb/ton
Mercury	2200 grams/day
Beryllium	1.3×10^{-5} lb/ton
Sulfuric acid mist	.077 lb/ton
Fluorides	.060 lb/ton

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

The applicant ultimately plans to construct a 1600 ton per day municipal solid waste (MSW) incinerator facility to be located on Faulkenburg Road in Tampa, Florida. The heat energy from combustion of the MSW will be used to produce steam to operate a 39 megawatt output turbine generator. Some of the electric energy produced will be used at the facility with the surplus power to be sold to the Tampa Electric Company.

The present plans are to install three 400 tons per day (TPD) incinerator-boiler units to process a total of 1200 TPD of MSW and generate 29 megawatts of electrical power. The fourth unit will be added at some future time. This BACT determination is for the three units only. Before the fourth unit is installed, the applicant must apply for a new permit for that unit.

Each incinerator will have an approximate heat input of 150 million Btu per hour, or 49 megawatts, based upon a MSW calorific content of 4500 Btu per pound. Each incinerator will be scheduled to operate 8760 hours per year and on this basis the tons per year of the various air pollutants emitted was calculated.

Based upon air pollutant emission factors provided by the applicant, the calculated total annual tonnage of regulated air pollutants emitted from the three units to the atmosphere is listed in Table II-1.

The applicant has proposed the following air pollutant emission limits, on a pound per ton basis: Particulate-0.41, CO-1.8, SO_2-3.2, NO_x-3.0, Pb-0.048, Hg-0.0052, Be-13.1 $x10^{-6}$, sulfuric acid mist-0.077, fluorides-0.06, and VOC-0.2 lb/ton. 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 MSW, a low sulfur content fuel, will limit SO_2 and sulfuric acid mist emissions.

The applicant has requested emission limits for SO_2 to be a 24-hour limit of 3.2 pounds per ton of MSW charged into the incinerator and a 3-hour limit of 8.5 pounds per ton of MSW charged into the incinerator. Emission test data from Westchester County, New York and Gallatin, Tennessee solid waste combustion sources indicate a range for SO_2 emissions from 2.6 to 3.5 pounds per ton of feed.

The 3.2 figure is judged to be BACT. The amount of SO_2 emitted would be comparable to the burning of distillate oil having a 0.35 percent 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 is not warranted when burning MSW.

The mercury emission limit determined as BACT is equal to 69% of the National Emission Standard for Hazardous Air Pollutants (NESHAP), 40 CFR 61.50, Subpart E, for municipal waste water sludge incineration plants. The provisions of this subpart, however, do not apply because no grease, scum, grit screenings or sewage sludge will be incinerated in the proposed incinerators. According to the report "Air Pollution Control at Resource Recovery Facilities" issued by the California Air Resources Board, the average mercury emission factor when firing MSW is 4 x 10^{-4} pounds per million Btu. This amounts to 30 grams per hour per unit and is not considered to have a major impact on the environment. The applicant has proposed a mercury emission rate of 0.0052 lb/ton which is 0.0013 lb/ton higher than the referenced factor. The BACT is determined to be 2200 grams/day.

The uncontrolled emission of beryllium, according to the California report, when firing MSW is estimated to be 6.2 x 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 absorption/condensation of beryllium oxides, present in the flue gas stream, onto available fly ash particles subsequently removed by the control device. Assuming 95% efficiency of the 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 13.1 x 10^{-6} lb/ton MSW proposed by the applicant is judged to be BACT. If beryllium containing waste as defined in the National Emission Standards for Hazardous Air Pollutants (NESHAP), Subpart C, Subsection 61.31(g), were charged into the incinerator, emissions of beryllium to the atmosphere could not exceed 10 grams per 24 hours or an ambient concentration of 0.01 ug/m3, 30 day average. Compliance with this beryllium emission limit would be in accordance with NESHAP, Subpart C. However, the applicant has not applied to burn beryllium-containing waste, and the permit prohibits this activity.

The temperature of the incinerator combustion gases at the inlet to the particulate control device is estimated to be 425-475 °F. At these temperatures any lead would be in a nonvaporous state and would be removed by the particulate control device. The lead emission limit will initially be set at 0.020 pounds per ton of MSW charged into the incinerator. If the initial compliance tests show that the lead emissions are greater than or equal to 0.0080 pounds per ton, the lead emission limit of 0.020 pounds per ton will remain in effect. If the initial compliance tests show that the lead emissions are less than 0.0080 pounds per ton, the lead emission limit will be reduced to 0.010 pounds per ton. This level of control is judged to be BACT.

Since there are several secondary lead reclamation plants in the Tampa area, there is an economic incentive to recycle lead containing materials. The majority of lead emissions from an incinerator are expected to originate from solder joints in discarded electronic devices. The amount of lead emitted is not considered to have a significant impact upon the environment.

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 emissions. 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.

The proposed units will use proprietary grate and combustion controls to limit NO_x emissions at 3.0 pounds per ton of MSW 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 department agrees with the applicant that BACT is the grate and combustion control system to insure sufficient mixing of the MSW and air so that the emission of products of incomplete combustion is minimized. The proposed CO emission rate is 1.8 pounds per ton. This level of control is judged to represent BACT.

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.

Particulate matter emissions will be controlled by an electrostatic precipitator (ESP). Each of the three proposed boilers will be equipped with its own ESP which will be efficient to 0.021 grains per dry standard cubic foot corrected to 12% CO_2 at the outlet. At this emission rate, particulate matter emissions for the facility will be approximately 96 tons per year.

VOC emissions, like carbon monoxide emissions, result from incomplete oxidation of carbon compounds. Control of CO and VOC emissions can be mutually supportive events.

The applicant indicates that sulfuric acid mist and fluorides will be emitted by the proposed facility. The applicant estimates that sulfuric acid mist will be emitted at a rate of 0.0768 pounds per ton of fuel combusted. This equates to a rate of 3.8 pounds per hour or 16.8 tons per year. The significant emission rate for sulfuric acid mist is 7.0 tons per year. Emissions of fluoride are estimated at 0.06 pounds per ton of fuel combusted. At this emission rate, fluorides would be emitted at a rate of 3.0 pounds per hour or 13.1 tons per year. The significant emission rate for fluoride is 3.0 tons per year. Control of these acid gas emissions would be obtained by a scrubber. However, at the level of these acid gas emissions, the addition of a scrubber for acid gas control would be uneconomical. No control is judged to represent BACT. In addition, BACT for the control of acid gas emissions is that the initial design of the proposed facility include provisions for

the possible future installation of a wet or dry flue gas scrubber system, if deemed necessary.

b. NSPS and Florida SIP Limit Analysis

These two regulations dictate similar emission limits using slightly different units. The proposed particulate emission limit of 0.021 gr/dscf is far below either of these limits.

