

217/782-2113

CONSTRUCTION PERMIT - PSD - NSPS

PERMITTEE

Cordova Energy Company LLC
Attn: James Smith
106 East Second Street
Davenport, Iowa 52801

Application No: 99020097

I.D. No.: 161807AAN

Applicant's Designation: ELECGEN

Date Received: February 26, 1999

Subject: Electric Generation Facility

Date Issued: September 28, 1999

Location: Cordova Energy Center, SW Corner of 192nd Ave. and 250th Street,
Cordova

Permit is hereby granted to the above-designated Permittee to CONSTRUCT emission source(s) and/or air pollution control equipment consisting of 2 gas turbines and associated heat recovery steam generator, and ancillary operations as described in the above referenced application and summarized in Attachment A. This Permit is granted based upon and subject to the findings and special conditions which follow:

In conjunction with this permit, approval is given with respect to the Prevention of Significant Deterioration of Air Quality Regulations (PSD) to construct the above referenced project, in that the Illinois Environmental Protection Agency (Illinois EPA) finds that the application fulfills all applicable requirements of 40 CFR 52.21. This approval is issued pursuant to the Clean Air Act, as amended, 42 U.S.C. 7401 et. seq., the Federal regulations promulgated thereunder at 40 CFR 52.21 for Prevention of Significant Deterioration of Air Quality (PSD), and a Delegation of Authority agreement between the United States Environmental Protection Agency and the Illinois EPA for the administration of the PSD Program. This approval becomes effective in accordance with the provisions of 40 CFR 124.15 and may be appealed in accordance with the provisions of 40 CFR 124.19. This approval is also based upon and subject to the following findings and conditions which follow:

Findings

1. Cordova Energy Company LLC (Cordova Energy) has requested a permit for an electric generation facility that would include 2 "combined cycle" gas turbines equipped with unfired heat recovery steam generators. The facility would have the ability to generate up to about 580 MW of electrical energy.
2. The project would be located on an approximately 40 acre parcel of property in Cordova Township in Rock Island County. The area is currently designated attainment for all criteria pollutants.

3. The proposed project has the potential to emit major amounts of Nitrogen Oxides (NO_x), Carbon Monoxide (CO), Particulate Matter (PM), and Volatile Organic Material (VOM) as shown in Table 2. The project is therefore subject to PSD review for NO_x, CO, PM, and VOM.
4. After reviewing the materials submitted by Cordova Energy, the Illinois EPA has determined that the project will (i) comply with applicable Board emission standards (ii) comply with applicable federal emission standards and (iii) utilize Best Available Control Technology (BACT) on emissions of NO_x, CO, PM, and VOM.
5. The gas turbines are affected units under the Acid Rain Deposition Control Program pursuant to Title IV of the Clean Air Act and are subject to certain control requirements and emissions monitoring requirements pursuant to 40 CFR Parts 72, 73 and 75. As affected units under the Acid Rain Program, Cordova Energy must also obtain an Acid Rain Permit before commencing operation.
6. The air quality analysis submitted by Cordova Energy and reviewed by the Illinois EPA shows that the proposed project will not cause violations of the ambient air quality standard for NO_x, CO, and PM/PM₁₀. The air quality analysis shows compliance with the allowable increment levels established under the PSD regulations.
7. The Illinois EPA has determined that the proposed project complies with all applicable Illinois Air Pollution Board Regulations and the federal Prevention of Significant Deterioration of Air Quality Regulations (PSD), 40 CFR 52.21.
8. A copy of the application, the project summary and a draft of this permit were placed in a location in the vicinity of the project, and the public was given notice and an opportunity to examine this material and to submit comments and to request a public hearing on this matter.

The Illinois EPA is issuing approval to construct the proposed project subject to the following special conditions and consistent with the specifications and data included in the application. Any departure from the conditions of this approval or terms expressed in the application would need to receive prior written authorization by Illinois EPA.

Conditions

1. Standard conditions for issuance of construction permits, attached hereto and incorporated herein by reference, shall apply to this project, unless superseded by the following special conditions.

