

United States EPA, Region IX  
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San Francisco, CA 94105

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Air Pollution Control Officer

**Attention: Steve Branoff**

RE: District Response to Comments on Proposed Title V Permit for Gaylord Container Corporation

Dear Mr. Branoff:

In light of comments submitted to the District on behalf of the International Brotherhood of Electrical Workers Local 302 and the Plumbers and Steamfitters Local Union 342, the District is withholding issuance of the proposed Title V permit for Gaylord Container Corporation. It has become evident that the papermaking operations at Gaylord have the potential to emit significant quantities of volatile organic compounds (VOC) and hazardous air pollutants (HAP) and therefore require a permit to operate from the District. In addition, the District has requested that Gaylord retest the Gas Turbine S-35 for formaldehyde emissions in order to determine MACT applicability. The Title V permit will be modified and resubmitted for approval by the EPA when all appropriate permits have been obtained and MACT applicability for the turbine has been determined.

**Background:**

On June 1, 2000, a notice inviting written public comments on the District's preliminary decision to issue a Major Facility Review Permit (Title V) to Gaylord Container Corporation was published in the Contra Costa Times. On June 28, 2000 Katherine S. Poole, an attorney for Adams, Broadwell, Joseph, & Cardozo, requested a 2 week extension to the comment period to allow her firm an opportunity to gather more information about the proposed permit. On June 30, 2000, the District granted a 30 day extension to the comment period.

On July 28, 2000, the District received comments on the proposed Title V permit for Gaylord from Adams, Broadwell, Joseph, & Cardozo on behalf of their clients, the International Brotherhood of Electrical Workers Local 302 and the Plumbers and Steamfitters Local Union 342 (Commenters). On August 2, 2000, the District forwarded a copy of the comments to Gaylord Container for a 30 day review period. Due to the number and complexity of the comments, Gaylord requested, and was granted by the District, an extension to the review period until October 6, 2000. On October 6, 2000,

Catherine Gilson of Farella Braun + Martel submitted a response to the comments on behalf of Gaylord.

**Response to Comments:**

In this section, the comment is summarized, followed by the commenters' argument, Gaylord's rebuttal, and the District's position on the comment.

**Comment #1: No PSD Permit was obtained for the Gas Turbine S-35 and Duct Burner S-36 when they were permitted in 1983.**

- Commenters' Argument

Gaylord should not have been allowed to net out of PSD by using emission reduction credits that were obtained from the shutdown of Power Boilers No. 1 and No. 2 at the paperboard mill.

The Gas Turbine and Duct Burner should have a Standard Industrial Code (SIC) of 4931 (electric and other services combined), while Gaylord's pre-existing recycled linerboard operations fall into SIC 2631 (paperboard mills). Therefore, since the Power Boilers had a different SIC, the emission reduction credits could not be applied to the Gas Turbine and Duct Burner.

- Gaylord Rebuttal

The Gas Turbine/Duct Burner is a support facility for the paperboard production operations. A support facility is considered part of the same stationary source as the production facility it supports. It is therefore irrelevant that the two operations, when considered separately, have a different SIC. (Ref. NSR Manual p.A.3)

- District Position

The District stands by the 1983 decision to allow contemporaneous emission reduction credits from the shutdown of Boiler No. 1 and Boiler No.2 to be used to reduce net emissions from the Gas Turbine/Duct Burner. As a result, PSD requirements were not triggered.

**Comment #2: BACT was not applied to the Gas Turbine S-35 in 1983.**

- Commenters' Argument

BACT was not imposed for S-35 because, to comply with PSD requirements, BACT must be met on a continual basis at all levels of operation, including startup and shutdown. The NOx limit imposed in 1983 and now included in the Title V permit exempts compliance with the limit during start up periods (not to exceed 4 hours). Therefore, since there are no NOx limits in place during periods of startup or shutdown, the Gas Turbine does not comply with PSD BACT requirements.

- Gaylord Rebuttal

Since the facility netted out of PSD by shutting down Boiler No.1 and Boiler No. 2, PSD BACT was not triggered.

- District Position

PSD BACT was not triggered because the facility netted out of PSD requirements. The District applied NSR BACT to the source in a manner consistent with District policy at the time. Furthermore, BACT does not require the impossible. Startup and shutdown have long been recognized as operating conditions that merit different treatment than base operations.

