

217/782-2113

CONSTRUCTION PERMIT - NSPS

PERMITTEE

MEP Flora Power, LLC
Attn: Mr. Frank B. Costanza
1100 Walnut
Kansas City, Missouri 64106

Application No: 00050050

I.D. No.: 025803AAD

Applicants Designation: CT

Date Received: May 8, 2000

Subject: Six Natural Gas-Fired Turbines (Power Generation)

Date Issued:

Location: Township Road, approximately 3 1/2 Miles Northwest of Flora, Clay County

Permit is hereby granted to the above-designated Permittee to CONSTRUCT emission source(s) and/or air pollution control equipment consisting of a 508.5 MW_e natural gas fired power plant with up to six gas turbines, with a nominal capacity of 84.75 MW_e per turbine, and other ancillary operations, as described in the above referenced application and summarized in Attachment A.

This Permit is subject to standard conditions attached hereto and the following special condition(s):

- 1a. The turbines 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.
- b. The Permittee shall not emit into the atmosphere from any turbine any gases which contain nitrogen oxides (NO_x) in excess of the following equation, pursuant to 40 CFR 60.332 (a)(1), except as allowed by 40 CFR 60.332(f):

$$\text{STD} = 0.0075 \left(\frac{14.4}{Y} \right) + F$$

Where:

STD = Allowable NO_x emission (percent by volume at 15 percent oxygen and on a dry basis).

Y = Manufacturer's rated heat rate at manufacture's rated load (kilojoules per watt hour) or, actual measured heat rate based on lower heating value of fuel as measured and actual peak load for the facility. The value of Y shall not exceed 14.4 kilojoules per watt-hour.

F = NO_x emission allowance for fuel-bound nitrogen as defined in
40 CFR 60.332 (a)(3).

- c. The Permittee shall not emit into the atmosphere from any turbine any gases which contain sulfur dioxide in excess of 0.015 percent by volume at 15 percent oxygen and on a dry basis, or 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).
 - d. At all times, the Permittee shall maintain and operate the turbines in a manner consistent with good air pollution control practice for minimizing emissions, pursuant to the NSPS, 40 CFR 60.11(d).
2. The emission of smoke or other particulate matter from each turbine shall not have an opacity greater than 30 percent, pursuant to 35 IAC 212.123(a), except as allowed below (35 IAC 201.149, 212.123(b) or 212.124).
 3. The 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, the Permittee must also obtain an Acid Rain Permit for operation of the turbines in accordance with 40 CFR 70.30(a)(2)(ii) and 72.32(a).
- 4a.
 - i. The only fuel fired in the turbines shall be natural gas.
 - ii. The total natural gas consumption of the turbines shall not exceed 8,475 million ft³ per year. Compliance with this limit shall be determined from a running total of 12 months of data.
 - b. The turbines shall be equipped, operated, and maintained with Low NO_x combustors.
 - c.
 - i. Hourly emissions from each turbine shall not exceed the following limits, except during startup and shutdown (see Condition 5(b)). These emission limits are based on the data provided in the application for maximum emissions. These limits reflect achievement of emission rates of 15 ppmd and 25 ppm at 15% O₂ for NO_x and CO, respectively (0.062 lb NO_x/million Btu HHV):

<u>NO_x</u> (Lb/Hr)	<u>CO</u> (Lb/Hr)	<u>PM/PM₁₀</u> (Lb/Hr)	<u>VOM</u> (Lb/Hr)	<u>SO₂</u> (Lb/Hr)
60.0	59.0	10.0	10.0	2.6

These limits are based on information provided in the permit application.

- ii. Notwithstanding the above, when the operating load of a turbine is 101 percent or more of the manufacturer's nominal rated output

(rated output) or 50 percent or less than the rated output, NO_x emissions from the turbines shall not exceed 107 lbs/hour.

- d. i. The total annual emissions of the six turbines shall not exceed the following limitations. Compliance with these annual limitations shall be determined from a running total of 12 months of emission data.

