

Revised
Technical Evaluation
and
Preliminary Determination

Ridge Generating Station
Polk County, Florida

PSD-FL-183
AC 53-206244

Department of Environmental Regulation
Division of Air Resources Management
Bureau of Air Regulation

July 15, 1992

I. Application Information

A. Applicant

Ridge Generating Station, L.P.
P.O. Box 2397
Winter Park, FL 32790

B. Request

The Department received a complete application on April 6, 1992, for a permit to construct a 50 megawatt (MW) independent power generation facility known as the Ridge Generating Station (RGS) near Auburndale, Polk County, Florida. On June 22, 1992, the Department notified the applicant of the proposed permit conditions. On July 1, 1992, the applicant

met with Department staff to request reconsideration of the applicant's proposed emission limits. The Department agreed to consider the permit limits originally proposed for SO₂, NO_x and CO as target limits for the initial startup and operation pending the outcome of an emissions testing program. It was also agreed that the applicant's emission calculation for mercury will not be rounded off to make the RGS facility initially subject to PSD requirements for that pollutant. Other revisions include clarification of the municipal waste exclusion, correction of the maximum tire firing rate (9,000 lbs/hr), and modification of compliance test method requirements.

C. Classification/Location

The subject facility (SIC Code 4911) will be located at State Road 542 and Taylor Road near Auburndale, Florida. The UTM coordinates of the site are 416.7 km E and 3100.4 km N.

II. Project Description/Emissions

The applicant proposes to construct a 50 MW power generation facility consisting of a solid-fuel boiler, steam turbine, generator, and associated equipment. The RGS boiler will fire a mixture of waste wood, scrap tires, and landfill gas. Propane will be used for boiler startup, shutdown and combustion stabilization. Fuel mix possibilities include wood, wood and tires, or a combination of wood, tires, and landfill gas from the adjacent Polk County North Central Landfill. No other fuels will be used. The RGS facility will not be permitted to burn any hazardous waste or municipal type solid waste as defined in applicable federal and state regulations, except tires and waste wood.

State-of-the-art emission control equipment will include a spray dryer-absorber/fabric filter for control of particulates and acid gases as well as most toxics and metals. The spray dryer-absorber employs an atomized lime-water solution to react with sulfur dioxide in the boiler flue gases. The dried compounds of calcium thus formed will be removed by the fabric filter. Nitrogen oxides will be controlled by selective noncatalytic reduction (SNCR) which reduces NO_x to elemental nitrogen by injecting ammonia or urea into the boiler furnace.

Since the hours of operation under each of the three scenarios are unknown, and since other fuel mix percentages will also occur, projections of maximum proposed annual emissions would have to be based on the maximums for these anticipated fuel mix cases. The applicant's estimated actual emissions for three anticipated fuel mix scenarios (based on heat input percentages using the applicant's proposed emission limits) are tabulated below.

	<u>100% Wood</u>		<u>80% Wood 20% Tires</u>		<u>75% Wood/15% Tires 10% Landfill Gas</u>		<u>PSD Level</u>
	<u>lbs/hr</u>	<u>tons/yr</u>	<u>lbs/hr</u>	<u>tons/yr</u>	<u>lbs/hr</u>	<u>tons/yr</u>	
PM/PM10	12.6	55.2	12.6	55.2	12.6	55.2	25/10
SO ₂	69.4	304.0	109.4	479.2	92.5	405.2	40
NO _x	94.5	413.9	94.5	413.9	94.5	413.9	40
CO	315.0	1,379.7	315.0	1,379.7	315.0	1,379.7	100
VOC	22.1	96.8	22.1	96.8	22.1	96.8	40