**Comment #3: BACT was incorrectly applied to the Duct Burner S-36 in 1983.**

- Commenters' Argument

The District accepted low NOx burners as BACT for S-36 without considering two other technologies capable of achieving lower NOx emissions that were available at the time; SCR and thermal DeNOx. In order to rule out technologies that represent more stringent levels of control, it must be demonstrated that implementing the technology would cause unreasonable adverse energy, environmental, or economic impacts. No such demonstration was made. (Ref. Memorandum from David G. Hawkins, Assistant Administrator for Air, Noise, and Radiation, to Regional Administrators, Re: Guidance for Determining BACT under PSD, Jan. 4, 1979)

- Gaylord Rebuttal

PSD BACT was not triggered.

- District Position

PSD BACT was not triggered because the facility netted out of PSD requirements. The District applied NSR BACT to the source in a manner consistent with District policy at the time.

**Comment #4: Gaylord was required to obtain enforceable CO limits in 1983.**

- Commenters' Argument

The combined CO emissions from the Gas Turbine and Duct Burner exceeded 100 tons per year and required the application of the lowest achievable emission rate (LAER). However, Gaylord's permits do not contain any limit for CO.

- Gaylord Rebuttal

Because Gaylord appropriately "netted out" of major source review, the facility was not required to obtain limits on CO emissions. LAER was not triggered.

- District Position

LAER was not triggered in 1983 because the net increase of CO emissions from the Gas Turbine/Duct Burner was less than 100 tons per year. In permit application #28179, it was determined that overall CO emissions from the Gas Turbine/Duct Burner combination would be 109.4 tons/yr and that net CO emissions after reductions achieved from the shutdown of Power Boilers No. 1 and No. 2 would be 78.9 tons/yr.

A permit condition limiting the combined CO emissions from the Gas Turbine S-35 and the Duct Burner S-36 to 109.4 tons/yr will be added to enforce the 1983 decision.

**Comment #5: Subsequent Modifications of the Steam Electric Plant triggered BACT for CO.**

- Commenters' Argument

The Title V permit submitted in September 1995 indicates that the CO emissions from the gas turbine increased from 44 tons per year in 1983 to 193 tons per year. This increase should have triggered PSD BACT requirements for CO at the time it was first reported, in September of 1995.

- Gaylord Rebuttal

None.

- District Position

BACT was not triggered for CO by modifications to the Gas Turbine subsequent to the 1983 permit. As the Commenters' Argument points out, Gaylord reported CO emissions of 193.24 tons/yr in their September 1995 Title V application. However, this number was based on a standard combustion emission factor contained in the District's Data Bank, which is not specific to the Gas Turbine S-35. Based on the results of several District source tests, there is no indication of an increase of CO emissions since 1983 or CO emissions exceeding the baseline of 109.4 tons/yr.

For Example:

District source testing has found CO emissions from the Gas Turbine/Duct Burner combined emissions stream as follows:

<u>Test Date</u>	<u>Report No.</u>	<u>CO Emissions (ppmv @ 15% O<sub>2</sub> dry)</u>
01/07/94	64-94	12.8
07/13/94	04-95	27.3
10/06/95	33-96	5.4
03/20/96	106-96	6.4
05/06/97	132-97	6.7
12/23/97	71-98	11.5
08/18/98	14-99	24.0
06/25/99	154-99	19.3
04/28/00	135-00	8.5

Based on the results of these nine District source tests, the average CO emission concentration from the combined Gas Turbine/Duct Burner exhaust stream is 13.5 ppmv (dry) @ 15% O<sub>2</sub>. Applying EPA methodology from 40 CFR 60, Appendix A, Method 19, the following equation can be used to determine mass emissions based on fuel consumption:

$$E = C_d F_d \times [20.9 / (20.9 - \%O_2 \text{ dry})]$$

where:

$$E = \text{CO Emission Rate (lb/MMBTU)}$$

$$C_d = \text{Dry CO Concentration (lb/scf)}$$

$$= (\text{ppm CO} \times 28 \text{ lb/lb-mole}) / (385 \text{ scf/lb-mole})$$

$$= [(13.5 \times 10^{-6}) \times 28] / 385$$

$$= 9.82 \times 10^{-7} \text{ lb/scf}$$

$$F_d = 8,710 \text{ scf/MMBTU (EPA f-factor for natural gas combustion)}$$

$$E = (9.82 \times 10^{-7} \text{ lb/scf}) \times (8,710 \text{ scf/MMBTU}) \times [20.9 / (20.9 - 15)] \\ = 0.03 \text{ lb/MMBTU}$$

The Gas Turbine S-35 has a maximum firing rate of 457 MMBTU/hr (4,003,320 MMBTU/yr) and the Duct Burner S-36 has a maximum firing rate of 146 MMBTU/hr (1,278,960 MMBTU/yr). Therefore, with a combined potential heat input of 5,282,280 MMBTU/yr and a combined emission factor of 0.03 lb/MMBTU, the potential CO emissions from S-35 and S-36 are 158,468 lb/yr or 79.23 tons/yr.