2. Each combustion turbine (CT) is subject to the following requirements:
 - a. Each CT shall be equipped, operated, and maintained with dry low NO_x combustors and a selective catalytic reduction (SCR) system in the heat recovery steam generator (HRSG) to reduce emissions of NO_x.
 - b. The emissions of NO_x from each CT/HRSG when firing natural gas shall not exceed 4.5 ppmv at 15% O₂ on an hourly average, except during startup, malfunction or shutdown as addressed by Condition 3.
 - c. The CT shall be maintained and operated with good combustion practice to reduce emissions of CO, PM, and VOM.
- 3a. Each CT/HRSG shall be operated in a manner consistent with good air pollution control practice to minimize emissions of NO_x during startup, malfunction, and shutdown including:
 - i. Operation in accordance with the manufacturer's written instructions or other written instructions developed by the Permittee.
 - ii. Review of operating parameters of the unit during startup, malfunction, and breakdown, or shutdown as necessary to make adjustments to reduce or eliminate excess emissions.
 - iii. Operation of the SCR system as soon as and as long as the unit operating conditions are amenable to its effective use.
- b.
 - i. Upon malfunction of the SCR system that will result in NO_x emissions in excess of Conditions 2(b), The Permittee shall as soon as practicable repair the affected system or remove the CT from service so that excess emissions cease.
 - ii. Consistent with the above, if the Permittee has maintained and operated a CT/HRSG/SCR so that malfunctions are sudden, infrequent, not caused by poor maintenance or careless operation and in general are not reasonably preventable, the Permittee shall begin shutdown of the CT within 90 minutes, unless the malfunction is expected to be repaired in 120 minutes or such shutdown could threaten the stability of the regional electrical power system. In such case, shutdown of the CT shall be undertaken when it is apparent that repair will not be accomplished within 120 minutes or shutdown would not endanger the regional power system. In no case shall shutdown of a CT be delayed solely for the economic benefit of the Permittee.

- iii. Notwithstanding the above, if the Permittee determines that the NO_x continuous emission monitoring system (CEMS) inaccurately recorded excess NO_x emissions, the Permittee may continue operation provided the Permittee records the information it is relying upon to conclude that the CT/HRSG/SCR is functioning properly and the CEMS is reporting inaccurate data and takes prompt action to resolve the accuracy of the CEMS.
- 4a. The auxiliary boiler shall be equipped with low-NO_x burners designed to emit no more than 0.05 lb NO_x/million Btu heat input on an hourly average.
 - b. The auxiliary boiler shall be maintained and operated with good combustion practice to reduce emissions of CO, PM, and VOM.
- 5a. The fuel heater shall be equipped with low-NO_x burners designed to emit no more than 0.044 lb NO_x/million Btu heat input on an hourly average.
 - b. The fuel heater shall be maintained and operated with good combustion practice to reduce emissions of CO, PM, and VOM.
- 6a. The cooling towers shall each be equipped, operated, and maintained with drift eliminators designed to limit the loss of water droplets from the cooling tower to not more than 0.002% of the circulating water flow.
 - b. Good operating practices shall be followed for the cooling tower to maintain the level of dissolved solids in the cooling tower blowdown to not more than 3,000 ppm, composite daily sample.

Conditions 2, 3, 4, 5 and 6 represent the application of the Best Available Control Technology as required by Section 165 of the Clean Air Act.

- 7a. The CT's are subject to the New Source Performance Standard (NSPS) for Stationary Gas Turbines, 40 CFR 60, Subpart A and GG. The Illinois EPA is administrating NSPS in Illinois on behalf of the United States EPA under a delegation agreement.
 - i. The NO_x emissions from each CT shall not exceed the limit established by the NSPS, pursuant to 40 CFR 60.332 (a)(1).
 - ii. The emission from each CT shall not contain SO₂ in excess of 0.015 percent by volume at 15% O₂ and on a dry basis or the CT shall not burn any fuel which contains sulfur in excess of 0.8 percent by weight, pursuant to 40 CFR 60.333 (a) and (b).
- b. The auxiliary boiler is subject to the New Source Performance Standard (NSPS) for small steam generating units, 40 CFR 60, Subpart A and Dc. The Illinois EPA is administrating NSPS in Illinois on behalf of the United States EPA under a delegation agreement.