<u>Pollutant</u>	<u>Emissions (Tons/Year)</u>
NO _x	245.0
CO	245.0
PM/PM ₁₀	49.0
VOM	49.0
SO ₂	10.0

- ii. For purposes of determining compliance with the above limitations:

- A. Unless emission monitoring is performed for a pollutant, emissions during periods other than startup shall be determined from emission factors developed from testing in accordance with Condition 11 (NO_x, CO, VOM and PM/PM₁₀) or standard factors (SO₂).
- B. Unless an alternative factor is established for the pollutant or emission monitoring is performed for the pollutant, emissions of NO_x, CO and VOM during an hour that includes a startup shall be assumed to be at the applicable hourly limit in Condition 4(c)(i) multiplied by a startup factor (S): S_{NOx} = 1, S_{CO} = 2 and S_{VOM} = 2. For example, the CO emissions during an hour that includes a startup shall be assumed to be 118 pounds per hour (2 x 59 = 118). These assumptions are based on data in the application describing emissions during startup of a turbine. Any alternative factor for emissions during startup of a turbine shall be based on representative emission testing conducted with USEPA Reference Test Methods. (Refer to Condition 11.)

- e. Annual emissions of hazardous air pollutants shall be less than 10 tons of any hazardous pollutant and less than 25 tons in aggregate for any combination of hazardous air pollutants, as indirectly addressed by limits on emissions of criteria pollutants.

The above limitations are established pursuant to 40 CFR 52.21, the federal rules for Prevention of Significant Deterioration of Air Quality (PSD). These limits ensure that the construction and operation of the power plant does not constitute a new major source pursuant to PSD.

These limits also ensure that this project is not subject to review under Section 112(g) of the Clean Air Act.

5. Each turbine shall be operated in a manner consistent with good air pollution control practice to minimize emissions associated with during startup and shutdown including the following. The Permittee shall formally review these practices at least annually and enhance them consistent with good air pollution control practice based on actual operating experience and performance of the turbines.
 - a. The Permittee shall manage the operation of the turbines to provide adequate time for normal startup of the turbines, except for emergencies, and to minimize multiple startups of a turbine in a single day, unless startup is tripped off.
 - b. The Permittee shall operate in accordance with the manufacturer's written instructions or other written instructions developed and maintained by the Permittee, which shall include at a minimum the following measures:
 - Review of operating parameters of the unit during startup, or shutdown as necessary to make adjustments to reduce emissions;
 - Implementation of inspection and repair procedures for a turbine prior to attempting startup following repeated trips.
 - c. Maintenance of the turbines in accordance with written procedures developed and maintained by the Permittee.
- 6a. Under this permit, the turbines 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 at its discretion upon request of the Permittee, for example if additional time is needed to complete shakedown or perform emission testing due to unanticipated delays in these activities.
 - b. Upon successful completion of emission testing demonstrating compliance with applicable limitations, the Permittee may continue to operate the turbines as allowed by Section 39.5 (5) of the Environmental Protection Act.
 - c. This condition supersedes Standard Condition 6.
7. The Permittee shall furnish the Illinois EPA with written notification as follows:

- a. i. The date construction of the turbines commenced, as defined in 40 CRR 60.2, postmarked no later than 30 days after such date, pursuant to 40 CFR 60.7(a)(1). (This notification may be provided when construction activity is commenced for the proposed source.)
 - ii. If the Permittee initially commences construction for less than six turbines, this shall be stated in the initial notification and separate notification shall be provided if construction of additional turbines is commenced pursuant to this permit. (See also Condition 16.)
 - b. The actual date of initial startup of the turbines, i.e., initial firing of fuel by turbine, postmarked within 15 days after such date, pursuant to 40 CFR 60.7(a)(3).
8. Each turbine shall be equipped, operated, and maintained with a continuous monitoring system to monitor and record the fuel consumption.
- 9a. The Permittee shall determine sulfur content of the natural gas fired in the turbines in accordance with the applicable provisions in 40 CFR 75, Appendix D, Section 2.3.2 for pipeline natural gas combustion.
- b. Monitoring of fuel nitrogen content is not required, as natural gas is the only fuel fired in the turbines.
 - c. The above provisions establish a custom schedule for determination of sulfur and nitrogen content in accordance with 40 CFR 60.334 (b) and USEPA's Custom Fuel Monitoring Document dated August 14, 1987. These provisions shall only supersede the requirement of 40 CFR 60.334 if this custom schedule is approved by USEPA.
- 10a. This permit is issued based on the turbines being gas-fired peaking units, as specified in 40 CFR Part 75, so that continuous emission monitoring is not required for NO_x. To maintain this status, the three year rolling average annual capacity factor of a turbine shall not be greater than 10 percent, and the highest annual capacity factor shall not be greater than 20 percent in any one of the three averaging years. (Annual capacity factors of 10 and 20 percent are equivalent to operating for 876 and 1,752 hours per year, respectively at full load.).
- b. Should the operation of a turbine exceed the above requirements relating to the definition of a gas-fired peaking unit in 40 CFR 75, the Permittee shall install the appropriate Continuous Monitoring System(s) on the turbine by December 31 of the following calendar year, as defined in 40 CFR 75, in order to remain in compliance with the provisions of the Acid Rain Program.