In the 1983 Evaluation Report, CO emissions from the Gas Turbine S-35 and Duct Burner S-36 were estimated to be 44 tons/yr and 65.4 tons/yr respectively. If the combined emission of 109.4 tons/yr CO is compared to the 79.23 tons/yr CO combined emission based on recent source tests, it is clear that CO emissions from the Gas Turbine have not increased.

**Comment #6: The startup of Power Boiler No. 1 in 1995 triggered LAER for VOC's from the Paper Building.**

• Commenters' Argument

Gaylord shutdown Power Boiler No. 1 in 1981, then replaced the steam source in 1983 by installing the cogeneration facility (i.e. Gas Turbine/Duct Burner). The emission reductions from the boiler shutdown were used to net the cogeneration facility out of PSD review as previously discussed. In 1994, Gaylord filed to re-permit Power Boiler No. 1, retrofit to meet BACT requirements and offset by emission reduction credits from the now closed Kraft Pulp Mill. However, the increased steam output, which allowed an increase of linerboard production at the paperboard mill, was not considered. The increased linerboard production capacity is estimated to be 700 tons/day.

Studies of paper making processes by the National Council of the Paper Industry for Air and Stream Improvement (NCASI) indicate that nonchemical pulp mill paper machines processing 100% secondary fiber emit VOC's in a range of 0.23 to 0.77 pounds per air dried ton of finished product (ADTFP), with the median VOC emission rate being 0.37 lb/ADTFP. Assuming increased steam capacity raised the linerboard production capacity by 700 tons per day, an increase of VOC emissions of 259 lb/day or 47.3 tons/yr would result. This should have triggered BACT and Offsets under District Regulation 2, Rule 2.

- Gaylord Rebuttal

The Commenters' Argument overstates the impact on papermaking operations that restarting Boiler No. 1 actually had. Prior to restarting the boiler, the papermaking capacity was 1,000 tons/day. The capacity then increased to 1,125 tons/day after the boiler was restarted (i.e. a 125 ton/day increase). Using the NCASI median VOC emission factor of 0.37 lb/ADTFP (as suggested by the Commenters' Argument), the potential VOC increase would be 6.75 tons/yr. Since 6.75 tons/yr is well below the significance threshold for VOC emissions, BACT and Offsets were not triggered under District Regulation 2, Rule 2.

- District Position

1. Gaylord needs a permit to operate the papermaking operations at the facility.
2. VOC emissions from increased paper production capacity as a result of restarting Boiler No. 1 are subject to new source review.

The referenced NCASI report "Volatile Organic Compound Emissions from Non-Chemical Pulp and Paper Mill Sources – Part V – Paper Machines" was not published until 1997. Therefore, neither Gaylord nor the District could have used this information to make determinations about increased VOC emissions from papermaking operations in 1995. However, as the information is now available, it appears that VOC emissions from papermaking operations at Gaylord have been overlooked.

According to Gaylord, papermaking capacity went from 1,000 tons/day to 1,125 tons/day. Applying the NCASI median VOC emission factor of 0.37 lb/ADTFP, potential VOC emissions from papermaking would have gone from 67.5 tons/yr to 76.0 tons/yr. An increase of 8.5 tons/yr (46.6 lb/day) VOC would trigger BACT (because BACT is triggered by an increase of more than 10 lbs/day) and Offsets under District Regulation 2, Rule 2.

**Comment #7: Methanol emissions from increased paper production trigger MACT requirements.**

- Commenters' Argument

The NCASI has published a methanol emission factor of 0.1 lb/ADTFP for Nonchemical Pulp and Paper Machines using 100% Secondary Fiber. Based on this emission factor and the assumption that the restart of Boiler No. 1 increased paper production by 703 tons/day, methanol emissions

have increased by 12.8 tons/yr. Therefore, since methanol is a HAP and increased emissions are >10 tons/yr, MACT is triggered.

- Gaylord Rebuttal  
MACT was not triggered by restarting Boiler No. 1 because the paper production increase was 125 lb/day not 703 lb/day. Using the NCASI methanol emission factor of 0.1 lb/ADTFP, the increased methanol emissions would have been 2.3 tons/yr, below the 10 ton/yr single HAP MACT trigger.
- District Position  
The papermaking operations at Gaylord require a permit to operate from the District. MACT applicability will be evaluated during the permit process.