V. Air Quality Analyses

The air quality impact of the proposed emissions has been analyzed. Atmospheric dispersion modeling has been completed and used in conjunction with an analysis of existing air quality data to determine maximum ground-level ambient concentrations of the pollutants subject to BACT. Based on these analyses, the department has reasonable assurance that the proposed solid waste recovery facility in Hillsborough 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 particles emitted into the atmosphere by point, area and volume sources. The ISCST model allows for the separation of sources and several other features, such as the inclusion of building wake downwash. This model was used in both screening and refined analyses.

All modeling was completed assuming the operation of four incinerators. Since the current plans are for the construction of only three incinerators, the modeling results represent a slightly conservative estimate of ambient concentrations.

Screening analyses were initially run using 26 prescribed meteorological conditions with the stack and emission data of the proposed ERF. These runs determined the worst-case boiler operating condition, identified those pollutants emitted from the ERF with a potential for significant impact, and established receptor locations for the more refined modeling. The results of these analyses indicated that a 110 percent boiler load condition (440 tons per day throughput) yielded the greatest air quality impact with the maximum ground-level concentrations occurring approximately 400 meters from the stack.

The refined modeling analysis consisted of running ISCST using five years of sequential hourly meteorological data. The surface and upper air meteorological data used were National Weather Service data collected at Tampa, 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.

An initial set of refined runs was made with emissions only from the proposed ERF. The significant impact area for SO_2 was then determined. This area is defined as the area enclosed by a circle whose radius is equal to the farthest distance from the facility in which a significant impact occurs. A significant impact is defined as 25 ug/m^3 for a 3-hour average, 5 ug/m^3 for a 24-hour average, and 1 ug/m^3 for an annual average. For this project the significant impact area extends to a distance of approximately one kilometer. Beyond this distance the ERF is assumed to have an insignificant SO_2 impact.

Modelled emission rates for some pollutants were higher than the BACT limits, which produced conservative estimates of ambient impacts. For a comparison of these rates, Table V-2 should be compared to the BACT emission rates in Section IV.a.

Other major SO_2 sources within about 30 kilometers of the proposed facility were modeled for impact within the significant impact area. The impacts of the other emitted pollutants were evaluated using emissions from the ERF only. 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 contained in Table V-1 and Table V-2, respectively. Copies of some of the critical model outputs and a description of the refined modeling analysis are attached to this determination in Appendix 1. Complete modeling printouts are available at the DER offices in Tallahassee, Florida.

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 no less than four months, may be accepted when department approval is given.

Table V-1
Hillsborough County Resource Recovery Project
Source Parameters

Source	UTM-E (km)	UTM-N (km)	SO_2 (g/s)	Stack Height (m)	Temp. (K)	Exit Vel. (m/s)	Stack Dia. (m)
PSD Sources							
Hillsborough Co. RRF	368.2	3092.7	29.6	67.0	494	16.9	3.50
Pinellas RRF 1-3	335.2	3084.1	31.5	49.1	505	26.8	2.37
McKay Bay RRF	360.0	3091.9	21.4	45.7	500	21.3	1.91
TECO Big Bend	361.9	3075.0	8598	149.4	426	15.6	7.00
NAAQS Sources							
FPC Bartow	342.4	3082.7	722.2	91.4	408	44.0	3.35
FPC Higgins	336.5	3098.5	286.7	53.0	422	10.4	3.81
FPC Anclote #1	324.9	3119.0	1631.9	152.1	416	50.0	3.66
FPC Anclote #2	324.9	3119.0	816.0	152.1	416	28.3	3.66
TECO Hooker Pt. #1)	358.0	3091.0	41.30	85.4	402	18.2	3.40
TECO Hooker Pt. #2)	358.0	3091.0	41.30	85.4	402	18.2	3.40
TECO Hooker Pt. #3)	358.0	3091.0	37.00	85.4	397	11.5	3.70
TECO Hooker Pt. #4)	358.0	3091.0	57.00	85.4	397	11.5	3.70
TECO Hooker Pt. #5)	358.0	3091.0	84.00	85.4	402	18.2	3.40
TECO Hooker Pt. #6)	358.0	3091.0	107.00	85.4	436	17.9	2.90
TECO Gannon #1	360.0	3087.5	282.5	93.3	438	22.5	3.70
TECO Gannon #2	360.0	3087.5	282.5	93.3	438	32.4	3.10
TECO Gannon #3	360.0	3087.5	321.4	93.3	427	35.4	3.20
TECO Gannon #4	360.0	3087.5	421.6	93.3	443	24.6	2.90
TECO Gannon #5	360.0	3087.5	513.4	93.3	415	20.6	4.50
TECO Gannon #6			853.6	93.3	415	23.7	5.40
General Portland	358.0	3090.6	349	44.3	473	6.6	4.72
Gardinier	363.4	3082.4	473.3	29.4	333	9.1	2.10
Gardinier	363.4	3082.4	-210.26	36.5	344	11.8	2.00

Table V-1 (cont.)

Source	UTM-E (km)	UTM-E (km)	SO_2 (g/s)	Stack Height (m)	Temp. (K)	Exit Vel. (m/s)	Stack Dia. (m)
AMAX (Pt. No.)	393.8	3096.3					
			12.0	30.5	335.1	12.0	1.37
01			3.3	24.4	315.8	8.9	1.67
02			17.6	46.3	308.6	11.0	1.76
03			29.0	45.7	315.6	15.9	1.76
05			2.8	6.1	550.2	15.3	0.40
19			1.4	3.4	605.2	20.2	0.37
20			27.1	46.3	298.0	13.1	1.76
26 - 28			2.1	10.6	605.2	15.3	0.36
29							
CF Industries (Pt. No.)	380.0	3115.7					
01			6.1	7.5	560.0	19.7	1.07
10			6.2	28.7	316.3	7.2	3.05
11			9.2	54.9	321.9	12.6	2.79
12			13.7	54.9	315.2	9.8	2.79
13			13.7	54.9	324.7	10.5	2.79
Chloride Metals (Pt. No.)	361.8	3008.3					
01			10.1	32.2	346.7	27.8	0.58
04			10.1	29.9	363.0	14.4	0.61
Columbia Paving	366.7	3077.8	3.7	12.2	339.7	22.3	1.37

Table V-1 (cont.)