- c. At all times, the Permittee shall maintain and operate the CT's and auxiliary boiler in a manner consistent with good air pollution control practice for minimizing emissions, pursuant to the NSPS, 40 CFR 60.11(d).
- 8a. The emission of smoke or other particulate matter from a CT or fuel heater shall not have an opacity greater than 30 percent, pursuant to 35 IAC 212.123(a), except as allowed by 35 IAC 201.149, 212.123(b) or 212.124.
- b. The emission of smoke or other particulate matter from the auxiliary boiler shall not have an opacity greater than 20 percent, pursuant to 35 IAC 212.122(a).
- 9. The only fuels fired in the CT's, auxiliary boiler, and fuel heater shall be natural gas, as defined in 40 CFR 60.41c.
- 10a. Emissions from each CT/HRSG's shall not exceed the limits in Table 1.
- b. Emissions of NO_x from the auxiliary boiler, in total, shall not exceed 2.3 lb/hr and 10 tons/yr.
- c. Emissions of PM from the cooling towers, in total, shall not exceed 18 tons/yr.
- 11a. Under this permit, each CT/HRSG may be operated for a period of up to 180 days from initial startup to allow for equipment shakedown and emissions testing as required. This period may be extended by the Illinois EPA upon request of the Permittee if additional time is needed to complete startup or perform emission testing.
- b. Upon successful completion of emission testing demonstrating compliance with applicable limitations, the Permittee may continue to operate the facility as allowed by Section 39.5 (5) of the Environmental Protection Act.
- c. This Condition supersedes Standard Condition 6.
- 12a. Within 60 days after operating a CT/HRSG at the greatest load at which it will normally be operated but not later than 180 days after its initial startup, the Permittee shall perform emissions tests of the CT/HRSG as follows. These tests shall be used as the initial compliance tests to demonstrate compliance with the limits and conditions set in this permit.
- b. Emissions shall be measured by an approved testing service at maximum load for NO_x, CO, PM, and opacity. During the initial performance tests, emissions shall also be measured at the minimum load, and four intermediate load levels for NO_x.

- c. The following USEPA methods and procedures shall be used for testing of emissions, unless another USEPA method is approved or specified by the Illinois EPA. For each turbine, measurement of NO_x and SO₂ emissions shall be conducted and data collected in accordance with the test methods and procedures specified in 40 CFR 60.335.

Location of Sample Points	USEPA Method 1
Gas Flow and Velocity	USEPA Method 2
Flue Gas Weight	USEPA Method 3 or 3A
Moisture	USEPA Method 4
Particulate Matter	USEPA Method 5
Nitrogen Oxides	USEPA Method 20
Opacity	USEPA Method 9
Carbon Monoxide	USEPA Method 10
PM ₁₀	USEPA Method 5* or Method 201 or 201A (40 CFR 51, Appendix M)

- * The Permittee may report all PM emissions measured by USEPA Method 5 as PM₁₀, including back half condensable particulate. If the Permittee reports USEPA Method 5 PM emissions as PM₁₀, testing using USEPA method 201 or 201A need not be performed.

- d. At least 60 days prior to the actual date of testing, a written test plan shall be submitted to the Illinois EPA for review. This plan shall describe the specific procedures for testing and shall include as a minimum:
- i. The person(s) who will be performing sampling and analysis and their experience with similar tests.
 - ii. The specific conditions under which testing shall be performed including a discussion of why these conditions will be representative of maximum emissions and the means by which the operating parameters for the CT/HRSG will be tracked and recorded.
 - iii. The specific determinations of emissions that are intended to be made, including sampling and monitoring locations. As part of this plan, the Permittee may set forth a strategy for performing emission testing of selected turbines provided that all turbines are fitted for testing; the identity of the CT/HRSG to be tested is determined immediately before testing, by the Illinois EPA or otherwise randomly; and continuous emission monitoring of NO_x is present on all turbines.
 - iv. The test method(s) which will be used, with the specific analysis method, if the method can be used with different analysis methods.