NH3	17.8	78.0	17.8	78.0	17.8	78.0	-
C6H6	5.0	21.9	5.0	21.9	5.0	21.9	-
HCHO	1.7	7.5	1.7	7.5	1.7	7.5	-
HCl	5.0	22.1	5.0	22.1	5.0	22.1	-
Pb	0.25	1.1	0.25	1.1	0.25	1.1	0.6
Zn	0.63	2.8	0.63	2.8	0.63	2.8	-
Hg	0.02	0.097	0.02	0.097	0.02	0.097	0.097
Be	.0063	0.03	.0063	0.03	.0063	0.03	.0004

III. Rule Applicability

The construction permit application is subject to review under Chapter 403, Florida Statutes, and Florida Administrative Code (F.A.C.) Chapters 17-2 and 17-4. The proposed facility is subject to the provisions of F.A.C. Rule 17-2.500, Prevention of Significant Deterioration (PSD). The facility is located in an area classified as attainment for all regulated air pollutants. Proposed emissions of PM/PM10, SO2, NOx, CO, VOC, Pb, and Be equal or exceed the significant levels set forth in Table 500-2 of F.A.C. Rule 17-2.500. Preconstruction review must include a determination of Best Available Control Technology (BACT), good-engineering practice stack height, ambient impact analysis, impact on soils, vegetation and visibility. Applicable emission limit rules are F.A.C. Rules 17-2.660, Table 660-1, Section 60.40b, Subpart Db, 60.43b (c)(1), (f) and (g), 60.44b (d), Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units. For the ash handling system and lime silo, applicable rules are F.A.C. Rules 17-2.610(2) and (3). The above rules would dictate limits except that BACT limits are more stringent and therefore apply.

(d) - PM - 0.1 lb/MMBtu
 - 20% opacity
 6 min avg. - 1.0 min
 20.27%
 (d) hinges on nat. gas.
 Doesn't apply!

IV. Air Quality Analysis

(Need Cleve's writeup)

V. Air Toxics Evaluation

Based on extensive test data for other facilities that burn tires, only negligible quantities of toxic pollutants will escape the emission control equipment and therefore are of no environmental concern.

VI. Conclusion

Based on the information provided by Ridge Generating Station, the Department has reasonable assurance that the proposed installation, as described in this evaluation, and subject to the conditions proposed herein, will not cause or contribute to a violation of any air quality standard, PSD increment, or any other technical provision of Chapter 17-2 of the Florida Administrative Code.

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 500-2 of Florida Administrative Code (F.A.C.) Rule 17-2.500. 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 the following 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 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	<u>Maximum Allowable Emissions (All Fuels)</u>				<u>60% Wood-40% Tires</u>		
	<u>RGS Proposed</u>		<u>Final*</u>		<u>Test Program Actuals</u>		
	<u>lb/hr</u>	<u>tons/yr</u>	<u>lb/hr</u>	<u>tons/yr</u>	<u>lb/hr</u>	<u>lb/hr</u>	<u>tons/yr</u>
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.

~ Based on averages of two quarterly manual stack tests, run by contractor.

