PSD-FL-002
CONTAINER CORP.
FERNANDINA BEACH

PRE-CONSTRUCTION REVIEW AND FINAL DETERMINATION FOR CONTAINER CORPORATION OF AMERICA's FERNANDINA BEACH MILL-NUMBER FIVE RECOVERY BOILER

This review was performed by the
U. S. Environmental Protection Agency
in accordance with the EPA Regulations
for Prevention of Significant Air
Quality Deterioration

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INTRODUCTION AND FINAL DETERMINATION

On December 5, 1974, the Environmental Protection Agency promulgated regulations for Prevention of Significant Air Quality Deterioration (PSD). These regulations were amended on June 12, 1975. Under these regulations, a source that is included in one of 19 source categories must be reviewed with regard to significant deterioration prior to construction. Authority for implementing these regulations in the State of Florida presently rests with the EPA. Therefore, sources wishing to construct in Florida must obtain approval from EPA as well as a permit from the State.

Under the PSD regulations a source must pass two criteria in order to be approved. The first criteria is that Best Available Control Technology (BACT) must be used on all emission points of sulfur oxides and particulate matter within the facility. The second criteria is that increases in ambient concentrations of SO_2 and particulates resulting from emissions from this source must not exceed certain increments. All areas are presently classified as Class II (see attached regulations).

Allowable increments in ambient concentrations are as follows:

Pollutant	ug/m3
Particulate Matter	
Annual Geometric Mean	10
24-Hour Maximum	30
Sulfur Dioxide	
Annual Geometric Mean	15
24-Hour Maximum	100
3-Hour Maximum	700

The increments caused by the source are evaluated using air quality models developed by the EPA.

The Container Corporation of America on March 12, 1976, submitted an application to EPA for approval to construct two emission sources at their paper mill in Fernandina Beach, Florida. This application was supplemented with additional information on March 31, May 27, October 13, November 3, and November 5, 1976. The proposal included a recovery boiler and electrostatic precipitator, and a smelt dissolving tank with a low pressure drop wet scrubber. EPA has determined that a high efficiency electrostatic precipitator for a recovery boiler and the low pressure drop wet scrubber for a smelt dissolving tank represent best available control technology.

On September 10, 1976, the EPA made a preliminary determination that the proposed construction would be consistent with the intent of PSD regulations and therefore could be approved. On September 30, 1976, public notice concerning the preliminary determination was made, including a release in the Jacksonville Journal. A thirty-day comment period was set.

Verbal comments concerning the preliminary determination were received from the Florida Department of Environmental Regulation and the Bio-Environmental Services Division. Container Corporation also submitted additional diffusion modeling results. These comments indicated technical errors in Table I and II in the preliminary determination. As a result, changes have been made to correct these minor technical errors and incorporate the new modeling. These changes in no way affected the approvability of the new source.

Therefore, the construction of this recovery boiler and smelt dissolving tank is approved in accordance with 40 C.F.R. 52.21(d)(2)(ii) with conditions. These conditions are necessary for the following

reasons:

1. An emission limit is required as a condition of approval for each source under 40 C.F.R. 52.21(d)(2)(ii).
2. From the data submitted in the application, EPA is unable to determine whether the specific control devices proposed for application to the sources are best available control technology (BACT). The following general statements can be made concerning BACT for recovery boilers and smelt dissolving tanks as concluded from EPA's investigation of best demonstrated technology in support of the development of New Source Performance Standards for kraft pulp mills:
   a. BACT for particulates is a high efficiency (about 99.5%) electrostatic precipitator (ESP) for the recovery boiler, and for the smelt dissolving tank a low pressure drop wet scrubber.
   b. Smelt dissolving tanks are not significant emitters of SO_2.
   c. BACT for SO_2 from recovery boilers has not been identified by EPA.

Although the application indicates that a 99.7% efficient ESP for the recovery boiler and a wet scrubber for the smelt dissolving will be installed (both are acceptable), EPA must determine, from specific plant and control device design data, whether the specific control devices to be installed will in fact meet the stated efficiencies. Since no design data are available for the control devices, EPA cannot make this decision at the present time. Part of the conditions for approval to construct the plant, therefore, require the applicant to submit certain design and

vendor guarantee information to EPA before purchase of any particulate removal device.

