

ATTACHMENT 11

MEMORANDUM

TO: Penny Lassiter, EPA/WCPG

FROM: Danny Greene, Radian Corporation

DATE: February 29, 1996

REVIEWER: Roy Oommen, Radian Corporation

SUBJECT: Baseline Level of Controls

1.0 INTRODUCTION

The purpose of this memorandum is to present the basis of the baseline level of control for kraft, semi-chemical, soda, and sulfite pulping processes, and for paper-grade and dissolving-grade bleaching processes. The baseline level of control (i.e., what controls are being used in how many mills) will be used to identify the best performing sources, which will be used to determine the maximum achievable control technology (MACT). Table 1 presents the summary of baseline controls for pulping vents and wastewater streams while Table 2 presents the summary of baseline controls for bleaching vents. The summary tables reflect the controls that are frequently used by the industry to reduce emissions. Additionally, the summary tables present considerations for new source controls that are less frequently practiced by the industry.

Section 2.0 of this memorandum presents the information used to determine the baseline level of control for pulping and bleaching processes. Section 3.0 discusses additional data and memoranda used to develop the performance level of the control technologies or strategies identified in Section 2.0. Attachment A contains a summary of the principle data used in this analysis; these data were obtained using the 1992 National Council of the Paper Industry for Air and Stream Improvement, Incorporated (NCASI) voluntary mill survey (air docket A-92-40, item II-D-27). The survey was distributed to all mills by NCASI to obtain information for the development of pulp and paper MACT emission standards. The NCASI voluntary survey requested information regarding the number of emissions points and types of control for pulping, bleaching, and wastewater emission sources at chemical pulping mills. However, some additional industry comments and data have been used to supplement the information collected in the NCASI survey. This information is identified in the appropriate sections below.

Table 1. Summary of Pulping and Wastewater Baseline Controls (a)

Subcategory	Percent of Emission Points or Number of Mills with Controls in Place	Additional Considerations For Control at New Mills (in addition to existing source control)
Kraft	LVHC Vents (71-100%) control of Digester Evaporator Turpentine Recovery Steam Stripper Overheads Pre-washer Knotter/Screening System Vents (7-34%) Washer System Vents (9-17%) Weak Black Liquor Storage Tank Vents (9%) Oxygen Delineation System Vents (4 out of 10 systems)	Post-washer Decker System Vents (3-7%) (b) Post-washer Screening System Vents (3-51%) (b)
Sulfite	LVHC Vents (14 out of 14 mills) Digester Evaporator Washer System Vents (11 out of 14 mills)	Weak Liquor, Strong Liquor, and Acid Condensate Storage Tanks; Non-venting Knotter and Screening System Vents (2 out of 14 mills)
Semi-chemical	LVHC Vents (27-28%) Digester Evaporator	Washer System Vents (1 mill) No other downstream equipment controlled
Soda	LVHC Vents (none controlled) Digester Evaporator	Washer System Vents or other downstream equipment (none controlled)
Wastewater: Kraft	Route foul condensates to a steam stripper (32 out of 125 kraft mills)	Route all pulping condensates to stripping (no mills)
Wastewater: Sulfite, Semi-chemical, and Soda	No steam stripping used	No steam stripping used

a

The percent control ranges reflect non-venting equipment versus equipment that indicated control using a device. The high end of the ranges presented reflects the interpretation that non-venting equipment are considered to be controlled.

b

Control of these vents were not included in the list for existing sources due to questions on the accuracy of the reported numbers.

Table 2. Summary of Bleaching Baseline Controls

Bleach Plant Type	Chlorine Emissions	Chloroform Emissions	Emissions of Non-chlorinated HAP's
Paper-grade	Scrubbing of all chlorine/chlorine dioxide stage vents (100% of sequences)	High chlorine dioxide subst. (16% of sequences); No hypochlorite use (75% of sequences)	No control achieved through scrubbing. No other technologies being used.
Dissolving-grade		Varying degrees of substitution and hypochlorite use (EPA will determine specific values when the Office of Water evaluates the BAT option)	

2.0 BASELINE CONTROLS

This section describes data used to identify the baseline level of controls for pulping vents, bleaching vents, and pulping wastewater.

