

## Appendix BD - BACT Determination

STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
NOTICE OF FINAL AMENDED PERMIT

In the Matter of an  
Application for Permit


Mr. George D. Woodward, Plant Manager  
Wheelabrator Ridge Energy, Inc.  
3131 K-Ville Avenue  
Auburndale, Florida 33823

DEP File No. AC53-206244  
PSD-FL-183

Enclosed is the FINAL Amended Permit AC53-206244 and PSD-FL-183 to construct a wood/tire/landfill gas power generation facility at State Road 542 and Taylor Road near Auburndale, Polk County. The final amended permit incorporates the Final Best Available Control Technology Determination (BACT) and revisions of permit conditions as a result of increased utilization of tires as fuel. This permit is issued pursuant to Section 403, F.S.

Any party to this order (permit) has the right to seek judicial review of the permit pursuant to Section 120.68, F.S., by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Legal Office; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 14 (fourteen) days from the date this Notice is filed with the Clerk of the Department.

Executed in Tallahassee, Florida.

  
C.H. Fancy, P.E., Chief  
Bureau of Air Regulation


### CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this NOTICE OF FINAL PERMIT (including the FINAL permit) was sent by certified mail (\*) and copies were mailed by U.S. Mail before the close of business on 2-14-97 to the person(s) listed:

Mr. George D. Woodward \*  
Mr. Brian Beals, EPA  
Mr. John Bunyak, NPS  
Mr. R. Harwood, Polk County  
Mr. Matt Killeen, WREI  
Mr. Bill Thomas, SWD

Clerk Stamp

**FILING AND ACKNOWLEDGMENT FILED**, on this date, pursuant to §120.52(7), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

 2-14-97  
(Clerk) (Date)

## Appendix BD - BACT Determination

### Best Available Control Technology (BACT) Determination Ridge Generating Station Polk County (REVISED FOR FINAL PERMIT LIMITS)

In 1992 the Department issued a permit to construct a 50 MW power generation facility named the Ridge Generating Station (RGS) and located near Auburndale in Polk County, Florida. The facility consists of a solid fuel boiler, steam turbine, generator and associated equipment. Fuel for the facility consists of a mixture of waste wood and scrap tires.

A BACT determination was required for all regulated air pollutants emitted in amounts equal to or greater than the significant emission rates listed in Table 212.400-2 of Florida Administrative Code (F.A.C.) Rule 62-212.400. The Department issued the construction permit with preliminary emission limits under the condition that final emission limits would be established following completion of a comprehensive emissions testing program conducted by the permittee. This revised BACT determination is pursuant to that permit condition.

The permittee proposed final emission limits based on a statistical analysis of the comprehensive test program results covering the period from September 1, 1994, through April 30, 1995. During this period, the full range of permitted fuels were fired ranging from 100% wood-0% tires to 60% wood-40% tires. Compared to those proposed limits below are the current "interim" permitted limits based on maximum emissions for the worst case fuel mix of 60% wood-40% tires. Also shown are the average actual and maximum emissions determined by the Department from the RGS data for operation under the worst-case condition of firing 60% wood-40% tires at 90-100% of permitted capacity (45-50 MW) during the period from March 1, 1995 through April 30, 1995.

Pollutant	Maximum Allowable Emissions (All Fuels)				60% Wood-40% Tires		
	RGS Proposed Final*		Interim Permitted		Test Program Actuals		
	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	lb/hr	tons/yr
					Avg.	Max.1-hr	Avg.
PM/PM10	12.6	55.2	12.6	55.2	1.2~	2.1~	5.3~
SO2	96.0	420.5	72.0**	315.4	75.0^	213.5^	328.5^
NOx	94.5	413.9	94.5	413.9	83.2^	153.1^	364.4^
CO	230.0	1,007.4	315.0	1,379.7	76.4^	447.2^	334.6^
VOC	22.1	96.8	22.1	96.8	1.4~	1.7~	6.1~
HCL	5.0	22.1	5.0	22.1	0.4~	0.7~	1.8~
Hg	0.022	0.097	0.022	0.097	8.6~"	9.1~"	37.7~"
Pb	0.25	1.1	0.25	1.1	9.3~"	40.0~"	40.7~"
Be	0.0063	0.03	0.0063	0.03	1.8~'	1.8~'	7.9~'

\* Based on 24 hr. block averages of CEMS data over 8 month period.