- c. The turbines, as installed, shall be equipped with facilities, i.e., sampling ports, appropriate platforms and access and associated utilities, to allow continuous emissions monitoring systems to be readily installed and operated in accordance with 40 CFR Part 75.
- 11a. The nitrogen oxides (NO_x), carbon monoxide (CO), volatile organic material (VOM), particulate matter (PM), and oxygen (O₂) concentrations in the exhaust of the turbines and the opacity of exhaust shall be measured at the Permittee's expense by an independent testing service approved by the Illinois EPA as follows to determine compliance with the emission limits in Condition 2, 4, 5, and 6:
 - i. Within 60 days after operating a turbine at the greatest load at which it will normally be operated but not later than 180 days after its initial startup;
 - ii. Within 120 days after a written request from the Illinois EPA, for such pollutants listed above as specified by the request; and
 - iii. Any extension to these time periods that may be provided at its discretion by the Illinois EPA shall not alter the Permittee's obligation to perform emission testing for purposes of the NSPS in a timely manner as specified by 40 CFR 60.8.
- b. The following methods and procedures shall be used for testing of emissions:

- i. The following USEPA test methods shall be used:

Location of Sample Points	USEPA Method 1
Gas Flow and Velocity	USEPA Method 2
Stack Gas Analysis	USEPA Method 3 or 3A
Stack Gas Moisture Content	USEPA Method 4
Opacity	USEPA Method 9
Carbon Monoxide	USEPA Method 10
Volatile Organic Material	USEPA Method 18 or 25
Nitrogen Oxides	USEPA Method 20
Particulate Matter	USEPA Method 5
Particulate Matter ₁₀	USEPA Method 201 or 201A (40 CFR 51, Appendix M)

- ii. Measurements for NO_x shall be conducted in accordance with 40 CFR 60.335, as specified below:

- A. The NO_x emissions shall be computed for each run using the equation in 40 CFR 60.335(c)(1).
- B. The span values for Method 20 shall be 300 ppm of NO_x and 21 percent O₂, pursuant to 40 CFR 60.335(c)(3).
- C. The NO_x emissions shall be determined at four points in the normal operating range of the turbines, including the minimum point in the range and peak load, pursuant to 40 CFR 60.331(i) and 60.335(c)(2).
- D. All loads shall be corrected to ISO conditions using the appropriate equations supplied by the manufacturer, pursuant to 40 CFR 60.335(c)(2).

- iii. Measurements for other pollutants shall be conducted as follows:

- A. CO, PM and VOM concentrations shall be measured at peak intermediate and minimum turbine load.
- B. PM emissions measured by USEPA Method 5, including back half condensable particulate, may be provided as an alternative to measurement of PM₁₀ emissions using USEPA Method 201 or 201A.
- C. Measurements for organic hazardous air pollutants in the VOM (e.g., formaldehyde, toluene, acetaldehyde, and acrolein) shall be provided if VOM emissions are measured by Method 18. (See also Condition 11(c)(iii).)

- c. 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 turbine will be tracked and recorded.
 - iii. The specific determinations of emissions that are intended to be made, including sampling and monitoring locations and identification of organic hazardous air pollutants that will be measured. 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 turbines 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. The Permittee may also propose a plan for testing across the normal operating range of the turbines.
 - iv. The test method(s) that will be used, with the specific analysis method, if the method can be used with different analysis methods.
- d. The Illinois EPA shall be notified prior to these tests to enable the Illinois EPA to observe these tests. Notification of the expected date of testing shall be submitted a minimum of thirty (30) days prior to the expected date. Notification of the actual date and expected time of testing shall be submitted a minimum of five (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 the testing.
- e. The Final Report for these tests shall be submitted to the Illinois EPA within 60 days after the date of the tests. The Final Report shall include as a minimum:
- i. A summary of results.
 - ii. General information.
 - iii. Description of test method(s), including 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 analyses, sample calculations, and data on equipment calibration.