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

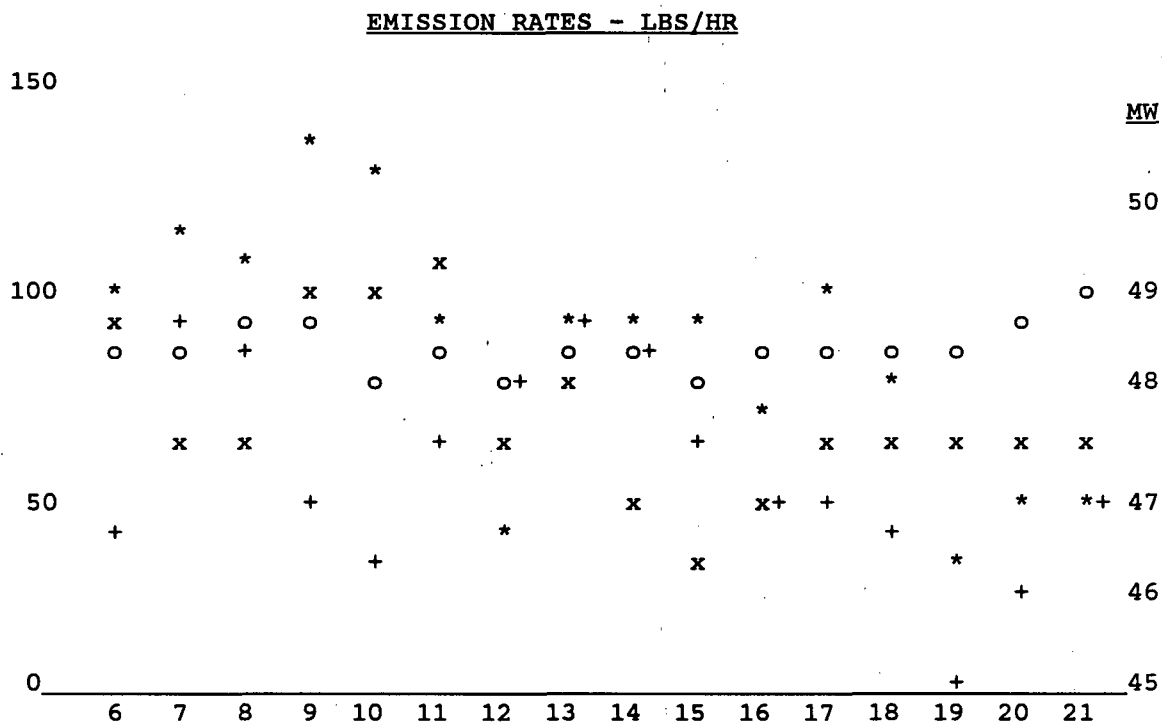
" Multiply by 0.0001.

' Multiply by 0.00001.

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

The SO2 emissions varied greatly compared to the fluctuations in NOx 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 would be expected due to the nature of the feed. However, improvement apparently could be achieved in the response of the SO2 control system. This can be seen below from operating data for the longest

sustained operating period at 90-100% of capacity while firing 60% wood-40% tires:



HOUR # - CEMS DATA FOR 3/1/95
 (*) - SO2 (o) - NOx (x) - CO (+) - MW

BACT Determination Requested by Applicant

Control Technology: Spray Dryer-Absorber/Fabric Filter
 Selective Noncatalytic Reduction (SNCR)
 Combustion Efficiency

Emission Limits: PM/PM10 0.02 lb/MMBTU
 SO2 0.17 lb/MMBTU
 NOx 0.15 lb/MMBTU
 CO 0.50 lb/MMBTU
 VOC 0.035 lb/MMBTU
 Pb 0.0004 lb/MMBTU
 Be 0.00001 lb/MMBTU

BACT Determined by the Department

Control Technology: Spray Dryer-Absorber/Fabric Filter
 Selective Noncatalytic Reduction (SNCR)
 Combustion Efficiency

Emission Limits: lb/MMBTU

	Initial <u>Maximum Limits*</u>	Initial <u>Target Limits**</u>
PM/PM10	0.02	-
SO2	0.17	0.10
NOx	0.15	0.11
CO	0.50	0.21
VOC	0.035	-
Pb	0.0004	-
Be	0.00001	-

* Initial limits to be revised as necessary following emission testing program.

** Target limits believed to be achievable.

BACT Determination Procedure

In accordance with F.A.C. Chapter 17-2, this BACT determination is based on the maximum degree of reduction of each pollutant emitted which the Department, on a case by case basis, taking into account energy, environmental and economic impacts, and other costs, determines is achievable through application of production processes and available control methods, systems and techniques. In addition, the regulations require that in making the BACT determination the Department shall give consideration to:

(a) Any Environmental Protection Agency determination of Best Available Control Technology pursuant to Section 169, and any emission limitation contained in 40 CFR Part 60 (Standards of Performance for New Stationary Sources) or 40 CFR Part 61 (National Emission Standards for Hazardous Air Pollutants).