Source	UTM-E (km)	UTM-E (km)	SO_2 (g/s)	Stack Height (m)	Temp. (K)	Exit Vel. (m/s)	Stack Dia. (m)
Columbus Company	361.9	3077.8	4.8	12.6	449.7	20.0	1.24
Couch Construction	364.3	3098.1	3.3	10.4	390.8	17.2	1.41
Delta Asphalt	372.1	3105.4	4.8	8.4	381.3	20.6	1.17
Gulf Coast Lead co.	363.9	3093.8	47.2	29.6	347.4	24.9	0.62
IMC Port Sutton	360.1	3087.5	41.5	19.8	338.6	10.5	2.41
Thatcher Glass (Pt. No.)	361.2	3103.3	2.6	41.1	694.1	9.4	1.52
Furnace No. 1			2.6	41.1	656.9	11.4	1.52
Furnace No. 2							
Nitram	363.2	3089.0	3.1	27.4	505.2	10.8	1.37
National Gypsum (Pt. No.)	347.3	3082.7					
Dryer No. 1/Zone 1			0.66	12.5	388.6	8.5	1.07
Zone 2			0.66	12.5	424.7	9.1	0.91
Zone 3			0.66	12.5	330.2	9.1	0.91
Dryer No. 2/Zones 1&2			1.0	10.1	421.9	20.7	0.76
Zone 3			0.5	10.1	408.0	10.4	0.76
Zone 4			0.5	11.3	394.1	25.9	0.91

Table V-2
Hillsborough County Resource Recovery Project
Maximum Hourly Emission Rates Used
in Modeling

Pollutant	Emission Rates (1) lb/ton	g/s
Particulate Matter	0.38	3.5
Sulfur Dioxide	3.2 (2)	29.6
Carbon Monoxide	1.8	16.6
Nitrogen Oxides	3.0	27.7
Lead	0.02	0.185
Hydrocarbons (non-methane)	0.2	1.85
Mercury	0.0052	0.048
Beryllium	0.0000131	0.000121
Fluorides	0.06	0.554
Sulfur Acid Mist	0.0768	0.710
Hydrogen Chloride	4.0	37.9

(1) Based on a throughput of 110 percent of design capacity and the operation of four incinerators

(2) 3.2 lb/ton was used for 24-hour and annual average modeling and 8.5 lb/ton was used for 3-hour average modeling

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. Such representative data must meet criteria for location, quality, and currentness outlined in EPA publication 450/4-80-012, Ambient Monitoring Guidelines for Prevention of Significant Deterioration.

The predicted maximum air quality impacts of the proposed ERF for the eight pollutants subject to PSD review are given in Table V-3 along with the monitoring deminimus levels. From this table it is seen that SO_2, lead, and fluorides have maximum predicted air impacts greater than the deminimus levels and are thus subject to preconstruction monitoring requirements. Sufficient data in the area, however, exists for SO_2 and lead. The department did not require additional monitoring for these pollutants, since the existing data comply with the requirements of EPA 450/4-80-012. Although fluorides are subject to the monitoring requirements, no EPA-approved method currently exists to measure the ambient concentration of this pollutant. Also, requirement for monitoring of noncriteria pollutants is at the discretion of the Department.

Table V-4 shows the monitored ambient air quality levels for the most recent year (1983) for all the criteria pollutants, including the required data for SO_2 and lead. These data were collected from existing monitors in Hillsborough County.

c. PSD Increment Analysis

1. Class II Area

The proposed Hillsborough County ERF is to be located in an area designated as a Class II attainment area for the pollutant SO_2. Because the proposed facility is to be located in an area designated as nonattainment for PM, a PSD increment analysis is required for SO_2 only.

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 emission increases from sources constructed or modified after December 1977 will consume PSD increment.

Table V-3
Maximum Air Quality Impacts Of The ERF
For Comparison To The De Minimus Ambient Levels

Pollutant	Maximum Modeled Concentration (1)(ug/m^3)	De Minimus Ambient Impact Level (ug/m^3)
SO_2 (24-hour)	21.6	13
CO (8-hour)	16.3	575
NO_2 (Annual)	1.0	14
Lead (24-hour)	0.14	0.1
Mercury (24-hour)	0.035	0.25
Beryllium (24-hour)	0.000088	0.00050
Fluorides (24-hour)	0.405	0.25
Sulfuric Acid Mist	0.52	-
PM (2)	2.6	10

(1) Highest second-high concentration assuming four incinerators

(2) PM included for informational purposes.

Table V-4

Hillsborough County 1983 Monitoring Data in the Vicinity of the Proposed Resource Recovery Facility

Pollutant	Site	Location with Respect to the Proposed Facility Direction	Distance (km)	Averaging Time	Concentration Category	Concentration (ug/m^3)
SO_2	4360-052	278°	9.9	3-hour	Second-high	493
				24-hour	Second-high	86
				Annual	Highest	16
NO_2	4360-052	278°	9.9	Annual	Highest	35
CO	4360-052	278°	9.9	1-hour	Second-high	12,600
				8-hour	Second-high	5,700
Lead	1800-082	285°	3.3	Calendar quarter	Highest	0.8
PM(1)	1800-082	285°	3.3	24-hour	Second-high	115
				Annual	Highest	54
O3(1)	4360-035	259°	11.5	1-hour	Second Daily High	281

(1) Nonattainment Pollutants

In addition, all SO_2 emission increases associated with the construction or modification of major sources which occurred after January 6, 1975, will consume increment. For the proposed project all emissions from the ERF consume increment. Several other sources in the area have been identified by the applicant as also consuming PSD increment and have been included in the analysis.

The Department has identified four other sources as having the potential to consume additional PSD increment for SO_2. These sources are the Columbus Company, Couch Construction Company, Weyerhaeuser Company, and Scrapall Company. The first two were included in the modeling for determination of total impact but not for the determination of increment consumption. The latter two were not included in any modeling. A review of these sources indicated that only Columbus Company and Couch Company could potentially have a significant impact on increment consumption in the area of the proposed project. These sources will not interact with the increment consuming sources already modeled by the consultant.

