

Appendix 11c-K: Additional Documentation of Point Source VOC and NO_x Reductions

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HGA Post-'96 ROP Point Source VOC Emission Reductions from Pulp & Paper Mills

Table: Creditable VOC Emission Reductions 1990-1999 from Pulp & Paper Mills K-1

Explanation for Creditable VOC Emission Reductions from Pulp & Paper Mills Table K-2

HGA Post-'96 ROP Point Source NO_x Emission Reductions from Chapter 117 NO_x RACT

Table: NO_x RACT Emission Reduction Credits for the 1999 9% Rate-of-Progress SIP for
Houston/Galveston Nonattainment Area Calculated by Point Source Category K-3

Explanation for NO_x RACT Reductions for 9% SIP Table K-4

CREDITABLE VOC EMISSION REDUCTIONS 1990-1999 FROM PULP & PAPER MILLS IN HGA - Revised 4/17/98

Company Name/ Account Number	Emission Source	1990 Emissions (tpy)	Description of Emission Controls	Federally Enforceable Requirement	1996 Emissions (tpy)	1999 SIP Creditable Reductions (tpy)	1999 SIP Creditable Reductions (tpd) ¹
Champion Sheldon HG-0674-D	Thermomechanical Pulping (TMP) FIN #s 2000 & 2100	604.7 ²	Turpentine recovery system & Incinerator	Amendment to Permit R-190 Issued 1994, limits emissions to 50 tpy	2.4 ³	604.7 -50.0 = 555	1.52
Champion Sheldon HG-0674-D	Tall Oil Plant FIN # 7100	78.0	Incinerator	30 TAC §115.122 (a)(1) requires 90% reduction ⁴	7.28	78-7.8 = 70	0.19
Simpson Pasadena HG-0129-K	Brown Stock Wash Operations FIN #s BSW-A, B, & C - ROW	212.1 ⁵	Vent Gas Collection System & Thermal Oxidizer/Scrubber	Amendment to Permit #20619, issued 1998, limits emissions to 9 tpy	151.51	212.1 - 21.2 ⁶ = 190.9	0.52
Simpson Pasadena HG-0129-K	Bleaching Operations	25 ⁷	New Process Reduces VOC ⁸	Amendment to Permit #20619, issued 1998, limits emissions to 11 tpy	48.44	0 ⁹	0
	Δ Emissions 1990 (Revised-Original)	485.7 (1.33 tpd)				Total Creditable Reductions	2.2

Explanation for Creditable VOC Emission Reductions from Pulp & Paper Mills Table:

1. Tons per ozone day emissions (daily average emissions from June through August) are calculated by dividing annual tons per year by 365, since activity levels are roughly equal throughout the year.
2. Emissions in the 1990 base year inventory, adopted October 27, 1993, were 306.1 tpy. This value reflected emission data collected in a 1993 Texas Paper Industry Environmental Committee (TPIEC) study, which produced Method 18 speciated test data. The listed value is from the R-190 permit amendment application to control this source. The new number was developed from additional engineering analysis in preparation of the amendment application. The commission evaluated this information in its permit review.
3. Control system, installed in 1994, reduces emissions more than 99% in practice.
4. VOC emissions from this source were recognized in 1993 (and included in the 1990 base year inventory adopted in 1993), based on the TPIEC emission study. The emission rate subjected the source to the vent gas control rule, and an incinerator was constructed in 1994 and placed in operation in 1995.
5. These emissions reflect the portion of 1990 washing emissions from vents which would be subject to the lower exemption for pulp and paper sources in the Chapter 115 vent gas rule (compliance date is 11/15/99). The 1990 base emissions for these sources has been recalculated using the 1995 National Council on Air & Stream Improvement's (NCASI) emission factors.
6. The new washroom, starting up in the Spring 1998, will reduce wash operation emissions to a maximum of 9 tpy in 1999, as required by federally enforceable permit #20619. In order to maintain some emission reduction credits for future new source projects, Simpson has chosen to reserve a portion of the permit #20619 reduction credits for this purpose. For this SIP, the permit #20619 reduction credits provided (and hence required) are equal to the emission reductions which would be obtained from these vents by the 11/15/99 Chapter 115 vent gas rule.
7. Review of bleaching emissions using the 1995 NCASI emission factors and current process knowledge indicates that VOC emissions were overestimated in 1990. A detailed re-evaluation of 1990 base year emissions is not available, so no downward adjustment to the total base inventory is made. Downward adjustments to the base year inventory would decrease the ROP reduction target.
8. VOC emissions from chlorine bleaching will be reduced because of process modification and new construction. The new bleaching unit will substitute chlorine dioxide and peroxide for chlorine.
9. In April 1998, the new bleaching unit was under construction, but it will not be in operation by 11/15/99.