- e. The Illinois EPA shall be notified prior to these tests to enable it to observe these tests. Notification for the expected date of testing shall be submitted a minimum of 30 days prior to the expected date. Notification of the actual date and expected time of testing shall be submitted a minimum of 5 working days prior to the actual date of the test. The Illinois EPA may at its discretion accept notifications with shorter advance notice provided that the Illinois EPA will not accept such notifications if it interferes with the Illinois EPA's ability to observe testing.
- f. Three copies of the Final Reports for these tests shall be forwarded to the Illinois EPA, Compliance Section in Springfield within 30 days after the test results are compiled and finalized, in advance of the operating permit application if necessary. The Final Report from testing shall contain a minimum:
 - i. A summary of results;
 - ii. General information;
 - iii. Description of test method(s), including a description of sampling points, sampling train, analysis equipment, and test schedule;
 - iv. Detailed description of test conditions, including:
 - A. Fuel consumption (standard ft³);
 - B. Firing rate (million Btu/hr); and
 - C. Turbine/Generator output rate (MW).
 - v. Data and calculations, including copies of all raw data sheets and records of laboratory analysis, sample calculations, and data on equipment calibration.
- g. Submittals and notification with respect to emissions testing shall be made to the following:

Illinois Environmental Protection Agency
Division of Air Pollution Control - Regional Office
5415 North University
Peoria, Illinois 61614

Illinois Environmental Protection Agency
Emission Monitoring and Testing Unit
P. O. Box 19276
Springfield, Illinois 62794-9276

Illinois Environmental Protection Agency
Division of Air Pollution Control, Compliance Section (#40)
P. O. Box 19276
Springfield, Illinois 62794-9276
Telephone 217/782-5811 Facsimile 217/782-6348

- 13a. The Permittee shall install, operate, and maintain a Continuous Emissions Monitoring (CEM) system to measure emissions of NO_x from each CT to demonstrate compliance with the limitations of this permit.
- b. i. The procedures under 40 CFR 60.13 and 75.12 and 40 CFR 75 Appendix F shall be followed for the installation, evaluation, and operation and determination of NO_x emission rate for the CEM systems.
- ii. The Permittee shall submit to the Illinois EPA for review and comments detailed monitoring plans as follows:
- At least 30 days prior to initial startup of a CT; a plan shall be submitted describing the configuration and operation of the NO_x CEM system(s). The plan shall also state whether the Permittee is installing a SO₂ CEM system (40 CFR 75.11) rather than sulfur analysis and flow monitoring equipment in accordance with 40 CFR 75.11(e).
- c. These CEMS shall be operational and collecting data in accordance with the provisions of the Acid Rain Program.
14. The Permittee shall sample and analyze for sulfur and nitrogen content of the fuels being fired in each CT in accordance with 40 CFR 60.334(b) unless the Permittee has a custom schedule approved by the Illinois EPA, for the determination of these values based on the design and operation of the source and the characteristics of the fuel supply.
15. The Permittee shall install, operate, and maintain monitors on each CT and the auxiliary boiler to measure and record fuel consumption
- 16a. The Permittee shall maintain a file of the following items:
- i. The heat content of the fuel fired in the CT's and auxiliary boiler (Btu/standard ft³); and
- ii. The sulfur and nitrogen content of the fuel fired in the CT's, as determined in accordance with Condition 14.
- b. The Permittee shall maintain the following daily records:
- i. The quantity of fuel consumed for each CT and the auxiliary boiler (standard ft³);