It should be noted that the major increment consuming source identified by the applicant is the TECO Big Bend power plant. All units at this plant were modeled as increment consuming. In actuality only Unit 4 consumes increment and these emissions are largely offset by emission decreases (increment expansion) from Units 1, 2 and 3. As such, increment consumption is greatly overestimated.

Atmospheric dispersion modeling was performed taking into account only those new sources which consume PSD increment. The results of this modeling are summarized in Table V-5.

2. Class I Areas

A Class I area increment analysis is required for the Chassahowitzka National Wilderness Area located 79.6 kilometers to the north-northwest. The impact of the proposed ERF on this Class I area was determined. Although the distance to the Class I areas is greater than 50 kilometers (the distance to which the models are generally considered valid) the results indicate an extremely small (insignificant) impact on this area.

Table V-5

Comparison of New Source Impacts
with PSD Increments

Pollutant and Averaging Time	PSD Class II Increment (ug/m^3)	Predicted Increased Concentration (ug/m^3)	Increment Consumed (%)	PSD Class I Increment (ug/m^3)	Predicted Increased Concentration (ug/m^3)
SO_2					
3-hour	512	465	91	25	<1
24-hour	91	87	96	5	<1
Annual	20	5	25	2	<<1

d. AAQS Analysis

Given existing air quality in the area of the proposed Hillsborough County ERF, emissions from the new source are not expected to cause or contribute to a violation of an AAQS. The results of the AAQS analysis are contained in Table V-6.

Of the pollutants subject to PSD review only the criteria pollutants SO_2, CO, NO_2, and lead have an AAQS to compare with. All sources listed in Table V-1 were modeled to determine the maximum ground-level impacts for SO_2 within the area of significant impact. For CO, NO_x, and lead only the proposed ERF was modeled to determine the maximum ground- level concentrations.

The total impact on ambient air is obtained by adding a "background" concentration to the maximum modeled concentration. This "background" concentration takes into 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 listed in Table V-4. This is a conservative estimate because sources used in the modeling may have contributed to the monitored value and hence contribute doubly to the total impact.

VI. Additional Impacts Analysis

a. Impacts on Soils and Vegetation

The maximum ground-level concentrations predicted to occur for the criteria pollutants as a result of the proposed project in conjunction with all other sources, including a background concentration, will be 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.

The applicant has additionally addressed the impacts of the noncriteria pollutants. No soils or species of vegetation near the proposed project are known to be sensitive to these pollutants at the concentrations predicted to occur. These pollutants include sulfuric acid mist, fluorides, mercury, beryllium, and hydrochloric acid. Hydrochloric acid (HCL) is not one of the PSD review pollutants but was included at the Department's request because of its large emissions.

Table V-6

Comparison of Total Impacts with
Ambient Air Quality Standards

Pollutant and Averaging Time	Maximum Impact Project	Maximum Impacts All Sources (ug/m^3)	Existing Background (ug/m^3)	Maximum Total Impact (ug/m^3)	National AAQS (ug/m^3)
SO_2					
3-hour	106	519	493	1012	1300
24-hour	22	163	86	249	365
Annual	1	9	16	25	80
CO					
1-hour	32	-	12600	12632	40,000
8-hour	16	-	5700	5716	10,000
NO_2					
Annual	1	-	35	36	100
Lead					
Quarterly	0.14 [1]	-	0.8	0.9	1.5

[1] The maximum quarterly average was conservatively estimated by using the maximum 24 hour average

b. Impact on Visibility

A level-1 visibility screening analysis was performed to determine any impact on the Chassahowitzka National Wilderness Class I area. The analysis showed that there was no potential for an adverse impact on visibility in this area due to emission from the proposed project.

c. Acid Rain Impact

The increased emissions of SO_2 and NO_x, precursors to possible acid formation and subsequent acidic rain, from the proposed project are extremely small in comparison with the emissions of these pollutants from nearby power plants. Thus, no significant adverse impact on the acidity of rainfall is expected as a result of this project.

d. Growth-Related Air Quality Impacts

The construction and operation of the proposed source will have a minor positive net effect on industrial and commercial development. The source will promote development by providing for solid waste disposal, and thereby be an integral part of the plans for development within Hillsborough County. On a regional basis this effect is not expected to be significant. The project is not expected to significantly change employment, population, housing, or commercial/industrial development in the area to the extent that an air quality impact will result.

e. GEP Stack Height Determination

Good engineering practice (GEP) stack height means the greater of: (1) 65 meters; or (2) the maximum nearby building height plus 1.5 times the building height or width, whichever is less. For the proposed project the building height is 42.7 meters above ground level and the projected width is 56.4 meters. Thus definition (2) above leads to a GEP stack height of 106.8 meters.

The proposed stack height is 67 meters. This is less than the GEP height. The applicant has addressed the possible increased ground-level concentrations (as a result of aerodynamic effects of the nearby building) by including a downwash mechanism in the modeling.

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 particulate matter and ozone, but is not a major source for either pollutant, and thus will not subject to the construction ban. The source will be located 43.5 kilometers from an SO_2 nonattainment area and is a major source for SO_2. Under the Interpretative Ruling, the proposed source would be subject to certain more stringent requirements if the impact of its SO_2 emissions on the nearby nonattainment area exceeded 1 ug/m^3 annual average, 5 ug/m^3 24-hour average, or 25 ug/m^3 3-hour average. The modeling analysis shows the impact of the proposed source to be less than each of those levels, so the Interpretative Ruling will not apply.

PART I

Specific Conditions

1. Emission Limitations

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

(1) Particulate matter: 0.021 grains per dry standard cubic foot corrected to 12% CO_2 (gr/dscf-12%) or 7.0 pounds per hour per unit, whichever is more restrictive.

(2) Visible Emissions: Opacity of stack emissions shall not be greater than 15% opacity except that 20% opacity may be allowed for one six-minute period (average of 24 consecutive observations recorded at 15-second intervals) in any one hour. 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. Opacity of other emission points at the plant shall not exceed 5%.

