



shall comply with applicable requirements of the Turbine NSPS and related requirements of 40 CFR 60 Subpart A, General Provisions, including the following requirements.

- ii. Pursuant to 40 CFR 60.4320(a), the Permittee shall comply with the applicable standards for NO<sub>x</sub> emissions in Table 1 of 40 CFR 60 Subpart KKKK for turbines with a design heat input of between 50 and 850 mmBtu/hour, that is:
    - A. For the CHP unit, either with the HRSG operating or in bypass mode - 25 ppm at 15 percent O<sub>2</sub>.
    - B. For the HRSG while operating in standalone mode (i.e., independently of the turbine) - 54 ppm at 15 percent O<sub>2</sub>.
  - iii. Pursuant to 40 CFR 60.4330(a), the Permittee shall comply with applicable standards for sulfur dioxide (SO<sub>2</sub>) emissions, that is, the Permittee must either not cause to be discharged into the atmosphere from the turbine any gases which contain SO<sub>2</sub> in excess of 0.90 lb/MW-hr gross output or not burn any fuel in the turbine which contains total potential sulfur emissions in excess of 0.060 lb SO<sub>2</sub>/mmBtu heat input.
  - iv. Pursuant to 40 CFR 60.11(d) and 60.4333(a), the Permittee must operate and maintain the CHP unit, including associated air pollution control and monitoring equipment, in a manner consistent with good air pollution control practices for minimizing emissions at all times including during startup, shutdown, and malfunction.
- b. i. The emissions of smoke or other particulate matter from the CHP unit shall not have an opacity greater than 30 percent, pursuant to 35 IAC 212.123(a), except as provided in 35 IAC 212.123(b).
  - c. i. Pursuant to 35 IAC 217.388(a)(1)(E), the Permittee shall limit the concentration of NO<sub>x</sub> in the gases discharged into the atmosphere by the CHP unit to no more than 42 ppmv, corrected to 15 percent O<sub>2</sub> on a dry basis.
  - ii. The Permittee shall inspect and perform periodic maintenance on the CHP unit in accordance with 35 IAC 217.388(a)(4).
3. Non-Applicability Provisions
- a. This permit is issued based on this project not constituting a major modification under the federal rules for Prevention of Significant Deterioration (PSD), 40 CFR 52.21, or the state rules for Major Stationary Sources Construction and Modification (MSSCAM), 35 IAC Part 203. For emissions of NO<sub>x</sub>, this is because the net increase in emissions will not be significant. For other regulated NSR pollutants, this is because the emissions of the pollutants from this project are not significant. (See Condition 5 and Attachments 1 and 2.)

- b. This permit is issued based on the CHP unit not being subject to the emission standards of the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Stationary Combustion Turbine, 40 CFR 63 Subpart YYYYY. This is because this source is not a major source of HAP emissions.
  - c. This permit is issued based on the CHP unit not being subject to the emission standards of the NESHAP for Industrial, Commercial and Institutional Boilers, 40 CFR 63 Subpart JJJJJJ. This is because the duct burners only fire natural gas and gas-fired units are excluded from the requirements of this NESHAP, pursuant to 40 CFR 63.11195(e).
  - d. This permit is issued based on the turbine not being subject to 35 IAC 216.121, emissions of carbon monoxide (CO). This is because combustion turbines are not fuel combustion units as defined by 35 IAC 211.2470.
  - e. This permit is issued based on the HRSG not being subject to the requirements of 35 IAC Part 217 Subpart E, Industrial Boilers. This is because a heat recovery steam generator that captures waste heat from a combustion turbine is not an industrial boiler as defined by 35 IAC 211.3100.
4. Operational Limits and Work Practices
- a. Natural gas shall be the only fuel fired in the CHP unit.
  - b. The design heat inputs, in million Btu per hour (mmBtu/hr), high heating value (HHV), of the turbine and the duct burners shall not exceed the following limits:
    - i. Turbine - 90.9 mmBtu/hr.
    - ii. Duct burners - 122.1 mmBtu/hr.
  - c. The fuel usage of the CHP unit shall not exceed the following limits:
    - i. Total - 136.8 mmscf/month and 1,128.8 mmscf/year.
    - ii. Duct burners (total) - 100 mmscf/month and 513.7 mmscf/year.
    - iii. Duct burners (standalone mode) - 83.8 mmscf/year.
    - iv. Compliance with the above annual limits and other annual limits in this permit shall be determined from a running total of 12 months of data, i.e., from the sum of the data for the current month plus the preceding 11 months (running 12 month total).
  - d. The Permittee shall permanently cease operation and decommission existing Boiler 3 no later than the date of the initial startup of the affected turbine, i.e., the date that the affected turbine is first fired and emissions first occur.