- ii. Identification of each hour when a turbine is operated at less than 60% load, other than during startup, malfunction, or shutdown as addressed below in Condition 16(d).
- c. The Permittee shall keep inspection, maintenance, and repair logs with dates and nature of such activities for the following:
- i. Each CT/HRSG;
 - ii. Each SCR system;
 - iii. The SCR reagent storage system;
 - iv. Auxiliary boiler and fuel heater; and
 - v. Cooling tower drift eliminators.
- d. The Permittee shall maintain following records related to startup, malfunction and breakdown, and shutdown of each CT/HRSG:
- i. The time and date of startup, malfunction or breakdown and shutdown of a CT/HRSG, and confirmation that standard practices were followed;
 - ii. Each incident when operation of a CT/HRSG continued during malfunction or breakdown with excess emissions, including the following information:
 - A. Date and duration of malfunction or breakdown;
 - B. A description of the malfunction or breakdown;
 - C. The reason continued operation was necessary, including supporting documentation; and
 - D. The corrective actions used to reduce the quantity of emissions and the duration of the incident.
- e. The Permittee shall keep the following records with regards to emissions:
- i. NO_x emissions from each CT/HRSG recorded hourly (in lb/mmBtu and lb/hr) by combining the NO_x concentration (in ppm) and diluent concentration (in percent O₂ or CO₂) as monitored in accordance with Condition 13;
 - ii. NO_x emissions (in lb/mmBtu) quarterly and annual, based on the above data;

- iii. Monthly emissions of NO_x, CO, SO₂, VOM, and PM from each CT/HRSG (ton/month). NO_x emissions shall be based on the above data. All other emissions shall be calculated based on fuel consumption data and site-specific emission factors developed from emission test data (CO and PM) and appropriate emission factors (SO₂ and VOM);
 - iv. Monthly emissions of NO_x, CO, SO₂, VOM, and PM from the auxiliary boiler (ton/month) calculated from operating data and appropriate emission factors; and
 - v. Annual facility emissions of NO_x, CO, SO₂, VOM, and PM, based on monthly emission data.
17. All records required by this permit shall be retained on site for a period of at least 3 years and shall be readily available for inspection and copying by the Illinois EPA upon request.
- 18a. i. For each CT and the auxiliary boiler, the Permittee shall fulfill applicable notification requirements of the NSPS, 40 CFR 60.7(a), including notifications for date of commencement of construction and actual date of initial startup.
- ii. With the notifications for commencement of construction, the Permittee shall provide the manufacturers and model of the turbine, HRSG, SCR, and boiler that has been selected and provide a copy of the manufacturer's guarantee for emissions. For the boiler, the Permittee shall identify the design heat input capacity and the estimated annual capacity factor at which it will be operated.
- b. In the event of continued operation of a CT/HRSG with excess NO_x emissions during a malfunction of the SCR system, is expected to occur for more than 90 minutes, as addressed by Condition 3(b) the Permittee shall promptly notify the Illinois EPA's regional office of the malfunction and the reason for continued operation.
- 19a. If there is an exceedance of the requirements of Condition 2 through 10 of this permit, the Permittee shall submit a report to the Illinois EPA's Compliance Section in Springfield, Illinois within 30 days after the exceedance. The report shall include a description of the exceedance, a copy of relevant records, and a description of the exceedance or violation and efforts to reduce emissions and future occurrences.
- b. The Permittee shall comply with applicable reporting requirements under the Acid Rain Program, with a single copy of such report sent to Illinois EPA, Division of Air Pollution Control, Compliance Section.

- 20a. Any required reports and notifications concerning equipment operation, emissions testing, or a monitoring system shall be sent to the Illinois EPA at the following address unless otherwise indicated:

Illinois Environmental Protection Agency (40-CASM)
Division of Air Pollution Control, Compliance Section
P.O. Box 19276
Springfield, Illinois 62794-9276
Telephone: 217/782-5811 Fax: 217/782-6348

- b. A copy of all reports and notifications, as required above, except the Annual Emission Report required by 35 Ill. Adm. Code 254, shall also be sent to the Illinois EPA at the following address:

Illinois Environmental Protection Agency
Division of Air Pollution Control - Regional Office
5415 North University
Peoria, Illinois 61614

- 21a. Pursuant to 40 CFR 52.21(r)(2), this permit shall become invalid if construction is not commenced within 18 months after this permit becomes effective, if construction is discontinued for a period of 18 months or more, or if construction is not completed within a reasonable period of time. The 18 month period may be extended by the Illinois EPA upon a satisfactory showing that an extension is justified. This condition supersedes Standard Condition 1.