(3) VOC: 0.01 gr/dscf-12%, or 0.2 lb/ton, whichever is more restrictive

(4) SO_2: 0.17 gr/dscf-12% or 3.2 lb/ton, whichever is more restrictive, 24-hour average, 0.45 gr/dscf-12% or 8.5 lb/ton, whichever is more restrictive, 3-hour average

(5) Nitrogen Oxides: 0.16 gr/dscf-12%, or 3.0 lb/ton, whichever is more restrictive

(6) Carbon Monoxide: 0.093 gr/dscf-12%, or 1.8 lb/ton, whichever is more restrictive.

(7) Lead: 0.00104 gr/dscf-12%, or 0.020 lb/ton, whichever is more restrictive.

(8) Fluorides: 0.0031 gr/dscf-12%, or 0.060 lb/ton, whichever is more restrictive.

(9) Sulfuric Acid Mist: 0.0040 gr/dscf-12%, or 0.077 lb/ton, whichever is more restrictive.

(10) Beryllium: 6.8 x 10-7 gr/dscf-12%, or 1.3 x 10-5 lb/ton, whichever is more restrictive.

(11) Each of the emission limits in conditions (1) and (3) through (10) is to be expressed as a 3-hour average. This averaging time, which is applicable to the emission limits for all pollutants, is based on the expected length of time for a particulate compliance test. The concentration standards in conditions (3) through (10) are included as the primary compliance limit to facilitate simpler compliance testing, since the process weight, in tons per hour, is not easily measured. The concentration limit is intended to be equivalent to the lb/ton limit. The concentration limits were derived by dividing the lb/ton limits by the calculated volume of flue gas produced when one ton of refuse is combusted. If actual process conditions, i.e., dscf per ton of refuse fired, are different than projected by the applicant, EPA may, at its discretion, determine compliance based upon the lb/ton limits.

(12) Mercury: 2200 grams/day

(13) 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.

(14) Each of the three units is subject to 40 CFR Part 60, Subpart E, New Source Performance Standards

(NSPS), except that where requirements in this permit are more restrictive, the requirements in this permit shall apply.

(15) Only natural gas will be used as an auxillary fuel.

b. Compliance Tests

(1) Compliance tests for particulate matter, SO_2, nitrogen oxides, CO, VOC, sulfuric acid mist, 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 for such time and under such conditions as specified by EPA prior to the compliance test. These conditions will be specified by EPA upon notification of performance tests as required by General Condition 1. The permittee shall make available to EPA such records as may be necessary to determine the conditions of the performance tests.

(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. One 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 25 for determination of volatile organic compounds (VOC) concentration. One sample shall constitute one test run.

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

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.

(3) The stack tests shall be performed at $\pm$10% of the heat input rate of 150 million Btu per hour per boiler; however, compliance with the particulate matter emission limit shall be at design capacity.

2. The height of the boiler exhaust stack shall be 220 feet above ground level at the base of the stack.

3. The incinerator boilers shall not be loaded in excess of their rated capacity of 36,666 pounds 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, to the electrostatic precipitator design, and to 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. Electrostatic Precipitator

   The electrostatic precipitator shall be designed and constructed to limit particulate emissions to no more than 0.021 grains per dscf corrected to 12% CO_2.

8. Stack Monitoring Program

   The permittee shall install and operate continuous monitoring devices for stack oxygen and opacity. The monitoring devices shall meet the applicable requirements of Rule 17-2.710, FAC, 40 CFR Part 60, Subparts A and D, Sections 60.13 and 60.45 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 Southwest Florida District Office, the Hillsborough County Environmental Protection Commission (HCEPC) and EPA Region IV.

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

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. Southwest District Office of DER

District Manager
Department of Environmental Regulation
7601 Highway 301 N.
Tampa, FL 33610

d. HCEPC

Chief, Air Group
Hillsborough County Environmental Protection Commission
1900 9th Ave.
Tampa, FL 33605

12. The facility shall provide space for the future installation, if necessary, of a wet or dry flue gas scrubber.

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.

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),

Hillsborough County, Florida

is, as of the effective date of this permit (PSD-FL-104) authorized to construct a stationary source at the following location:

Two miles east of Tampa on a site owned by the County on Faulkenburg Road, 0.6 miles north of State Road 60.

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

_____ Date Signed

_____ Regional Administrator

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.

p.2-51 Solid Waste Disposal. Figure 2.14 shows the location of existing and proposed solid waste management facilities within the County. Currently, all of the solid waste generated in Hillsborough County, including that generated by the three cities, is disposed of at the County's Hillsborough Heights landfill. The monthly solid waste quantities received at the Hillsborough Heights Sanitary Landfill from May 1981 to April 1983 are shown in Table 2.21. Approximately 2,000 tons per day (six days per week) of solid waste are disposed of at this site, of which about 750 tons per day (six days per week) is delivered by the City of Tampa.

p.3-5 The Board of County Commissioners has officially stated that the County will own the project. The contractor will provide a full-service arrangement, including design, construction, acceptance testing, and 20 years of continuous operation, for a "mass-burn" type resource recovery facility with a continuous design rated capacity of 1,200 tons per day using three combustion/steam generation units each with a continuous design rated capacity of 400 tons per day. Additionally, the layout of the project will allow the addition of a fourth combustion/steam generation unit. Initial project construction will include a tipping area and refuse storage pit sized to handle 1,600 tons per day (continuous design rated capacity) and the stack shall have four (4) flues.

p.3-6 Since the proposed facility will utilize mass-burn technology, there will be no preprocessing of wastes at the facility prior to combustion (except for some limited size reduction of oversized items.) A schematic diagram of a typical resource recovery facility is presented in Figure 3.1. MSW will be truck-delivered to the facility and ash residue removed by the same mode of transport. Under a 1600 tpd configuration, four 400 tpd units would be used in the facility.

p.3-7 As noted above, while the proposed facility will have a maximum design rated capacity of 1600 tpd, its initial design rated capacity will be about 1200 tpd (comprised of three 400 tpd units). Each boiler unit operates independently from the others. It will, therefore, be possible to routinely shut down one unit for periods of maintenance and inspection.

p.3-14 The pit shall be sized for minimum storage capacity of three days of solid waste; i.e. 4,800 tons of solid at a density of 450 pounds per cubic yard.

