

217/782-2113

CONSTRUCTION PERMIT

PERMITTEE

HWS Energy Partners, LLC  
Attn: Lyle D. Wachtel, President  
1605 South State Street, Suite 113  
Champaign, Illinois 61820

Application No.: 02020073                      I.D. No.: 089035ABY  
Applicant's Designation: CATGENEVA              Date Received: February 20, 2002  
Subject: Natural Gas Reciprocating Engine Units (Power Generation)  
Date Issued: August 7, 2002  
Location: Geneva Generating Plant, 1717 Averill Road, Geneva

Permit is hereby granted to the above-designated Permittee to CONSTRUCT emission source(s) and/or air pollution control equipment consisting of five natural gas-fired internal combustion engines-generators, with nominal capacity of 6.0 MW each (Engines 1, 2, 3, 4 and 5) equipped with oxidation catalyst systems as described in the above-referenced application. This Permit is subject to standard conditions attached hereto and the following special condition(s):

1. Introduction

This permit is issued based on these engines (Engines 1, 2, 3, 4 and 5) equipped with oxidation catalyst systems being operated on behalf of the City of Geneva to meet electric loads, to provide reserve power capacity, and as needed to assure availability for such purpose.

2. Applicable Emission Standards

No person shall cause or allow the emission of fugitive particulate matter from any process, including any material handling or storage activity, that is visible by an observer looking generally overhead at the point beyond the property line of the source unless the wind speed is greater than 25 miles per hour, pursuant to 35 IAC 212.301 and 212.314.

3a. The emission of smoke or other particulate matter from the engines each shall not exceed an opacity greater than 30 percent, pursuant to 35 IAC 212.123(a), except as allowed by 35 IAC 212.123(b) and 212.124 or specified below.

b. The Permittee is authorized to operate the engines in excess of the 30 percent opacity limit during startup pursuant to 35 IAC 201.262, as the Permittee has affirmatively demonstrated that all reasonable efforts will be made to minimize startup emissions. This authorization is

subject to the following and may be reevaluated and revised when operating permit applications are processed for the engines:

- i. This authorization only extends for a period of up to 12 minutes for a unit, following initial firing of fuel in the engine during each startup event.
- ii. The Permittee shall maintain and follow written operating procedures designed to minimize startup emissions, the duration of startups, and minimize the frequency of startups.
- iii. The Permittee shall fulfill the applicable recordkeeping requirements of Condition 12(d).

4. New Unit Exemption Under the Federal Acid Rain Program

- a.
  - i. Fuels with a sulfur content greater than 0.05 weight percent on an annual average as determined below, shall not be fired in the new engines, pursuant to the Permittee's representation that the units are exempt from the Acid Rain Program by meeting the new units exemption requirement of 40 CFR 72.7(a). The new engines are subject to the Acid Rain Program provisions of 40 CFR 72.2 through 72.7 and 72.10 through 72.13.
  - ii. As provided by 40 CFR 72.7(d)(1), this requirement is assumed to be met because natural gas is the only fuel burned in the engines.
- b. The Illinois EPA shall be allowed to sample all fuels stored at the source.

5. Emissions Reduction Market System (ERMS)

This permit is issued based on this source being a "participating source" for purposes of the Emissions Reduction Market System (ERMS), 35 IAC Part 205. Pursuant to 35 IAC 205.150(c)(1) and 35 IAC 205.720, as of December 31 of each year, this source shall hold Allotment Trading Units (ATUs) in its account in an amount not less than the ATU equivalent of its VOM emissions during the preceding seasonal allotment period (May 1 - September 30).

6. Clean Air Act Permit Program (CAAPP)

- a. This permit is issued based on this source being a CAAPP source, because the potential emission of the source is above the applicability thresholds of the CAAPP (Refer to Section 39.5(5) of the Act).
- b. The Permittee shall submit a complete CAAPP application for the source to the Illinois EPA no later than 1 year after the initial startup of an engine, pursuant to Section 39.5(5)(x) of the Act.

7. Non-Applicability of Regulations of Concern

- a. This permit is issued based on these engines not being a major source of hazardous air pollutants pursuant to Section 112 of the Clean Air Act. This status is made enforceable by the operational and emission limitation set elsewhere in this permit.
- b. Each engine is not subject to the requirements of 35 IAC 212.321 because it does not have a process weight rate as defined in 35 IAC 211.5250.
- c. Each engine is not subject to the requirements of 35 IAC 215.143 because the blowdown emissions associated with engines are not considered to be vapor blowdown pursuant to 35 IAC 215.143.