5. Emission Limits

- a. Emissions of NO<sub>x</sub>, CO, PM/PM<sub>10</sub> and VOM from the CHP unit shall not exceed the applicable limits in Attachment 1. For this purpose, for periods when the turbine and duct burners are operating (supplemental mode), the CHP unit is subject to an overall limit that is the sum of: 1) The product of the hourly limit in Table 1B and the firing rate of the duct burners; and 2) The product of the limit in lb/mmBtu in Table 1C and the firing rate of the duct burners.
- b. The SO<sub>2</sub> emissions of the CHP unit shall not exceed 0.2 tons/month and 1.2 tons/year.
- c. The GHG emissions of the CHP unit, as CO<sub>2</sub>e, shall not exceed 8,000 tons/month and 65,775 tons/year.

6-1. Emission Testing Requirements for NO<sub>x</sub>

- a. For the CHP unit, the Permittee shall comply with the applicable testing requirements of NSPS for NO<sub>x</sub> emissions, including:
  - i. Having initial performance tests conducted for the unit in accordance with 40 CFR 60.8(a), which tests shall include separate tests for the following configurations of the CHP unit: operation without firing of the duct burners, operation with supplemental firing of the duct burners and standalone operation of the HRSG.
  - ii. Conducting initial and subsequent performance test(s) in accordance with the applicable requirements of 40 CFR 60.8(b) and (f), 60.4400 and 60.4415.
  - iii. Providing advance notification of performance test(s) to the Illinois EPA in accordance with 40 CFR 60.8(d).
- b. The Permittee shall also comply with the applicable testing requirements of 35 IAC 217.394(a), (b) and (c) related to NO<sub>x</sub> emissions.
- c. Three copies of the Final Reports for these emission tests shall be forwarded to the Illinois EPA, within 60 days after the completion of testing. The Final Report from testing shall, at a minimum, contain:
  - i. A summary of results, including emission in pounds/hour and pounds/mmBtu for each operational configuration of the CHP unit.
  - ii. General information.
  - iii. Description of test method(s), including a description of sampling point(s), sampling train, analysis equipment, and test schedule.

- iv. Detailed description of CHP operating conditions during testing, including fuel consumption and firing rates, electrical output (MW-hr), and key operating parameters of the turbine and HRSG.
- v. Data and calculations, including copies of all raw data sheets and records of laboratory analysis, sample calculations, and data on equipment calibration.
- vi. Information for opacity observations conducted in conjunction with emission testing pursuant to Condition 6-3(a)(i), which shall include the information specified by Condition 6-3(c), or a statement that visible emissions were not present during testing.

6-2. Emission Testing Requirements for Pollutants Other Than NOx

- a. For the CHP unit, the Permittee shall have performance tests conducted for emissions of pollutants other than NOx as follows:
  - i. Initial performance tests for emissions of CO and VOM shall be conducted within one year (365 days) of initial startup of the CHP unit, which tests shall include tests for operation without firing of the duct burners and either operation with supplemental firing of the duct burners or standalone operation of the HRSG.
  - ii. Performance tests shall be conducted within 180 days of a written request from the Illinois EPA for emission of CO, VOM, PM/PM<sub>10</sub>, N<sub>2</sub>O and/or methane, as specified by the request, under such mode(s) of operation as also specified by the request.
  - iii. These tests shall be conducted using applicable USEPA test methods, as may be specified by the Illinois EPA in a request for testing or such other applicable USEPA test methods approved in advance by the Illinois EPA.
- b. The Illinois EPA shall be notified prior to these emission tests to enable the Illinois EPA to observe these tests. Written notification for the expected date of testing shall be submitted a minimum of 30 days prior to the expected date. Written notification of the actual date and expected time of testing shall be submitted a minimum of five 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.
- c. Three copies of the Final Reports for these emission tests shall be forwarded to the Illinois EPA, within 60 days after the completion of testing. The Final Report from testing shall, at a minimum, contain the information specified by Condition 6-1(c)(i) through (v).