The Following is a Listing of the Conditions of Approval:

1. The applicant must submit to EPA, within five working days after it becomes available, copies of all technical data pertaining to the selected control devices, including formal bid from the vendor, guaranteed efficiency or emission rate, and major design parameters such as plate area (ESP), air flow rates, pressure drop of scrubber, L/G ratio, etc. Although the types of control devices which are described in general in the application have been determined by EPA to be adequate, EPA must review the final selected devices in order to verify the emission limits stated in the application. EPA may, upon review of these data, disapprove the application if EPA determines the selected control device or devices to be inadequate to meet the emission limits specified in the conditioned approval.
2. Additionally, the applicant must comply with the following:
   a. Within 60 days after achieving the maximum production rate at which the facility will be operated, but no later than 180 days after initial startup, the owner or operator shall conduct performance tests and furnish EPA a written report of the results of such performance tests.
   b. Performance tests shall be conducted and data reduced in accordance with methods and procedures specified by EPA. Reference Methods 1 through 5 as published in Appendix A of 40 C.F.R. 60 will be used for particulate tests.

c. Performance tests shall be conducted under such conditions as EPA shall specify based on representative performance of the facility. The owner or operator shall make available to EPA such records as may be necessary to determine the conditions of the performance tests.

d. The owner or operator shall provide EPA 30 days prior notice of the performance test to afford the opportunity to have an observer present.

e. The owner or operator shall provide or cause to be provided, performance testing facilities as follows:

   1. Sampling ports adequate for test methods applicable to the facility.
   2. Safe sampling platform(s).
   3. Safe access to sampling platform(s).
   4. Utilities for sampling and testing equipment.

f. Each performance test shall consist of three separate runs using the applicable test method. Each run shall be conducted for the time and under the conditions specified by EPA. For the purpose of determining compliance with an emission limitation, the arithmetic mean of results of the three runs shall apply. In the event that a sample is accidentally lost or conditions occur in which one of the three runs must be discontinued because of forced shutdown, failure of an irreplaceable portion of the sample train, extreme meteorological conditions, or other circumstances, beyond

the owner or operator's control, compliance may, upon the approval of EPA, be determined using the arithmetic mean of the other two runs.

3. For the recovery boiler the source must meet an emission limit as measured under Part (2) as follows:

   Particulate matter emitted from the recovery boiler shall not exceed 0.1 grams per dry standard cubic meter (0.044 gr/dscf), corrected to 8 volume percent oxygen when the actual oxygen concentration exceeds 8 percent. Also, the stack gases must not at any time exceed 35 percent opacity as measured by EPA Method 9 (in 40 C.F.R. 60). For the smelt dissolving tank, the source must meet an emission limit, as measured under Part (2) as follows:

   Particulate matter emitted from the smelt dissolving tank shall not exceed 0.15 grams per kilogram of unbleached air dried pulp (0.3 lb/ton).

Beginning one month from final condition construction approval from EPA and ending when on-site construction of the source is initiated, the applicant shall submit to EPA each month a letter briefly outlining the status of engineering design and purchase of each source and its related particulate control equipment. This requirement is made in order for EPA to ensure that condition (1) above is properly followed and to quickly identify any omissions in the submittal of information by the applicant.

Air Quality Analysis

The purpose of this section is to present the results of a diffusion analysis, using EPA's air quality models, to predict the maximum concentrations for suspended particulates (TSP) and sulfur dioxide (SO_2) for various averaging periods. Actual modeling analysis was conducted by Container Corporation in accordance with Region IV guidance and was submitted to the Agency. The methodology and results of the analysis are presented in the next section of this report. Based on these results, the following conclusions may be drawn from the installation of the proposed black liquor recovery boiler/smelt tank:

1) The impact of the boiler and smelt tank operations will be in compliance with EPA's regulations for the Prevention of Significant Deterioration promulgated in the Federal Register, December 5, 1974.

2) The ground-level concentrations of TSP and SO_2 due solely to the operations of the proposed units will not contravene any applicable State or Federal ambient air quality standard.

Methodology and Results

The impact of the proposed facility upon local ambient contaminant levels was evaluated by means of mathematical models which simulate the processes of transport and diffusion of stack effluents in the atmosphere. The models employed for this purpose are Gaussion plume models developed by the Meteorological Laboratory of the Environmental Protection Agency.