- b. For purposes of the above provisions, the definitions of "construction" and "commence" at 40 CFR 52.21 (b)(8) and (9) shall apply, which require that a source must enter into a binding agreement for on-site construction or begin actual on-site construction. (Also see the definition of "begin actual construction," 40 CFR 52.21 (b)(11))

22. This Permit for the above referenced project does not relieve the Permittee of the responsibility to comply with all Local, State and Federal Regulations which are part of the applicable Illinois State Implementation Plan, as well as all other applicable Federal, State, and Local requirements.

If you have any questions concerning this permit, please contact Troy Poorman at 217/782-2113.

Donald E. Sutton, P.E.
Manager, Permit Section
Division of Air Pollution Control

DES:TDP:jar

cc: Region 2

Attachment A: Emission Units

<u>Unit I.D.</u>	<u>Description</u>	<u>Number</u>	<u>Rated Heat Input¹ (mmBtu/Hr)</u>	<u>Rated Electrical Output^{1, 2} (MWe)</u>	<u>Control</u>
CCCT 1 - 2	Combustion Turbine (CT)	2	1,824.1	75-290	Selective Catalytic Reduction and Low NO _x Combustors
	Auxiliary Boiler	1	47	---	Low NO _x Burner
	Fuel Heater	1	5	---	Low NO _x Burner
	Backup Diesel Generator ³	1	10.3	---	None
	Backup Diesel Fire Pump ³	1	2.5	---	None
	Cooling Tower	8 Cells	---	---	Drift Eliminators

1. Nominal ratings per unit.
2. Includes output from steam electric generator turbine.
3. Unit operated on a limited basis for backup purposes. For example, diesel electric generators are needed to maintain lubrication and other auxiliary systems in the event of a power failure during shutdown. As a result, the units are not considered significant units.

Table 1

Emission Limits for Turbines

<u>Pollutant</u>	<u>(Lb/mmBtu¹)</u>	<u>(Lb/Hr²)</u>	<u>(Ton/Yr³)</u>
NO _x	0.019	35.0	153.3
CO	0.547	105.0	503.7
PM/PM ₁₀	0.029	56.6	222.5
VOM	0.032	10.0	43.8
SO ₂	0.001	2.0	8.8

Emission limits are per unit

1. Hourly average limit based on vendor/manufacture data and information provided in the permit application

2. Limits based on modeling data and information provided in the permit application. These limits apply at all times, except the limits on CO and VOM, which do not apply as follows. Below 75% turbine load, CO and VOM emissions shall not exceed 600 and 35 lb/hour, respectively, in lieu of the limits set forth above. In addition, during the first two years of operation of a turbine CO emissions at 75% turbine load or above shall not exceed 127 lb/hr in lieu of the limit set forth above. If the applicable limits for CO, VOM, or PM/PM₁₀ are not met by a turbine, it shall also be presumed to constitute failure to use good combustion practice as required by Condition 2(c), as well as an exceedance of Condition 10(a).

3. Based on information provided in the permit application that considers average hourly emissions from the turbine during the course of a year. In particular, the turbines have lower capacity during warmer weather (higher air temperature) with accompanying lower NO_x, CO, and PM/PM₁₀ annual emission rates.

Table 2: Potential Facility Emissions (Ton/Yr)

Unit	NO _x	CO	PM	VOM	SO ₂
CT/HRSG	306.6	1,007.4	445.0	87.6	17.5
Auxiliary Boiler	9.8	16.4	1.5	1.1	0.1
Cooling Towers	-----	-----	<u>18.0</u>	----	----
Totals:	316.4	1,023.8	464.5	88.7	17.6

TDP:jar