6-3. Opacity Observation Requirements

- a. The Permittee shall have the opacity of the emissions from the CHP unit during representative operating conditions determined by a qualified observer in accordance with USEPA Method 9, as further specified below.
  - i. Observations shall be conducted during the emission testing required by Condition 6-1 unless visible emissions, as determined by USEPA Method 22, are not present.
  - ii. Following the initial observations, periodic observations of opacity shall be conducted at least every year for the CHP unit if visible emissions, as determined by USEPA Method 22, are normally present when the unit is operating.
  - iii. Upon written request by the Illinois EPA, opacity observations shall be conducted for the CHP unit within 60 calendar days of the request or by the date agreed upon by the Illinois EPA, whichever is later.
- b. The duration of opacity observations shall be at least 30 minutes (five 6-minute averages) unless the average opacities for the first 12 minutes of observations (two 6-minute averages) are both less than 10.0 percent.
- c. The Permittee shall submit a written report for these observations which report shall be submitted within 30 days of the date of observations unless these observations are conducted in conjunction with testing required by Condition 6-1,. This report shall include:
  - i. Date and time of observations.
  - ii. Name and employer of qualified observer.
  - iii. Copy of current Method 9 certification.
  - iv. Description of weather observation conditions during observations.
  - v. Description of the operating conditions of the CHP unit.
  - vi. Raw data.
  - vii. Opacity determinations.
  - viii. Conclusions.

7-1. Emissions Monitoring Requirements

- a. For the CHP unit the Permittee shall conduct monitoring to demonstrate compliance with the NSPS standard for NO<sub>x</sub> in accordance with 40 CFR 60.4340. For this purpose, if the Permittee elects to operate in

accordance with a parametric monitoring plan, as provided for by 40 CFR 60.4340(b), the Permittee shall comply with the applicable requirements for such plans in 40 CFR 60.4355.

- b. For the CHP unit, the Permittee shall comply with the applicable monitoring requirements of 35 IAC 217.394(d) or (e) related to NOx emissions.

7-2. Operational Monitoring Requirements

- a. For the CHP unit, the Permittee shall install, operate, and maintain monitors to separately measure and record fuel consumption by the turbine and the duct burners.

7-3. Fuel Sampling and Analysis Requirements

- a. The Permittee shall determine the total sulfur content of the fuel combusted in the CHP unit in accordance with 40 CFR 60.4360 and 60.4370 or satisfy the requirements of 40 CFR 60.4365 for the fuel.

8. Recordkeeping Requirements

- a. For the CHP unit, the Permittee shall comply with the applicable recordkeeping requirements of the Turbine NSPS, including 40 CFR 60.7(b) and (f) and 60.4375.
- b. For the CHP unit, the Permittee shall comply with the applicable recordkeeping requirements of 35 IAC 217.396(a).
- c. The Permittee shall maintain a file or other records containing the following information for the CHP unit:
  - i. The manufacturer's specifications for the unit including emissions guarantees, rated heat input capacity (mmBtu/hour), and operating and maintenance procedures recommended by the manufacturer.
  - ii. The heat content, both HHV and LHV, of the fuel fired in the unit (Btu/scf).
  - iii. The Permittee's established procedures for startup of the unit.
- d. The Permittee shall keep the following operating records for the CHP unit on a monthly basis:
  - i. Operating hours by mode of operation, i.e., operation without firing of the duct burners, operation with supplemental firing of the duct burners and standalone operation of the HRSG (hours/month and hours/year).
  - ii. Fuel usage by mode of operation (scf/month and scf/year).

- iii. Number of startups (number/month and number/year)
- e. The Permittee shall maintain the following records for the CHP unit:
  - i. An operating log, which at a minimum shall include information for each startup of the unit, including date and description of startup, e.g., startup following scheduled maintenance outage.
  - ii. Inspection, maintenance, and repair log, including date and nature of activity.
- f. The Permittee shall maintain the following records related to the emissions of the CHP unit and compliance with the limits in Condition 5:
  - i. A file containing the following information for emissions rates, of the CHP unit, with supporting documentation, which information shall be kept current:
    - A. Unless actual NO<sub>x</sub> emissions are determined by monitoring in accordance with the NSPS, the NO<sub>x</sub> emission rates for the turbine and the HRSG (lb/hr and lb/mmBtu) used by the Permittee to determine NO<sub>x</sub> emissions during different modes of operation, including startup and shutdown.
    - B. The CO emission rates for the turbine and the HRSG (lb/hr and lb/mmBtu) used by the Permittee to determine CO emissions during different modes of operation, including startup and shutdown.
    - C. The emission rates for the turbine and the HRSG (lb/hr) used by the Permittee to determine PM/PM<sub>10</sub> and VOM emissions.
    - D. The emission factor (lb/mmscf) used by the Permittee to determine SO<sub>2</sub> emissions.
    - E. The emission factors (lb/hr or lb/mmscf) used by the Permittee to determine emissions of individual and total hazardous air pollutants (HAPs).
    - F. The emission factors for CO<sub>2</sub>, N<sub>2</sub>O and methane (lb/mmscf) used by the Permittee to determine GHG emissions, as CO<sub>2</sub>e.
  - ii. Records of the actual emissions on a monthly basis of NO<sub>x</sub>, CO, PM/PM<sub>10</sub>, VOM, SO<sub>2</sub>, HAP, HAPs and GHG, as CO<sub>2</sub>e (tons/month and tons/year), with supporting calculations.
- g. The Permittee shall keep records for all opacity measurements made in accordance with USEPA Method 9 for the CHP unit that it conducts or that are conducted at its behest by individuals who are qualified to make such observations. For each occasion on which such measurements are made, these records shall include the formal report for the