Inputs include physical dimensions and emission characteristics of the source, as well as hourly values of those meteorological parameters affecting plume behavior. Ground level concentrations of TSP and SO_2 attributable to facility emissions were computed for three and twenty-four hour averaging periods. The output obtained from application of the models consists of hourly and daily average concentrations at each designated "receptor" locations.

Table I presents the input parameters to the models for each of the two major point sources at the proposed facility; (1) the recovery boiler, (2) smelt tank. The diffusion study using the EPA's CRS-1 model indicated that the maximum 24-hour concentration occurred approximately 1.0 kilometers from the facility.

The models utilized in this study are the PTMAX, PTMTP-W, CRS-1, and AQDM. Container Corporation ran the PTMAX, PTMTP-W and AQDM as part of an air quality impact analysis for the proposed unit. The CRS-1 runs for both SO_2 and particulates prepared by EPA IV provided meteorological data for use in the short-term modeling submitted in this application and annual PSD incremental concentrations resulting from the normal operation of the proposed facility. Annual baseline concentrations for SO_2 and particulates in the Fernandina Beach area were based on ambient air quality data obtained from SO_2 and particulate monitors in Fernandina Beach, as well as additional modeling submitted by Container Corporation during the comment period using the AQDM model. The CRS-1 was utilized to predict annual incremental usage by the normal operation of the proposed units.

TABLE I

OPERATING AND EMISSION PARAMETERS DURING NORMAL OPERATION

	#5 Recovery Boiler	#5 Smelt Tank
Design Process Weight (tons/hour)	42.0	.20
Sulfur (%)	6.0	---
SO_2 Emission Rate (g/sec)	31.20	---
Particulate Emission Rate (g/sec)	11.47	1.74
Stack Height (meters)	88.40	88.40
Stack Diameter (meters)	3.90	1.50
Exit Temperature (degrees kelvin)	493	359
Exit Velocity (meters per second)	18.80	10.40

The application originally submitted on March 12, 1976, lacked sufficient data for a complete technical review. Requests were made accordingly, and the application revised as follows: March 31, corrected process parameters and emission rates; May 27, submission of an ambient air quality impact assessment (supplements attached). Additional modeling information was provided following the preliminary determination on October 13, November 3, and November 5, 1976, from Container Corporation.

These revisions resulted in particulate emission rates of 11.47 grams/second from the 99.7% efficiency electrostatic precipitator (recovery boiler exhaust) complying with the 0.044 gr/DSCF BACT requirement and 1.74 grams/second from the 99% efficiency wet scrubber (smelt dissolving tank exhaust) complying with the BACT requirement of 0.3 lb/ton of air dried pulp.

A reduction in baseline pollutant concentrations has resulted due to a mass cleanup campaign and the subsequent achievement of compliance with Florida regulations since 1974. Table II summarizes the results of this analysis showning the baseline values as well as the future predicted levels. As can be seen from this table, the allowable annual and short-term increments in concentrations of particulates and sulfur dioxies are not violated or consumed since the predicted air quality is below the baseline. Actual measured air quality data in the vicinity of the proposed facility is generally well below the national ambient air quality standards.

TABLE II

MAXIMUM CALCULATED ESTIMATED GROUND LEVEL SULFUR DIOXIDE & TOTAL SUSPENDED PARTICULATE CONCENTRATIONS (ug/m3) IN THE VICINITY OF CONTAINER COPORATION's FERNANDINA BEACH PAPER MILL

Emission Situation	Sulfur Dioxide (ug/m3)			Particulates (ug/m3)	
	Annual[a] Average	24-Hour[b] Maximum	3-Hour[b] Maximum	Annual[a] Geo Mean	24-Hour[b] Maximum
Baseline	17	250	762	40	46
Sources in Compliance (Projection Including Container's Incremental Contribution)	19	98	383	39	34
Class II Increments	15	100	700	10	30
Container's Incremental Contribution	3	26	117	2	2
Use of Increment*	-28	-152	-379	-1	-12

[a]Holland Plume Rise Equation, Calibration Slope of 1.0
[b]Briggs Plume Rise Equation, Calibration Slope of 1.0

*Minus values reflect the fact that no use of increment has been made, nor will be made until baseline is reached

Therefore, the construction of these two new emission sources can be approved with the necessary conditions to ensure compliance with BACT since the analysis has shown the PSD increments will be protected.