As noted previously, the proposed energy recovery facility is a new facility to be located in Hillsborough County. At ultimate size, the facility is planned would contain four boilers each with a rated capacity of 400 tpd of MSW for a total of 1600 tod.

p.13 The contractor will provide a full-service arrangement, including design, construction, acceptance testing, and 20 years of continuous operation, for a "mass-burn" type resource recovery facility with a continuous design rated capacity of 1,200 tons per day using three combustion/steam generation units each with a continuous design rated capacity of 400 tons per day. Additionally, the layout of the project will unit. Initial projection construction shall include a tipping area and refuse storage pit sized to handle 1,600 tons per day (continuous design rated capacity) and the stack shall have four (4) flues.

p.14 Once the site is certified by the state, no other state permits will be required for the project. Although the rate continuous design capacity of the project will be 1,200 tons per day (generating about 29 megawatts), site certification is being sought for an ultimate continuous design rated capacity of 1,600 tons per day (generated about 39 megawatts) since it is anticipated that the County may expand the project in the future.

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

Electrostatic Precipitators (4) $4,500.00 total

p.6-12 Total Weight Incinerated (lbs/hr) 133,333. Calculations by GPL 6/13/94 lbs/hr. 400 Tons/day/unit. Stack Diamter: flues, each 5'-9' Diam.

Suppl. Section V: Supplemental Requirements
Total process input rate at design capacity (i.e. name-plate rating) is 1600 TPS, 4 units each at 400 TPD. Residue amount will be 29,000. lb/hr (dry basis) and is derived as follows:

$$\text{Inert Material} = \frac{(133{,}333 \text{ wet lb/feed}}{\text{hr}} \frac{(0.7265 \text{ dry lb})}{\text{wet lb}} \frac{(0.3567 \text{ lb.Carbon}}{\text{dry lb}}$$

$$\frac{28{,}100 \text{ dry lb inert}}{\text{hr}}$$

Emission estimates are contained in the Prevention of Significant Deterioration (PSD) Permit Application

p.3-3 ...using 1,200 tons per day (tpd) of solid waste as fuel. However, certification for an ultimate site capacity of about 39 megawatts, capable

of processing 1,600 tons of solid waste per day, is being sought in anticipation of future solid waste disposal requirements.

Conceptual schematic diagram of the recovery facility is presented in Figure 3-2. Truck transport will be used to deliver MSW to the facility and to remove ash residue from the facility. Under a 1600 tpd configuration, four 400-tpd units would be used in the facility.

p.3-5 Bottom ash from the furnace and flyash from the precipitator will be mixed prior to removal from the facility. Ash will comprise 10 percent of the volume and 25 percent of the weight of the MSW processed by the facility. The ash will be quenched with water to about 30 percent moisture prior to transport to a landfill.

As noted above, while the proposed facility will have a maximum design rated capacity of 1600 tpd, its initial throughput will be about 1200 tpd (comprised of three 400 tpd units). Each boiler unit operates independently from the others. It would, therefore, be possible to routinely shut down one unit for periods of maintenance and inspection

p.3-9 The resource recovery facility will consist of four boilers each capable of firing 400 tpd of reference waste (see Section 3.3 of Volume I) at its maximum continuous rating (MCR). This firing rate will be adjusted as the waste quality changes, i.e. changes in the higher heating value (HHV). This is because one of the objectives of plant operation is to maintain the heat load to the boiler by maintaining the heat release on the grate. When the HHV is low (higher moister and ash fractions, lower combustibles fraction) more waste will be processed, up to 440 tpd per boiler. Likewise, when the HHV is high, less waste will be processed.

The maximum load condition with a heating value of 4,000 Btu/lb resulted in the highest pollutant impacts and therefore this condition is used throughout the modeling assessment (see Section 7.1). This provides for a conservative analysis as the facility is expected to operate, over the long-term, at its maximum continuous rating (MCR) of 400 TPD of reference solid waste subject to an availability of 85 percent.

p.4-2 Emission Factors for Florida Resource Recovery Facilities

Pounds per ton of MSW

	Hillsborough Proposed
Particular matter	0.48
Sulfur dioxide	2.5
Nitrogen oxides	3.0

Carbon monoxide	1.8
Hydrocarbons	1.2
Lead	0.048
Mercury	0.0052
Beryllium	13.1 x 10-6
Fluorides	0.06
Sulfuric acid	7.68 x 10-2
Hydrogen chloride	4.0

p.6-1 Best Available Control Technology/Lowest Achievable Emission Rate Analysis

It is assumed for this analysis that the facility will operate at 100% availability at the maximum firing rate of 110% of the nameplate rating (equal to 1760 TPD)

p.6-2 The stack parameters that were used in the modeling exercise simulated worst-case conditions. That is, recently cleaned boilers operating at maximum load conditions (1760 tpd or 110 percent of the nameplate rating) and firing a waste with a low HHV (4000 BTU/lb).

Although worst-case conditions should be used to calculate maximum short-term pollutant concentrations, annual average conditions would be used to calculate maximum long-term concentrations. However, to minimize the computer time involved with the modeling activities, all impacts, both shore and long-term were predicted based on worst-case stack gas exist conditions. This would therefore over predict the long-term concentrations providing a degree of conservatism. Also, this assumption of worst-case conditions holds true even under conditions of changing waste throughput due to variations in waste quality (i.e. HHV).

Worst-case conditions at maximum load corresponds to firing 1760 tpd solid waste with an HHV of 4,000 BTU/lb and a stack gas exit temperature of 430 deg. F. (ESP Case).

p.7-3 The resource recovery facility will consist of four boilers each capable of firing 400 tons per day (tpd) of reference solid waste. The boilers will typically to be run above 100% of the maximum continuous rate (MCR) but operations at 110% of the MCR caused the greatest air quality impacts and was, therefore, used throughout the air quality analysis (See Section 3.0).

p.7-6 Emission Rates for the Proposed Facility

*Emission rates based on a throughput equal to 110% of design capacity.

Changes in Paragraph 2, page 1 of the permit:

For the modification of a 1,200 ton per day resource recovery facility located at the permitted existing municipal solid waste resource recovery facility in Hillsborough County approximately two times east of Tampa on the county's Faulkenburg Road site.

This permit is issued under the provisions of Chapter 403, and 17-4. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing (s), plans, and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows:

For the modification of a 1,200 ton per day resource recovery facility located at the permitted existing municipal solid waste resource recovery facility in Hillsborough County approximately two miles east of Tampa on the County's Faulkenburg Road site. The UTM coordinates of the plant are 368.2 km E and 3092.7 km N.