measurements if conducted pursuant to Condition 6-2, or otherwise the identity of the observer, a description of the measurements that were made, the operating condition of the unit, the observed opacity, and copies of the raw data sheets for the measurements.

- h. All records and logs required by this permit shall be retained at a readily accessible location at the source for at least five years from the date of entry and shall be made available for inspection and copying by the Illinois EPA or USEPA 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 or USEPA request for records during the course of a source inspection.

9. Reporting Requirements

- a.
  - i. For the CHP unit, the Permittee shall comply with the applicable notification and reporting requirements of the NSPS, including 40 CFR 60.7(a), (c), (d) and (e) and 60.4380.
  - ii. With the notification for initial startup of the unit pursuant to 40 CFR 60.7(a), the Permittee shall identify the approaches that will initially be used under the NSPS to comply with requirements for SO<sub>2</sub> and to monitor NO<sub>x</sub> emissions when exhaust is through the HRSG stack and when exhaust is through the bypass stack.
- b. For the CHP unit, the Permittee shall comply with the applicable reporting requirements of 35 IAC 217.396(c).
- c. If there is a deviation of the requirements of this permit, not otherwise addressed pursuant to the above reporting requirements, the Permittee shall submit a report to the Illinois EPA within 30 days after deviation. The report shall include a description of the deviation, the probable cause of the deviations, the corrective actions that were taken and any actions taken to reduce future occurrences.
- d. The Permittee shall notify the Illinois EPA when existing Boiler 3 is permanent shut down and decommissioned. This notification shall be submitted within 30 days and include the date of decommissioning and a description of method of decommissioning.
- e. Two copies of all reports and notifications required by this permit 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:

Illinois Environmental Protection Agency  
Division of Air Pollution Control - Regional Office  
9511 Harrison Street  
DesPlaines, Illinois 60016

Telephone: 847/294-4000

Fax: 847/294-4018

10. Authorization for Operation

- a. Under this permit, the CHP unit may be operated for a period of up to one year (365 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 completion of the emission testing required by Condition 6-1(a)(i) and 6-2(a)(i), the Permittee may continue to operate the CHP unit until a new or revised CAAPP permit is issued, as allowed by Section 39.5(5) of the Environmental Protection Act.
- c. This condition supersedes Standard Condition 6.

If you have any questions on this permit, please call Manish Patel at 217/785-1705.

Robert W. Bernoteit  
Acting Manager, Permit Section  
Division of Air Pollution Control

Date Signed: \_\_\_\_\_

RWB:MNP:jws

cc: FOS - Region 1, Illinois EPA  
CAAPP Application File - 95090195, Illinois EPA,  
Lotus Notes

Attachment 1: Emission Limits for NO<sub>x</sub>, CO and PM/PM<sub>10</sub>

Table 1A: Limits for Total Emissions of the CHP Unit

Pollutant	Tons/Month	Tons/Year
NO <sub>x</sub>	6.0	47.6
CO	7.0	55.9
PM/PM <sub>10</sub>	1.2	9.2
VOM	0.9	7.4

Table 1B: Limits for the Turbine

Pollutant	Lbs/mmBtu, LHV	Lbs/Hour	Tons/Year <sup>3</sup>
NO <sub>x</sub>	0.060	4.5 <sup>1</sup>	17.1 <sup>4</sup>
CO	0.061	4.5 <sup>2</sup>	29.7 <sup>4</sup>
PM/PM <sub>10</sub>	--	1.7	6.6
VOM	--	0.5	2.2 <sup>4</sup>

<sup>1</sup> NO<sub>x</sub> lb/hour limit reflects 15 ppmvd and 0.060 lb/mmBtu (LHV).