NO_x RACT EMISSION REDUCTION CREDITS FOR THE HGA 1999 9% RATE-OF-PROGRESS SIP
CALCULATED BY POINT SOURCE CATEGORY - Revised 4/17/98

Category	1990 ¹ Emissions (tpd)	% of Total Point	Chapter 117 Reductions (%; tpd)	Rule Penetration ²	Typical or Overall Control Efficiency (T:/O:)	Rule Effectiveness ³
Utility Boilers						
Gas Wall-fired	149		15%; 22 tpd	100%	O: 5-10% ⁴	--
Gas Tangential-fired	13		0%; 0 tpd	100%	0%	
Coal Wall-fired	45		0%; 0 tpd	100%	0% ⁴	
Coal Tangential-fired	35		0%; 0 tpd	100%	0% ⁴	
Total Utility Boilers	242	30	9%; 22 tpd			
Gas Turbines ⁵	191	24	16% ⁶ ; 30 tpd	not done 90+%	T: 50% ⁷	--
Industrial Boilers	120	15	10% ⁸ ; 12 tpd	not done 80+%	unknown/var	--
IC Engines						
Rich-burn (40%) ⁹	41		75% ¹⁰ ; 31 tpd	97%	T: 90%	--
Lean-burn (60%)	63		0%; 0 tpd	0%	0%	
Total IC Engines	104	13	30%; 31 tpd			
Process Heaters	101	13	0%; 0 tpd	not done	0% ¹¹	--
Other	37	5	0%; 0 tpd	0%	0%	--
Overall Point Source	795	100	12%; 95 tpd	not done	unknown	--

Explanation for NO_x RACT Reductions for 9% SIP Table

1. 1990 Emissions by source category: the 1990 EI hasn't been analyzed in detail to categorize the emissions into source categories yet. These percentage apportionments are from the 1993 data used in Table 9c-H-5.

Overall Point Source emissions: These are the 1990 base year emissions, adjusted for growth to 1999. The base year emissions are from the 1990 Base Year Ozone Nonattainment SIP EI, adopted October 27, 1993. To these emissions of 780.65 tons per ozone day (daily average emissions for the June-August period), the emissions from Enron's Texas City cogeneration plant were added (TNRCC account number GB-0153-Q). The emissions from this source inadvertently were not entered into the 1990 data base, although the EI questionnaire was properly submitted by Enron and quality assured by Air Board staff. The reported NO_x emissions from the Enron account in 1990 are 4850.4 tons per year, or during the June-August period, 14.2 tpd. The new total of 795 tpd was projected for growth to 1999, using a reduction of 10.39%, which is the growth estimate factor contained in the memo from Kathy Pendleton, in Appendix 11-J of this SIP.

2. Rule penetration represents the percentage of the total emissions in the category which have an applicable emission limit in Chapter 117.
3. More information needs to be developed over time before rule effectiveness can be estimated.
4. The following is an analysis of Chapter 117 reductions from the electric utility power boilers operative in the 1990's.

HL&P uses 19 natural gas-fired power boilers in the area, which, under a gas system-wide average compliance approach, were considered by HL&P and TACB in 1993 to require a system average reduction from 0.23 to 0.20 pound NO_x/MMBtu. This would be a 13% reduction, except that HL&P has consistently said they would need to control to levels below the limit to ensure compliance under all circumstances. Evaluation of current acid rain data may indicate that these boilers were emitting at 0.20 in 1996, but this data is on an annual average. Further analysis of the acid rain data will be required to determine the difference between the maximum 30-day system emission rate and the annual rate. Since load is seasonal, there is a difference. Since only three of the boilers had NO_x CEMS in 1993, it is impossible to determine with the accuracy available today of what the 1990 30-day or annual emission rates were. Now, there is a high degree of accuracy in measured NO_x emissions due to the EPA acid rain program CEMS, with complete annual data available for 1996 and later. HL&P hasn't installed any NO_x RACT emission controls yet. Their control plans have been scaled back, but still they still anticipate installing 4-6 induced FGR systems, increasing recirculation on 4 existing FGR fans, and using more burners-out-of-service firing patterns for Chapter 117 compliance, giving them at least a 15% system-wide emission rate reduction.

Entergy uses 2 wall-fired, natural gas fueled boilers in the area, at the Lewis Creek plant. 1990 emissions from these boilers were reported as 2300 tpy in 1990. These units do not need to reduce emissions to comply with Chapter 117.

HL&P has four coal-fired units in the area, at the W. A. Parish plant. Using a coal system-wide average compliance approach, these units were not thought by HL&P or the TACB to need to reduce emission rates to comply with Chapter 117.

5. Includes 4 tons per day from industrial boiler natural gas cogeneration (duct burners).
6. Initial estimate based on analysis of initial control plans submitted in 1994.
7. The 1990 emission rates vary among turbines, based on a number of factors, including if/when permitted. The 50% estimated reduction applies to the large electric generating turbines which were permitted at around 90-100 ppm NO_x, but assuming that some overcontrol is normally occurring to dispose of excess steam, are assumed to be emitting on average, 84 ppm. The Chapter 117 emission limit for these sources is 42 ppm, hence 50% reduction is typical.
8. Does not reflect analysis of initial control plans.
9. Split between rich-burn and lean-burn engine emissions is based on detailed Houston/Galveston engine population.
10. Chapter 117 emission limit represents about 90% control; rough adjustment for engines already controlled by New Source Review requirements and rule exemptions. Estimate does not reflect full analysis of inventory and initial control plans.
11. On aggregate, the Chapter 117 emission limits for process heaters may be higher than actual emission rates.