8. Operating Requirements

- a. The only fuel fired in these engines shall be natural gas.
- b.
  - i. The annual consumption of fuel by the engines, in total, shall not exceed 825 million standard cubic feet (scf). This limit is based on operating at capacity for 18,000 engine hours per year, as indicated in the application. Compliance with this limitation shall be determined on a monthly basis from a running total of 12 months of data.
  - ii. This limit is set in conjunction with emission limits in Condition 9 to ensure that the source is not a major source. This limit may be revised upon request of the Permittee, based on the results of the emission testing required by Condition 10, if the new limitations on operation and short-term emissions would continue to ensure that the source is not a major source.
- c. The engines shall each be equipped, operated, and maintained with oxidation catalyst systems to minimize emissions of VOM and CO. These systems shall be maintained in accordance with the supplier's written maintenance procedures, or other written procedures developed by the Permittee, that provide for inspection, cleaning and replacement of the catalyst as needed to maintain catalyst effectiveness.
- d. Each affected engine shall be maintained and operated with good combustion practices to minimize emissions of NO<sub>x</sub>, CO and VOM. At a minimum, these practices shall include:
  - i. Periodic preventative maintenance and engine analysis in accordance with written procedures maintained by the Permittee with necessary adjustment to maintain each compressor/engine's performance in the same range as the initial stack test, which shall include the following:

- A. Set-up, calibrate, and synchronize the performance analysis/monitoring devices per manufacture specification.
- B. Power cylinder performance analysis with checks for combustion stability, peak pressure angle, detection of misfires, detonation, and pre-ignition.
- C. Primary and secondary ignition analysis including checking the ignition timing on each spark plug.
- D. Vibration analysis for the detection of mechanical problems such as worn leaking piston rings, piston/cylinder wear, fuel injection problems, etc.
- E. Compressor end analysis for detection of leaking valves or rings, or unnecessary recirculation of gas.
- F. Check of the IHP (indicated horsepower) on each end of each compressor cylinder. Determine the compressor load. Observe and record the PT (pressure vs. time) pattern, the PV (pressure vs. volume) pattern, and vibration traces on the analyzer oscilloscope for each cylinder.
- G. Check of the BMEP (brake mean effective pressure or compression) for each cylinder and check all hydraulic lifter adjustments.

ii. Documentation and recordkeeping for these activities.

9. Emission Limitations

- a.
  - i. Each engine shall not emit more than 17.42, 19.0, 4.83, 2.0 and 0.58 lbs/hour of nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), sulfur dioxide (SO<sub>2</sub>), volatile organic material (VOM) and particulate matter (PM), respectively. These limits represent short-term emission limits based on data from representative testing performed by the manufacturer/supplier of the engines and information provided in the permit application.
  - ii. The above limits do not apply during startup of the engines as addressed by Condition 3(b).
- b. Total annual emissions from the engines combined shall not exceed the following limits. These limits are based on the information provided in the permit application and total operation of 20,000 hours for all engines per year. Compliance with these limits shall be determined from a running total of 12 months of data and shall include all emissions from the engines, including emissions during startup. The emissions of the engines during startup

shall be assumed to be 3.0, 2.6, 0.1, 2.1 and 0.15 lb/start of NO<sub>x</sub>, CO, SO<sub>2</sub>, VOM and PM, respectively.

<u>Pollutant</u>	<u>Limit - Total of All Units (Tons/Year)</u>
NO <sub>x</sub>	177.0
CO	193.0
SO <sub>2</sub>	48.4
VOM	20.0
PM	6.2
Formaldehyde	8.0

These limitations and other requirements of this permit assure that the source is not a major source pursuant to 40 CFR 52.21, the federal rules for Prevention of Significant Deterioration (PSD) and 35 IAC Part 203, Major Stationary Sources Construction and Modification. These limitations are based on up to 400 startups per engine in each year.

10. Testing Requirements

- a. Within 60 days after operating an engine at the greatest load at which it will normally be operated but not later than 180 days after installation, the Permittee shall perform emissions tests of the engines 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 independent testing service at maximum load for NO<sub>x</sub>, CO, and VOM. During the initial performance tests, emissions shall also be measured at the minimum load and an intermediate load level for NO<sub>x</sub>, CO, and VOM. The low load and intermediate load testing may be achieved through 20 minute test runs.
- c. The following USEPA methods and procedures shall be used for testing of emissions.

Location of Sample Points	USEPA Method 1 or 19
Gas Flow and Velocity	USEPA Method 2 or 19
Flue Gas Weight	USEPA Method 3 or 3A or 19
Moisture	USEPA Method 4 or 19
Nitrogen Oxides	USEPA Method 20
Carbon Monoxide	USEPA Method 10
Volatile Organic Material	USEPA Method 18 or 25A

- 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 engine will be tracked and recorded.
  - iii. The specific determinations of emissions that are intended to be made, including sampling and monitoring locations.
  - 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 Illinois EPA 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. The Final Reports for these tests shall be forwarded to the Illinois EPA 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 ft<sup>3</sup>);
    - B. Firing rate (million Btu/hour);
    - C. Engine output rate (HP), with supporting data and calculations; and
    - D. Engine burner settings, e.g., burner excess air and pressure settings.

- v. Data and calculations, including copies of all raw data sheets and records of laboratory analysis, sample calculations, and data on equipment calibration.

11. Monitoring Requirements

On at least an annual basis or every 5,000 total engine operating hours for the plant\*, whichever is less frequent, the Permittee shall measure the NO<sub>x</sub> and CO emissions from the affected engines using portable analyzers. As an alternate to such measurements, measurements may be conducted in 20 minute test runs using the procedures specified by Condition 10.