<sup>2</sup> CO lb/hour limit reflects 25 ppmvd and 0.061 lb/mmBtu (LHV).  
Limit does not apply during startup and shutdown.

<sup>3</sup> Annual limit is based on continuous operation at the seasonally adjusted maximum heat input rate to the turbine, i.e., operation at an average inlet air temperature of 52°F.

<sup>4</sup> Annual limits are based on continuous operation, as above, including emissions during startup and shutdown. In particular, for NO<sub>x</sub>, CO, and VOM this limit accommodates 50 startup and shutdown cycles per year with 9, 504, and 6 pounds of additional emissions per cycle, respectively.

Table 1C: Limits for the HRSG

Pollutant	Lbs/mmBtu, HHV	Lbs/Hour		Tons/Year
		Supplemental <sup>2</sup>	Standalone <sup>3</sup>	
NO <sub>x</sub>	Note 1	8.6	18.3	30.5 <sup>4</sup>
CO	0.10	7.8	12.2	26.2 <sup>5</sup>
PM/PM <sub>10</sub>	0.01	0.8	1.2	2.6 <sup>5</sup>
VOM	0.02	1.6	2.4	5.2 <sup>5</sup>

<sup>1</sup> Limits are 0.11 and 0.15 lb/mmBtu for supplemental and standalone modes, respectively.

<sup>2</sup> Hourly limits are based on expected maximum firing rate in supplemental mode, i.e., 78.2 mmBtu/hr.

<sup>3</sup> Hourly limits are based on maximum firing rate in standalone mode, i.e., 122.1 mmBtu/hr.

<sup>4</sup> Annual limits are based on maximum operation per Condition 4(c), i.e., 83.8 mmcf/year in standalone mode, with remaining operation in supplemental mode, i.e., 429.9 mmcf/year.

<sup>5</sup> Annual limits are based on maximum operation per Condition 4(c), i.e., 513.7 mmcf/year.

Attachment 2

Evaluation of Net Change in Emissions of NO<sub>x</sub> for Purposes of  
Major Stationary Sources Construction And Modification (MSSCAM) And  
Prevention of Significant Deterioration (PSD)

Table 1

Net Changes in NO<sub>x</sub> Emissions Over Five-year Contemporaneous Period (Tons/Year)

Scenario/Project	Change in Emissions	
	MSSCAM	PSD
Increase from Current Project (CHP project)	47.6	47.6
Contemporaneous Increases		
Building Construction/Demolition <sup>1</sup>	1.1	1.1
Subtotal	48.7	48.7
Contemporaneous Decreases		
Shut Down of Boiler 3 (See Table 2)	- 10.0	- 12.4
Net Change	38.7	36.3
Significant Emission Rate for NO <sub>x</sub>	40	40

<sup>1</sup> Net NO<sub>x</sub> emission increase conservatively determined considering only the emission increases due to changes in steam load from construction and demolition of buildings during the contemporaneous period and not the decrease in steam load from energy savings projects at the campus.

Table 2

NO<sub>x</sub> Emissions Decreases from Shut Down of Boiler 3  
Past Actual NO<sub>x</sub> Emissions from the Boiler 3 (Tons/Year)<sup>1</sup>

Emission Unit	NO <sub>x</sub> Emissions Decrease (Tons/Year)	
	MSSCAM	PSD
Boiler 3	10.0 <sup>2</sup>	12.4 <sup>3</sup>

<sup>1</sup> The shut down of this boiler will also be accompanied by decreases in emissions of other pollutants. Under MSSCAM, the decreases in emissions of PM<sub>2.5</sub> and VOM are projected at 0.8 and 0.6 tons/year, respectively, considering representative operation. Under PSD, the decreases in CO and PM/PM<sub>10</sub> are projected at 10.4 and 0.9 tons/year, respectively, considering highest 24-months in ten-year look-back period.

<sup>2</sup> For MSSCAM, the decrease is the average annual actual NO<sub>x</sub> emissions for two-year period ending on October 2011, which is considered representative of normal operation than the two-year period immediately preceding the submission of the permit application, as the Boiler was taken out of service at the end of June 2012 and prior to that period from November 2011 it was idled at low fire and used as a standby boiler.

<sup>3</sup> For PSD, the decrease is the average annual actual NO<sub>x</sub> emissions for the 24-month period ending on December 2004, which is the highest 24-month average from the ten-year look-back period.