\*\* 30-day rolling average (amended for firing of 60% wood-40% tires).

~ Based on averages of two quarterly manual stack tests.

^ Based on total CEMS average for worst-case operation over 2 month period.

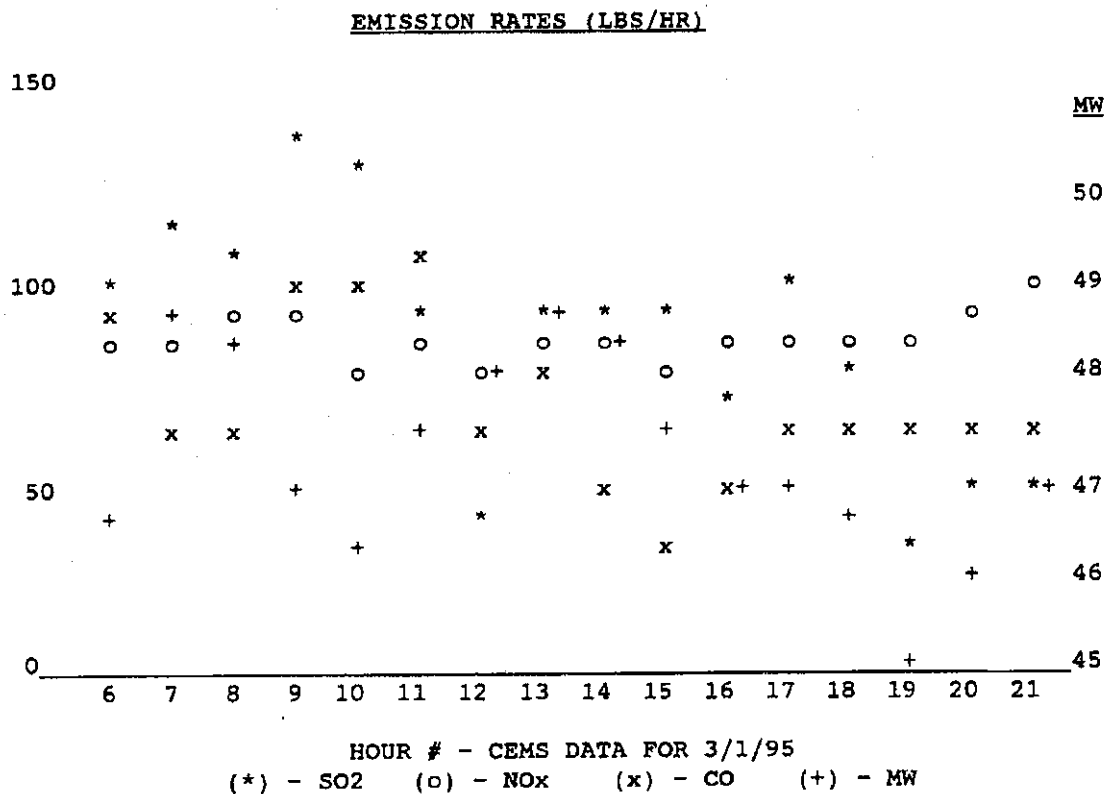
" Multiply by 0.0001.

' Multiply by 0.00001.

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The SO<sub>2</sub> emissions varied greatly compared to the fluctuations in NO<sub>x</sub> emissions, indicating far better response and control for the SNCR system relative to the Spray Dryer-Absorber/Fabric Filter system. Wide variation in CO emissions occurred but this was expected due to the nature of the feed. The response of the SO<sub>2</sub> control system appears to lag considerably behind changes in megawatts produced. This can be seen below from the operating data for the longest sustained operating period at 90-100% of capacity while firing 60% wood-40% tires (about 16 hours). Other operating cycles of less duration showed similar variations:



In establishing initial limits based on 24-hour averages, the Department did not know that the fluctuation in emissions would be great enough to justify longer-term averages in setting final limits. Also, it was not known initially that periods of continuous operation of the RGS boiler at full capacity would be so short relative to boilers firing more conventional fuels. For these reasons, the Department has proposed final emission limits based on 30-day rolling averages. Listed below are the 30-day rolling averages calculated by the Department for the worst case condition (60% wood-40% tires), assuming that no interruptions had occurred in normal operation during the 30 days following initial firing with 40% tires through the final day of the test program on April 30.