1-10

p.2-10 This permit is valid only for the specific processes and operations applied for an indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

p.6-10 Nitrogen Oxides: 9.34 gr/dscf-12%, or 6.4 lb/ton, whichever is more restrictive.
The concentration limit is intended to be equivalent to the lb/ton limit. The concentration limits were derived by dividing the lb/ton limits by the calculated volume of flue gas limits by the calculated volume of flue gas produced when one ton of refuse is combusted. If actual process conditions , i.e. dscf per ton of refuse fired, are different than projected by the applicant, DER may, at its discretion, determine compliance based upon the lb/ton limits.

p.8-10 The boilers shall not be loaded in excess of their rated capacity of 36,666 pounds per hour each.

p.3 Page 8, paragraph 3, Modeling Methodology. It should be noted that the prior modeling for the facility utilized a conservative approach. The stack parameters and emission rates were based on a maximum facility

capacity of 1,760 tons per day and 100% facility availability. As currently constructed, however, the plant will normally handle approximately 1200 tons per day. In addition, it is generally assumed that resource recovery facilities will only be available approximately 85% of the time.

p.2 Under Section IV, captioned 'BACT Determination," OMSH would propose changing the second sentence of the first paragraph to read as follows:

> The ERF is designed to burn up to 1200 tons per day (TPD) of refuse at a heating value of 4500 BTU's per pound, which amount will increase or decrease, respectively, based upon lower or higher heating values, in each case, resulting in an electrical generating capacity of 29 megawatts.

p.2 The proposed project will be an energy recovery facility boiler which could be used up to 1200 tons per day (TPD) of refuse as fuel.

p.3 The applicant is proposing the construction of three 400 TPD mass burn technology incinerators for the processing of up to 1200 TPD of municipal solid waste.

The maximum annual emissions from all three units for all regulated pollutants have been estimated by the applicant. These emission rates, and the PSD significant emission rates, are listed in Table II.1.

The proposed incinerators will each have a charging rate of 400 tons per day.

Table II-1

	Proposed Maximum Emission Rate (Ton/Yr) (1)
Particulate Matter	90
Volatile Organic Compounds	44
Sulfur Dioxide	701
Carbon Monoxide	395
Nitrogrn Oxides	657
Lead	4.4
Mercury	1.1
Beryllium	0.003
Fluorides	13
Sulfuric Acid Mist	17

(1) Based on processing 1200 tons per day. MSW for 365 days per year

p.6 The applicant ultimately plans to construct a 1600 ton per day municipal solid waste (MSW) incinerator facility to be located on Faulkenburg Road in Tampa, Florida.

The present plans are to install the 400 tons per day (TPD) incinerator-boiler units to process a total of 1200 TPD of MSW and generate 29 megawatts of electrical power.

Each incinerator will have an approximate heat input of 150 million Btu per hour, or 49 megawatts, based upon a MSW calorific content of 4500 Btu per pound. Each incinerator will be scheduled to operate 8760 hours per year and on this basis the tons per year of the various air pollutants emitted as calculated.

Screening analyses were initially run using 26 prescribed meteorological conditions with the stack and emission data of the proposed ERF. These runs determined the worst-case boiler operating condition, identified those pollutants emitted from the ERF with a potential for significant impact, and established receptor locations for the more refined modeling. The results of these analyses indicated that a 110 percent boiler load condition (440 tons per day throughput) yielded the greatest air quality impact with the maximum ground-level concentrations occurring approximately 400 meters from the stack.

Table V-2

Pollutant	
Particulate Matter	0.38
Sulfur Dioxide	3.2.
Carbon Monoxide	1.8
Nitrogen Oxides	3.0
Lead	0.02
Hydrocarbons (non-methane)	0.2
Mercury	0.0052
Beryllium	1.0000131
Fluorides	0.06
Sulfur Acid Mist	0.0768
Hydrogen Chloride	4.0

(1) Based on a throughput of 110 percent of design capacity and the operation of four incinerator

Table V-3

(1) Highest second-high concentration assuming four incinerators

p.4 The incinerator boilers shall not be loaded in excess of their rated capacity of 36,666 pounds per hour each. = 440 TPY

Combustion Fundamentals for Waste Incineration

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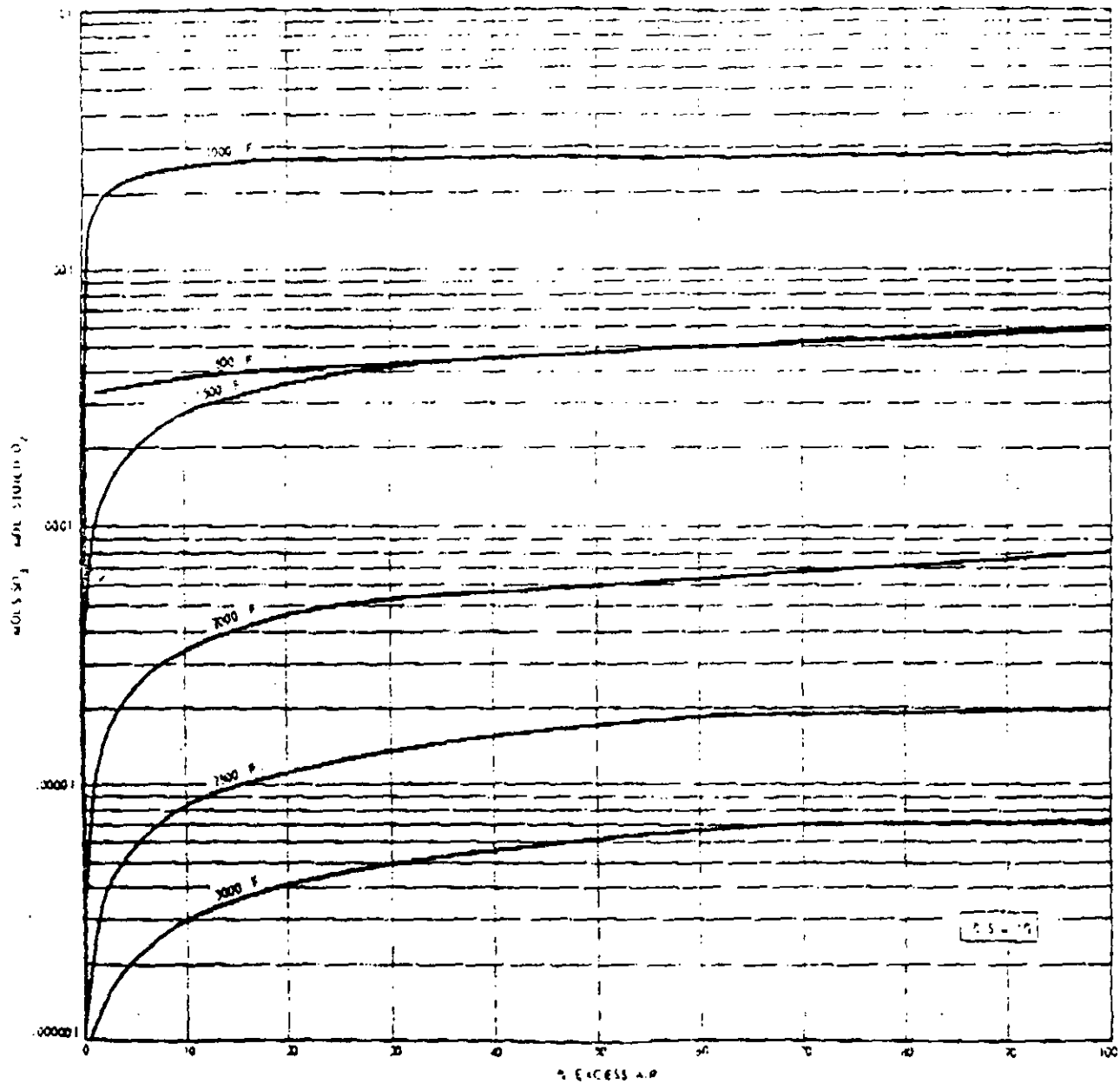