(b) All scientific, engineering and technical material and other information available to the Department.

(c) The emission limiting standards or BACT determinations of any other State.

(d) The social and economic impact of the application of such technology.

The EPA currently stresses that BACT should be determined using the "top-down" approach. The first step in this approach is to determine for the emission source in question the most stringent control available for a similar or identical source or source category. If it is shown that this level of control is technically or economically infeasible for the source in question, then the next most stringent level of control is determined and similarly evaluated. This process continues until the BACT level under consideration cannot be eliminated by any substantial or unique technical, environmental, or economic objections.

BACT Determination Rationale

Irrespective of control technology economics, the Department believes that the applicant has selected the best control technology available based on a

review of the literature and permit requirements for similar facilities. However, the applicant's final BACT proposal should include a detailed analysis of the economic justification for the control systems selected, since all of the economic data will be available by that time.

A review of EPA's BACT/LAER Clearinghouse indicates that there are no existing sources using the fuel mix proposed for the RGS facility. Since there are significant differences between existing wood/tire burning units and the proposed RGS facility, and since this facility is the first of its kind, the only reasonable approach would involve a two-step procedure for the BACT determination and permit; a preliminary followed by a final determination based on the results of the required emissions testing program. This two-step procedure will require that the applicant propose final enforceable BACT limits and permit conditions and that the Department issue a final BACT determination with permit revisions as indicated by the emissions testing results. Therefore the Department has proposed enforceable initial emission limits and target emission limits for SO₂, NO_x and CO that are to be adjusted as necessary and made enforceable following completion of an emissions testing program. The target limits are based on the more stringent permit limits listed in the BACT/LAER Clearinghouse data.

Contact For Further Information

Preston Lewis, P.E.
Permitting Supervisor
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, FL 32399-2400
Telephone 904-488-1344

Recommended By:

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

Date

Approved By:

Howard Rhodes, P.E., Interim Director
Division of Air Resource Management

Date

PERMITTEE:
Ridge Generating Station, L.P.
P.O. Box 2397
Winter Park, FL 32790

Permit Number: AC 53-206244
PSD-FL-183
Expiration Date: December 31, 1994
County: Polk
Project: Wood/Tire Burning Power
Generation Facility

(Paragraph #1 - Standard)

For the construction of a 50 Megawatt power generation facility to be located at State Road 542 and Taylor Road near Auburndale, Polk County Florida. The UTM coordinates are 416.7 km East and 3,100.4 km North.

(Paragraph #3 - Standard)

Attachments are listed below:

1. DER incompleteness letter dated 1-17-92.
2. RGS letter dated 3-19-92.
3. RGS letter dated 3-27-92.
4. RGS submittal received 4-6-92.

(Specific Conditions)

1. Unless otherwise indicated, the construction and operation of the Ridge Generating Station (RGS) facility shall be in accordance with the capacities and specifications stated in the revised application.
2. The RGS facility shall be allowed to operate at a maximum capacity of 50 Megawatts (approximately equivalent to 630 MMBTU/hr) for 8760 hours per year.
3. Fuel for firing the RGS boiler shall consist only of wood, landfill gas, and up to 9.0 percent tires (percent by weight equivalent to 20 percent tires based on heat content). The 9.0 percent tire weight limitation is equivalent to a tire firing rate of 9,000 pounds of tires per hour. Propane may be used as a startup, shutdown, and combustion stabilization fuel.
4. No municipal type solid waste, as defined in 40CFR60, Subpart Ea (except tires and waste wood), or hazardous waste, as defined in 40CFR261 and F.A.C. Rule 17-730.020, shall be burned at any time at the RGS facility.
5. Initially, the RGS boiler exhaust gases shall not exceed the limits shown below. Following completion of the emission testing program required in Specific Condition No. 8, these limits may be revised.