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30-DAY ROLLING AVERAGE EMISSION RATE (LBS/HR)  
FOR 3/30/95 - 4/30/95 (60% WOOD-40% TIRES)

<u>DATE</u>	<u>SO2</u>	<u>NOx</u>	<u>CO</u>
3/30	57.9	80.1	98.4
3/31	57.1	80.3	99.0
4/1	57.9	80.8	101.6
4/2		BOILER DOWN	
4/3		" "	
4/4		" "	
4/5		" "	
4/6		" "	
4/7		" "	
4/8		" "	
4/9		" "	
4/10	57.3*	79.1*	101.3*
4/11	56.3	78.1	99.1
4/12	56.9	76.3	98.6
4/13	56.4	74.5	95.3
4/14	54.8	73.5	94.3
4/15	54.3	72.8	95.7
4/16	53.1	71.7	95.5
4/17	52.6	70.7	93.8
4/18	52.7	69.9	91.1
4/19	53.9	69.6	89.6
4/20	53.6	68.7	88.6
4/21	52.6	68.2	89.4
4/22	52.4	67.7	89.7
4/23	52.7	67.6	89.9
4/24	52.3	67.0	92.1
4/25	51.7	67.1	95.3
4/26	52.1	67.8	95.7
4/27	51.3	67.1	94.7
4/28		BOILER DOWN	
4/29		" "	
4/30	51.6*	66.5*	93.9*

\* Assumes that operation was essentially continuous over the previous 30 days.

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The Department believes that final BACT emission limits should be based on the highest of the above CEMS data plus a margin for compliance. The following shows how these final limits for SO<sub>2</sub> and NO<sub>x</sub> compare on the basis of heat input with the 40 CFR 60 Subpart Db limits for boilers:

<u>Pollutant</u>	<u>Highest 30-DRA</u>	<u>Final Limit 30-DRA</u>		<u>Subpart Db</u>
	<u>lb/hr</u>	<u>lb/hr</u>	<u>lb/MMBTU*</u>	<u>lb/MMBTU</u>
SO <sub>2</sub>	57.9	65.0	0.10	0.5 (oil>0.5%S)
NO <sub>x</sub>	80.8	90.0	0.14	0.3 (gas-wood-MSW)

\* Based on an average factor for MMBTU/MW of 12.8. This is presented for comparison only and is not a limit to be enforced.

On the basis of data recorded through December 31, 1995, the permittee requested and was granted a greater margin for compliance in the case of CO emissions, since higher CO is tied to the uncontrollable moisture content of the wood fired.

All of the final BACT emission limits are presented in the following table. In view of the extremely low emissions of VOCs, HCl, Hg, Pb, and Be relative to the interim limits, and the fact no control measures appear to be warranted for them at this time, the Department accepts the permittee's proposal to maintain the interim limits as the final limits for these pollutants. The Department found insufficient justification for including final limits for other pollutants such as ammonia, arsenic, benzene, cadmium, chromium, PCBs, dioxins/furans, zinc oxide, and sulfuric acid.

<u>Pollutant</u>	<u>Final BACT Limit</u>	<u>Basis for Compliance</u>
SO <sub>2</sub>	65.0 lb/hr	30-Day Rolling Average CEMS*
NO <sub>x</sub>	90.0 lb/hr	30-Day Rolling Average CEMS*
CO	200.0 lb/hr	30-Day Rolling Average CEMS*
PM/PM <sub>10</sub>	0.0080 gr/dscf	EPA Method 5 <sup>^</sup> -only if requested
VOC	22.1 lb/hr	EPA Method 25A <sup>^</sup> -only if requested
HCl	5.0 lb/hr	EPA Method 26 <sup>^</sup> -only if requested
Hg	0.022 lb/hr	EPA Method 101A <sup>^</sup> -only if requested
Pb	0.25 lb/hr	EPA Method 12 <sup>^</sup> -only if requested
Be	0.0063 lb/hr	EPA Method 104 <sup>^</sup> -only if requested
VE	10% Opacity	EPA Method 9-annual basis

\* A new 30-day rolling average emission rate is calculated each steam generating unit operating day as the average of all of the hourly emission data for the preceding 30 steam generating unit operating days.

<sup>^</sup> As performed during test program.