**Comment #8: The Title V Permit does not contain enough information to determine whether MACT applies to several papermaking processes at the facility.**

- Commenters' Argument  
The pulp and paper production MACT rule subcategorizes the industry to specify different emission standards based on the type of pulping process (Kraft, sulfide, semi-chemical, soda, mechanical wood pulping, secondary fiber pulping, or non-wood pulping) and bleaching processes (paper grade or dissolving grade). EPA further subcategorizes bleaching processes according to the specific chemical or chemical class (chlorine, chlorine dioxide, sodium hypochlorite, non-chlorine) used by a facility. Information provided to the District in the Title V application and all historic permit files was insufficient to determine the type of papermaking operations used. Therefore, it is impossible to determine whether the MACT standards apply.
- Gaylord Rebuttal  
Gaylord has made clear that it is classified under SIC Code 2631, paperboard mill, and that it produces unbleached containerboard products from 100% secondary fiber. This description is adequate.
- District Position  
The papermaking operations at Gaylord require a permit to operate from the District. MACT applicability will be evaluated during the permit process.

**Comment #9: Limits should be placed on the type and amount of paper that can be produced at the facility.**

- Commenters' Argument  
Because there are no specific limitations on Gaylord regarding the type or amount of paper they can produce, further expansion or a product change may subject the facility to additional MACT requirements.

- Gaylord Rebuttal  
Gaylord is no longer capable of operating a Kraft pulping facility and there is no hidden opportunity to expand existing operations.
- District Position  
The papermaking operations at Gaylord require a permit to operate from the District. Appropriate limits on papermaking operations will be added as part of the permit process.

**Comment #10: The Gas Turbine triggers MACT. HAP compounds were excluded.**

- Commenters' Argument  
Gaylord understated HAP emissions from the Gas Turbine in the Title V application because only benzene and formaldehyde were included and numerous other HAPs in gas turbine exhaust have been identified by the EPA and CARB.
- Gaylord Rebuttal  
The Title V application does not suggest that formaldehyde and benzene are the only HAPs emitted from the turbine. However, the number and character of other HAPs emitted by the gas turbine is irrelevant, for the purposes of determining whether MACT is triggered. According to the applicable emissions factor included in AP-42, formaldehyde represents nearly 2/3 of all HAPs present in the emissions from a gas turbine. (Ref. EPA AP-42, 3.1.3.5)
- District Position  
The Title V application was sufficient in regards to HAP emissions from the Gas Turbine. Gaylord provided information pertaining to formaldehyde emissions from the turbine which, according to AP-42 is a key indicator of overall HAP emissions.

**Comment #11: The Gas Turbine triggers MACT. Partial load operation was not considered.**

- Commenters' Argument  
Gaylord's estimate of formaldehyde emissions (0.8 lb/hr) is based on a source test performed during full load operation. According to a study performed by the Gas Research Institute (GRI) and the Electric Power Research Institute (EPRI), "Gas-Fired Boiler and Turbine Air Toxics Summary Report", emissions of formaldehyde increased by a factor of 146 for a GE Frame 7 turbine when turbine output was reduced from a maximum to a minimum load.

Using GE Frame 7 data from the GRI/EPRI study, a relationship was developed between percent load and formaldehyde emission factor as follows:

<b>Percent Load</b>	<b>Formaldehyde Emission Factor (lb/10<sup>12</sup> BTU)</b>
100%	15.3
70%	47.0
50%	175.0
30%	7,539.0

$$\ln(y) = 1.89 + 1157/x^{1.5}$$

where:

- y = formaldehyde emission factor (lb/10<sup>12</sup> BTU)
- x = percent load

This relationship was used to determine how many times greater the formaldehyde emission factor would be at any given load level than it is at 100% load. These emission factor multiples were then applied to the Gaylord turbine at various load levels (derived from actual operating data) assuming that the 100% load emission factor was 0.8 lb/hr. This resulted in calculated formaldehyde emissions of 11.86 tons/yr. (See Table 1 of Comments)

- Gaylord Rebuttal  
The Commenters' Argument exaggerates the impact of low load formaldehyde emissions for Gaylord's operations.
- District Position  
The Commenters' formaldehyde emissions estimates are exaggerated. The evidence presented does not demonstrate that the Gaylord turbine triggers MACT.