<u>Pollutant</u>	<u>Basis(lb/MMBTU)</u>	<u>Lbs/hr*</u>	<u>Tons/yr</u>
PM/PM10	0.02	12.6	55.2
SO2	0.17	109.4	479.2
NOx	0.15	94.5	413.9
CO	0.50	315.0	1,379.7
VOC	0.035	22.1	96.8
HCL	0.008	5.0	22.1
Hg	0.000035	0.022	0.097
Pb	0.0004	0.25	1.1
Be	0.00001	0.0063	0.03

*Based on 24 hour average. Emissions over any one hour period shall not exceed these limits by more than fifteen percent. The feasibility of establishing startup/shutdown limits and rolling average limits in addition to or in lieu of the above limits will be determined after analysis of test data.

6. SNCR chemical injection into the boiler exhaust gases shall be provided by an automated control system as described in the application. Ammonia emissions shall be continuously monitored at a prevailing downwind location on the RGS property line by commercially available ambient monitoring equipment. The monitoring data shall be collected and reported for the entire operating period from the initial startup to the time that the emissions testing program is completed. Thereafter, the monitoring data shall be collected and stored and made available to the Department upon request.

7. Visible emissions from the RGS boiler stack, the fly ash silo vent filter, and the lime silo vent filter, shall not exceed 10 percent opacity.

8. In lieu of the usual compliance test requirement, the RGS facility shall, within 60 days after the issue date of this permit, propose for Department approval a comprehensive emissions testing program representative of the full range of facility operation as stated in the application. It will include continuous emission monitoring (CEM) stack data for SO2, NOx and CO, and stack emission tests for each limited pollutant at 50 percent, 75 percent, and 100 percent of permitted capacity for wood and tires. The emissions testing program shall be completed and results submitted as required in Specific Condition No. 16 within fifteen months after the initial startup. The following EPA test methods or other methods approved by the Department shall be followed:

<u>Pollutant</u>	<u>Test Method</u>
PM/PM10	5 (front half only)
SO2	6C
NOx	7E
CO	10
VOC	25A
HCL	26
Hg	101A
Pb	12
Be	104

9. As part of the required emissions testing program, the permittee shall sample the RGS boiler stack for the following pollutants after proposing acceptable test methods to the Department's Bureau of Air Regulation in Tallahassee. The results of these additional tests shall be reported in lbs/hr and ug/m3 along

with the initial compliance test results:

Ammonia
Arsenic
Cadmium
Chromium (total)
Chromium VI
Zinc Oxide
Benzene
Sulfuric Acid
Polychlorinated Biphenyls (PCBs)
Dioxins/Furans

10. Continuous monitoring equipment shall be installed and operated to measure and record generator output, furnace temperature, stack opacity, and SO₂, NO_x and CO emissions. The tire feed rate in pounds per hour shall be monitored continuously by a commercially available weight detecting system with recording capability, or another method approved by the Department. The tire feed rate data shall be maintained and provided to the Department upon request.

11. Fugitive emissions from the RGS material receiving, processing, storage and transfer operations shall be determined according to EPA Method 22 over a 3 day period that is representative of typical operation. Results of the fugitive emissions survey shall be reported along with the results of the emissions testing program.

12. All reasonable precautions set forth in F.A.C. Rule 17-2.610(3), as well as all measures proposed by the permittee in the application, shall be taken by the permittee to prevent fugitive emissions.

13. In the event of any malfunction resulting in failure of emission control equipment or any malfunction of process equipment resulting in emissions exceeding limits set forth in Specific Condition No. 5, the operator shall immediately stop the feeding of tires into the boiler and shall use propane firing, if necessary, to maintain a minimum of 1800 degrees F in the combustion zone until all tires in the system have been combusted. No tires may be refed into the boiler following the malfunction until the emission control equipment has been put into proper working order.

14. Whenever the baghouse bypass is activated during an on-line operating situation for any reason, the permittee shall within 24 hours provide the Department's Southwest District Office with a complete report of the circumstances and reasons for the occurrence and indicating the amounts of pollutants estimated to have been discharged during the bypass period.