\* For this purpose, the operating hours of each individual engine shall be added together to provide total engine operating hours.

12. Records

- a. The Permittee shall maintain the following records related to sulfur-content of fuel:
  - i. Records for the sulfur content of natural gas, and supplier;
  - ii. Records of operation of an engine with natural gas containing in excess of 0.05 weight percent sulfur, with date, duration, sulfur content, and explanation.
- b. The Permittee shall maintain a file for the affected engines that includes:
  - i. The rated output of each engine in horsepower, as specified by the manufacturer or determine through performance testing.
  - ii. The design settings for the combustion control systems.
  - iii. The manufacturer's recommended maintenance practice for the combustion control system.
  - iv. The maintenance practices that the Permittee will follow if different or more detailed than the manufacturer. [See Condition 8(d)(i)]
  - v. The VOM emission factors for engine blowdown with supporting information (e.g., exhaust volume and VOM content).
- c. The Permittee shall maintain the following operating records:
  - i. Total usage of fuel for the engines, i.e., scf/month and scf/year; and

- ii. Fuel usage of individual engines or other operating data, e.g., hours of operation or megawatts generated from each engine, to allow total fuel usage, as recorded above, to be apportioned among the individual engines as necessary to calculate emissions.
- d. The Permittee shall maintain records for each startup of each engine, that at a minimum shall include:
  - i. The following information for each startup of an engine:
    - A. Date and time of startup; and
    - B. A description of startup, if operating problems are identified during the startup.
  - ii. The following information for each engine when above normal opacity has been observed by source personnel:
    - 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 normal operation could not be achieved in 24 minutes;
    - D. A detailed description of the startup, including reason for operation and an explanation why established startup procedures could not be performed, if not performed;
    - E. 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
    - F. Whether exceedance of Condition 3(a) may have occurred during startup, with explanation, if qualified observer was on-site.
- e. The Permittee shall maintain the following emission records for the engines:
  - i. A copy of all testing and monitoring conducted pursuant to Conditions 10 and 11.
  - ii. Annual aggregate NO<sub>x</sub>, CO, SO<sub>2</sub>, VOM, PM, and formaldehyde emissions from the engines, based on hours of operation and number of startups and the applicable emission factors, with supporting calculations.

- f.
      - i. The Permittee shall keep a copy of its maintenance procedures and associated oxidation catalyst systems, including a copy of any procedures from the equipment supplier that are being relied upon.
      - ii. The Permittee shall keep an inspection/maintenance and repair log for each engine, including the associated oxidation catalyst system, listing each activity performed with date.
- 13. All records and logs required by this permit shall be retained at a readily accessible location at the source for at least three years from the date of entry and shall be made available for inspection and copying by the Illinois EPA upon request. Any records retained in an electronic format (e.g., computer) shall be capable of being retrieved and printed on paper during normal source office hours so as to be able to respond to an Illinois EPA request for records during the course of a source inspection.
- 14a. If there is an exceedance of the requirements of this permit as determined by the records required by 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 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.
- b. The Permittee shall provide an annual report, submitted with the Annual Emission Report concerning startup of engines. At a minimum, this report shall include:  
  
For each engine, the total number of startups.
- 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

Fax: 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  
9511 West Harrison  
Des Plaines, Illinois 60016

Telephone: 847/294-4000

Fax: 847/294-4018

16. Compliance Procedures

Compliance with the emission limitations in Condition 9(b) shall be based on the recordkeeping required by Condition 12 and calculated based on appropriate emission factors and the formulas listed below:

Notwithstanding these specified compliance procedures, any person (including the Permittee) may also use other credible evidence to establish compliance or noncompliance with applicable requirements.

a. Blowdown Emissions

VOM Emissions = Blowdown Emission Factor x Number of Startups

b. Combustion Emissions

i. Emissions = Appropriate Emission Factor x Engine Operation

ii. A. Emissions factors for NO<sub>x</sub>, CO and VOM shall be based on the results of emission testing and monitoring conducted pursuant to Conditions 10 and 11.

B. Until the results of such testing are available, emissions shall be determined assuming that engines operate only at full load.

iii. Emission factors for pollutants other than NO<sub>x</sub>, CO and VOM shall be based on the standard emission factors from the USEPA's Compilation of Air Pollutant Emission Factors, AP-42, or for formaldehyde from appropriate Gas Research Institute factors.

17a. Operation of the emission units included in this permit shall not begin until all associated air pollution control equipment has been constructed and is operational.

b. i. Under this permit, each engine may be operated for a period of up to 180 days from initial startup to allow for equipment shakedown and emission testing as required. This period may be extended by the Illinois EPA upon request by the Permittee if additional time is needed to complete shakedown or perform emission testing.

ii. Upon successful completion of emission testing demonstrating compliance with applicable short-term limitations, the Permittee may continue to operate the affected engines provided a complete CAAPP application is submitted within 12 months of initial

startup, as addressed by Section 39.5(5) of the Environmental Protection Act.

18. This permit 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 call Youra Benofamil at 217/782-2113.

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

DES:YB:psj

cc: Region 1