FIG. 8.1

ATTACHMENT "C" P. 4

EDITOR'S NOTE Numbers in parentheses indicate equations. References are noted by numbers in brackets and appear at the end of their respective Chapter or Table. Numbered Source references (also in brackets) for Appendices G and H appear only within the text, since they primarily comprise text material.

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Chapter 8 – Sulfur Oxides

When sulfur is present in a hydrocarbon fuel, it will form oxides under equilibrium combustion conditions. These can be either sulfur dioxide (SO_2) or sulfur trioxide (SO_3). The amount that goes to SO_3 in relation to SO_2 will always be small, but it is often important. The SO_3 form readily combines with water vapor to form a high dew point sulfuric acid that can be both visible and corrosive. Equilibrium calculations for sulfur containing hydrocarbon fuels were made in the following limits.

Sulfur Content: 0.67 to 5.47%
Excess Air: 0 to 100%
Temperature: 500 to 3000°F

The results are plotted on Fig. 8.1. Values of SO_3 expressed as mols per mol of stoichiometric oxygen are plotted vs. excess air in percent with values given along lines of constant temperature. The curve is drawn for 1 percent sulfur fuel content by weight. Values for other percent sulfur contents can be obtained by multiplying the curve by the ratio of the actual sulfur content to one.

Example:

A 2.8 percent sulfur fuel is burned at 2000°F with 25 percent excess air. Determine the ppm of SO_3 and SO_2 if the hydrocarbon part of the fuel is represented by C_4H_6.

From Fig. 8.1, a value of 0.00005 mols SO_3 per stoichiometric mol of O_2 is found at 2000°F and 25 percent excess air. This is for a 1 percent sulfur fuel.

For a 2.8 percent sulfur fuel, the amount of SO_3 produced would be:

$(2.8)(0.00005) = 0.00014$ mols SO_3 per mol stoic. O_2

To convert to ppm:

1 mol C_4H_6 = 53 lbs
1-.028 = 0.972 lbs C_4H_6 per 0.028 lbs S
(0.028/32) = 0.000875 mols S/0.972 lbs C_4H_6
$\left(\frac{0.000875}{0.972}\right)(53)$ = 0.0477 mols S/mol C_4H_6

So

$$C_4H_6 + 0.0477\,S + 1.25(5.25 + 0.0477)O_2 \longrightarrow 4\,CO_2 + 2.5\,H_2O + 0.00014(5.25 + 0.0477)SO_3 + [0.0477 - (0.00014(5.25 + 0.0477))]\,SO_2 + 0.25(5.25 + 0.0477)O_2 + (79/21)1.25(5.25 + 0.0477)N_2$$

(Stoichiometry)

or,

$$C_4H_6 + 0.0477\,S + 6.622\,O_2 \longrightarrow 4\,CO_2 + 2.5\,H_2O + 0.0007417\,SO_3 + 0.04696\,SO_2 + 1.324\,O_2 + 24.912\,N_2$$

On a dry basis, the ppm of SO_3 is:

$$ppm\ SO_3 = \frac{0.0007417}{4 + 0.0007417 + 0.04696 + 1.324 + 24.912} \times 10^6$$

$$= \frac{0.0007417(10^6)}{30.2837} = 24.5$$

$$ppm\ SO_2 = \frac{0.04696(10^6)}{30.2837} = 1550.7$$

$$ppm\ SO_x = 24.5 + 1550.7 = 1575$$

Similar calculations can be made for any fuel whose molecular form or ultimate analysis is known. Note that for this particular case, 1% percent of the sulfur was converted to SO_3.

The relationship of mols to pounds per million Btu can also be calculated or approximated.

Example:

Express the results of the previous example as lbs/10^6 Btu. Since neither a heat of formation nor heating value is available for C_4H_6, assume 1 mol of stoichiometric O_2 is equal to a fuel heating value of 184,000 Btu.

$$\frac{lbs\ SO_x}{10^6\ Btu} = \frac{0.00014\ mols\ SO_3}{mol\ O_2{}^*} \times \frac{mol\ O_2{}^*}{184{,}000\ Btu} \times 10^6 \times \frac{80\ lbs}{mol\ SO_3}$$

$$= 0.06$$

$$\frac{lbs\ SO_2}{10^6\ Btu} = \frac{1550.7\ ppm\ SO_2}{24.5\ ppm\ SO_3} \times \frac{64\ lbs\ SO_2}{80\ lbs\ SO_3} \times 0.06 = 3.014$$