15. No pollutants shall be discharged from the RGS facility which cause or contribute to an objectionable odor (F.A.C. Rule 17-2.620(2)).

16. Results of the emissions testing program and other required submittals shall be submitted to the Department's Southwest District Office and the Department's Bureau of Air Regulation Office in Tallahassee within fifteen months after initial startup of the RGS facility. Sampling facilities, methods, and reporting shall be in accordance with F.A.C. Rule 17-2.700 and 40 CFR 60, Appendix A. The Department's Southwest District Office shall be notified at least 30 days in advance of each emission test in the test program. Along with the submittal to

the Department's Bureau of Air Regulation Office, the permittee shall include a revised BACT application.

17. Within 90 days of receipt of the revised BACT application and other required submittals, the Department's Bureau of Air Regulation in Tallahassee shall revise the BACT determination and permit limits and conditions as appropriate with the goal of allowing the RGS facility to be operated in an environmentally responsible manner. Revisions may include additional emission limits for other air pollutants as well as separate limits for specific operating conditions.

18. The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the Department's Bureau of Air Regulation in Tallahassee prior to 60 days before the expiration of the permit (F.A.C. Rule 17-4.090)

19. An application for an operation permit including an operation and maintenance plan must be submitted to the Department's Southwest District office at least 90 days prior to the expiration date of this construction permit or within 45 days after completion of compliance testing, whichever occurs first. To properly apply for an operation permit, the applicant shall submit the appropriate application form, fee, certification that construction was completed noting any deviations from the conditions in the construction permit, and compliance test reports as required by this permit (F.A.C. Rule 17-4.220)

Issued this _____ day
of _____, 1992.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

Carol M. Browner, Secretary

(Cover Letter)

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Mr. Macauley Whiting, Jr., President
Decker Energy - Ridge, Inc.
P.O. Box 2397
Winter Park, FL 32790

Dear Mr. Neiser:

Attached is one copy of the Revised Technical Determination and Preliminary Determination and proposed permit for Ridge Generating Station to construct a wood/tire burning power generation facility near Auburndale, Polk County, Florida.

Please submit any written comments concerning the Department's proposed action to Mr. Preston Lewis of the Bureau of Air Regulation.

Sincerely,

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

CHF/JR/plm
Attachments

c: W. Thomas, SWD
R. Anders, Polk County
J. Harper, EPA
C. Shaver, NPS
T. Fitzpatrick, P.E.
M. Killeen, WESI
J. Little, D&M
R. Stone, RGS

(Intent to Issue)

Ridge Generating Station, L.P.
P.O. Box 2397
Winter Park, FL 32790

DER File No. AC 53-206244
PSD-FL-183

INTENT TO ISSUE

(Standard)

The applicant, Ridge Generating Station, L.P., applied on April 6, 1992, to the Department of Environmental Regulation for a permit to construct a wood/tire burning power generation facility near Auburndale in Polk County, Florida.

(Standard)

Copies furnished to:

W. Thomas, SWD
R. Anders, Polk County
J. Harper, EPA

C. Shaver, NPS
T. Fitzpatrick, P.E.
M. Killeen, WESI
J. Little, D&M
R. Stone, RGS

(Notice of Intent to Issue)

The Department.....permit to Ridge Generating Station, P.O. Box 2397, Winter Park Florida 32790, to construct a wood/tire burning power generation facility at State Road 542 and Taylor Road near Auburndale, Polk County, Florida. A determination of Best Available Control Technology (BACT) is required. The proposed project is subject to Prevention of Significant Deterioration (PSD) regulations. Modeling results show that increases in ground-level concentrations are less than PSD significant impact levels for the applicable pollutants. The Department is issuing this Intent to Issue for the reasons stated in the Revised Technical Evaluation and Preliminary Determination.