- 12a. The Permittee shall maintain records of the following items:
- i. Heat content of the natural gas (Btu/ft³) being fired during the quarter, with supporting documentation on at least a quarterly basis;
 - ii. The sulfur content of the fuel used to fire the turbines as determined in accordance with Condition 9(a). (If the standard emissions factor is used, i.e., 0.0023 lb/mmBtu, records shall be kept for any measurements or data on actual sulfur content.); and
 - iii. Fuel consumption for each turbine as monitored in accordance with Condition 8.
- b. The Permittee shall maintain operating logs for each turbine which at a minimum shall include daily information for operating hours and fuel consumption, periods of time when inlet air cooling is used, and any period of time when a turbine operates at 101 percent or more of rated output.
- c. The Permittee shall maintain the following records related to startup of the turbines:
- i. The following information for each startup of the turbines:
 - A. Date and time of startup;
 - B. Type of startup, i.e.; scheduled or emergency;
 - C. Whether operating personnel for the turbines or air environmental staff are on site during startup; and
 - D. A description of the startup, if written operating procedures are not followed during the startup or operating problems occur during the startup, including detailed explanation.
 - ii. The following information for the turbines when above normal opacity has been observed by source personnel as identified in (i)(B) above:
 - A. Name of observer, position and reason for being at site;
 - B. Date and duration of above normal opacity, including start time and time normal operation was achieved;
 - C. If normal operation was not achieved within 24 minutes, an explanation why startup could not be achieved;

- D. A detailed description of the startup, including reason for operation and whether reduced loading was performed;
 - E. An explanation why reduced loading and other established startup procedures could not be performed, if not performed;
 - F. The nature of opacity following the end of startup or 24 minutes of operation, whichever occurs first, and duration of operation until achievement of normal opacity or shutdown; and
 - G. Whether exceedance of Condition 5(a) [30 percent opacity] may have occurred during startup, with explanation if qualified observer was on site.
- d. The Permittee shall keep a maintenance/repair log for each turbine.
 - e. The Permittee shall maintain the following emission records, which shall be compiled on at least a monthly basis:

The emissions of NO_x, SO₂, PM, VOM and CO from the turbines for each day since the previous record with supporting calculations; and
 - f. The Permittee shall maintain records that identify:
 - i. Any periods during which a continuous monitoring system was not operational, with explanation.
 - ii. Any day in which emission exceeded an applicable standard or limit.
 - g. The Permittee shall maintain records documenting its annual review of its operating procedures (See Condition 5).
13. All records required by this permit shall be retained for three years and shall be available for inspection and copying by the Illinois EPA.
- 14a. The Permittee shall notify the Illinois EPA within 10 days:
- i. If NO_x or CO emissions exceed 150 tons/year based on a running total of monthly data, as addressed by the records required by Condition 12(e); and
 - ii. If a turbine is operated at 101 percent or more of rated output, with duration of operation and explanation.
- b. If there is any exceedance of the requirements of Conditions 1 through 4 of this permit, as determined by the records required by this permit or by other means, the Permittee shall submit a report within 30 days after the exceedance. The report shall include the emissions released in accordance with the recordkeeping requirements, a copy of the relevant

records, and a description of the exceedance or violation and efforts to reduce emissions and future occurrences.

15. Two copies of required reports and notifications concerning equipment operation or repairs, performance testing, or a continuous monitoring system shall be sent to:

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

and one copy shall be sent to the Illinois EPA's regional office at the following address, unless otherwise indicated:

Illinois Environmental Protection Agency
Division of Air Pollution Control
2009 Mall Street
Collinsville, Illinois 62234

Telephone: 618/346-5120 Facsimile: 618/346-5155

16. If the Permittee does not initially commence construction of all six turbines, the Permittee may subsequently commence construction of the remaining provided that: 1) The facility is initially developed to support six turbines, and 2) Construction activity at the site is at no time interrupted for a period of time greater than 18 months. This Condition supersedes Standard Condition 1.
17. 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.

Please note that additional rules addressing NO_x emissions from these turbines may be adopted in the near future in response to USEPA's so called "NO_x SIP call" and the development of Illinois's plans for attainment of the ozone air quality standard in the Chicago and Metro-East ozone nonattainment areas.

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

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

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cc: Region 3

I.D. No.: 025803AAD
Application No.: 00050050
MEP Flora Power, LLC

Attachment A

Emission Units

<u>Description</u>	<u>Manufacturer</u>	<u>Number</u>	<u>Rated Heat Input¹</u> <u>(mmBtu/hr)</u>	<u>Rated Electrical Output¹</u> <u>(MW_e)</u>	<u>Control</u>
Turbines	GE	6	885	84.75	Low NO _x Combustors

¹ Ratings are the nominal output based on lower heating value of natural gas and operation at 59°F.

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