Methodology used by the Commenters misinterprets the GRI/EPRI report. First, the 100% load emission factor reported for the Frame 7 turbine is orders of magnitude below that which they are assuming for the Gaylord turbine. Using the 100% load emission factor from the GRI/EPRI study, the Gaylord turbine (457 MMBTU/hr, 0.000457 x 10<sup>12</sup> BTU/hr), would have formaldehyde emissions of 0.007 lb/hr, not 0.8 lb/hr. Therefore, the Frame 7 data reported in the GRI/EPRI report can not be compared to the Gaylord turbine.

Secondly, examination of the GRI/EPRI report data reveals that the low-load formaldehyde emission rate is fairly similar for all of the turbines tested. The principal difference between the various units tested is in the high-load emission rates. Some of the units show a large reduction in formaldehyde emissions at high loads; others show a modest reduction, or even an increase. Gaylord's test data indicates that it is in the latter group. The reasonable application of the GRI/EPRI report data to the Gaylord turbine predicts an emission response curve matching those of

the other high-load, high-emitting units. Therefore, the Commenters' premise that formaldehyde emissions from the Gaylord turbine increase by a factor of 146 times from full load to minimum load can not be validated.

**Comment #12: The Gas Turbine triggers MACT. Dry low NOx combustors increased formaldehyde emissions.**

- Commenters' Argument

The source test used to estimate formaldehyde emissions in the Title V application was conducted in 1992. The turbine was retrofitted with a dry low NOx burner in 1996, long after the source test. The GRI/EPRI report previously discussed indicates that a low NOx combustor increases emissions of formaldehyde by a factor of 6.6 during full load and by a factor of 11.4 during reduced load, compared to the same turbine without a low NOx combustor. Therefore, if the turbine was emitting 12 tons/yr of formaldehyde prior to the low NOx combustor retrofit, it must be emitting 78 tons per year now.

- Gaylord Rebuttal

Gaylord believes it is more reasonable to rely upon the results of a source test conducted at its facility, than general emission factors, since source tests appropriately reflect site-specific conditions.

- District Position

The Gas Turbine S-35 should be source tested for formaldehyde at various load levels in order to establish a relationship between percent load and formaldehyde emissions for this turbine. The 1992 Geraghty & Miller source test is no longer valid because a dry low NOx combustor was added in 1996 and there is sufficient evidence to suggest that that dry low NOx combustors may increase formaldehyde emissions. The applicability of MACT for the Gaylord turbine will be determined based on actual source test results.

As previously noted, the District does not agree with the use of GE Frame 7 turbine data from the GRI/EPRI report to determine formaldehyde emissions from the Gaylord turbine.

**Comment #13: A Startup, shutdown, and malfunction plan is required.**

- Commenters' Argument

Since MACT is triggered for the linerboard mill and the gas turbine, Gaylord must develop and implement a written startup, shutdown, and malfunction plan. This plan shall be incorporated by reference into the Title V permit.

- Gaylord Rebuttal

Contrary to the Commenters' assertions, specific limitations regarding operation during startup, shutdown, and malfunction are incorporated into the proposed permit, ensuring that the Facility will not produce excess emissions during such periods. Moreover, these limitations are reinforced by

Gaylord's plant-wide operating policies and procedures, which instruct that all equipment is operated safely, efficiently, and with the least environmental impact at all times.

- District Position

MACT is not triggered for the Gas Turbine, but may be for the papermaking operations. The issue of a startup, shutdown, and malfunction plan will be addressed during the permitting of the papermaking operations.

**Conclusion:**

Gaylord's 1995 Title V submittal was not deficient as the Commenters have claimed. Based on the information available to them at the time, nothing necessary to determine the applicability of, or to impose any applicable requirement was omitted. However, new information has since been presented that has given the District reason to withdraw Gaylord's Title V permit from consideration until modifications have been made. The 1997 study "Volatile Organic Compound Emissions from Non-Chemical Pulp and Paper Mill Sources" performed by the NCASI suggests that there are significant VOC and HAP emissions associated with the type of papermaking that Gaylord employs. Also, because the formaldehyde source test for the Gas Turbine S-35 is no longer valid due to source modifications, a retest is required.

**Recommendations:**

It is recommended that the proposed Title V permit for Gaylord Container Corporation be withdrawn from consideration until such time as a permit to operate is obtained for the papermaking operations at the facility, the Gas Turbine is retested for formaldehyde, and subsequent modifications to the Title V permit have been made.

If you have any questions or comments, please call Ted Hull at (415) 749-4919.

Very Truly Yours,

William De Boisblanc  
Director of Permit Services

WDB:th

cc: Katherine Poole; Adams, Broadwell, Joseph, & Cardozo  
Diana Hogan; Gaylord Container Corporation  
Peter Venturini, California Air Resources Board