2.1 Pulping Vents

A summary of the percent or number of pulping mills controlling specific emission sources at baseline is included in Table 1. The determination of the baseline level of control for pulping vents was based primarily on the data collected using the NCASI survey. The percent of each type of emission point that is controlled was estimated by dividing the number of controlled points by the total number of similar emission points. Controlled emission points were determined based on the destination of the vent stream indicated in the survey (e.g., lime kiln, power boiler, etc.). Responses of "not vented" for an emission point were considered to be controlled. Responses that indicated a point was vented to the atmosphere or into a building were considered to be uncontrolled. Responses that indicated "not applicable" were not included in the total number of emission sources.

Additional industry data (e.g., trip reports, comment data) were used to supplement the information collected using the NCASI voluntary survey. For kraft mills, industry commented that the level of control of low volume - high concentration (LVHC) vents was higher than indicated in the voluntary survey (70 percent). Since kraft mills are subject to control requirements specified in the new source performance standards (NSPS) for kraft mills, virtually 100 percent control of the LVHC vents would be controlled. For sulfite mills, additional information used for determining the baseline level of control was submitted by the industry after proposal (docket items IV-D1-87 and IV-D1-88).

Questions remain on the interpretation of responses in the NCASI voluntary survey regarding control of emissions from pre-washing knotter/screening systems and post-washing systems at kraft mills; currently, control of post-washer decker and screening systems is not being considered as a control requirement basis for existing sources (as shown in Table 1). Industry is currently collecting information on pre-washing systems to determine if the accuracy of the data is correct for these systems.

2.2 Bleaching Vents

The information indicating the destination of bleaching process vents (e.g., scrubber, atmosphere, etc.) for determining the baseline level of control was collected in the NCASI survey. This information was also augmented with data collected in the 1990 National Census (docket item II-A-36) to characterize the level of chlorine dioxide substitution and hypochlorite application. In determining the level of control for bleaching vents, no distinction was made between the types of products made in the bleaching process (i.e., paper-grade or dissolving-grade).

2.3 Pulping Wastewater

The NCASI voluntary survey provided information detailing which mills control pulping wastewaters. This information was supplemented by a May 3, 1993 follow-up letter from NCASI (docket item IV-D-3). As shown in Table 1, the data indicated that a large number of kraft mills employ steam stripping of pulping condensates in addition to their biological wastewater treatment plant. The data also showed that non-kraft mills do not steam strip pulping condensates and only perform wastewater via their biological wastewater treatment plant.

The NCASI voluntary survey did not provide information on which condensates were being sent to a steam stripper at baseline. That information was later provided in the NCASI condensate study (docket item IV-J-32). The EPA's analysis used to identify and characterize the condensate streams that are typically controlled is discussed in a separate memorandum (docket item IV-B-9).

3.0 PERFORMANCE OF BASELINE CONTROLS

The performance of baseline controls is discussed in the December 17, 1993 proposed MACT standard (docket item III-A-2) and in a supplemental MACT notice anticipated to be published in the Federal Register on March 8, 1996. This section describes data and memoranda available regarding emission reduction performance achieved by the baseline control technologies or strategies identified in Section 2.0.

3.1 Pulping Vents

As indicated in the NCASI survey, kraft, semi-chemical, and soda pulping process emission sources are controlled by collecting and routing vent streams to combustion devices. The Background Information Document (docket number II-A-35) and the December 17, 1993 proposal present the rationale used to determine the hazardous air pollutant (HAP) destruction efficiency of combustion devices typically used in the industry (e.g., lime kilns, power boilers, etc.). Sulfite emission

sources are controlled by collecting and routing vent streams to either the acid making/chemical recovery system or a caustic scrubber (nuisance scrubber). A discussion of the analysis used to determine the performance level associated with sulfite mill control strategies is presented in a separate memorandum (Evaluation of Emissions from Sulfite Pulping, docket item IV-B-11).

3.2 Bleaching Vents

Bleaching processes achieve emissions reduction through a combination of caustic scrubbing and process modifications. The performance level of bleach plant scrubbers was evaluated based on information contained in NCASI technical bulletin 616 (Bleach Plant Chlorine and Chlorine Dioxide and Their Control, docket item II-I-24) and on industry data and comments submitted after proposal (water docket; item 20,027). Technical bulletin 558 (Results of Field Measurements of Chloroform Formation and Release from Pulp Bleaching, docket item II-I-10) was used to evaluate the performance associated with process modifications.

3.3 Pulping Wastewater

The performance of kraft mill steam strippers was evaluated based on data received from industry after proposal (water docket; item 20,027; attachment 3). A detailed discussion of the analysis of the baseline steam stripper performance parameters is presented in a separate memorandum (Steam Stripper Performance Parameters for Bleached and Unbleached Kraft Mills, docket item IV-B-10).