Connecticut Department of

ENERGY &
ENVIRONMENTAL
PROTECTION

BUREAU OF AIR MANAGEMENT
NEW SOURCE REVIEW PERMIT
TO CONSTRUCT AND OPERATE A STATIONARY SOURCE

Issued pursuant to Title 22a of the Connecticut General Statutes (CGS) and Section 22a-174-3a of the Regulations of Connecticut State Agencies (RCSA).

Owner/Operator	Milford Power Company, LLC
Address	55 Shelland Street, Milford, CT 06460
Equipment Location	55 Shelland Street, Milford, CT 06460
Equipment Description	ABB GT-24 combustion turbine train #1 with two natural gas fired chillers
Town-Permit Numbers	105-0068
Premises Number	251
Stack Number	1
Modification Issue Date	September 11, 2014
Prior Permit Issue Dates	April 16, 1999 November 19, 2004 April 26, 2007
Expiration Date	None

/s/Anne Gobin for
Robert J. Klee
Commissioner

September 11, 2014
Date

This permit specifies necessary terms and conditions for the operation of this equipment to comply with state and federal air quality standards. The Permittee shall at all times comply with the terms and conditions stated herein.

PART I. OPERATIONAL CONDITIONS

A. Operating Limits

1. Fuel Type(s): natural gas, No. 2 fuel oil
2. Maximum Fuel Consumption over any Consecutive 12 Month Period: 15,663 MMcf (gas) (chillers included), 11.08 MMgal (oil)
3. Fuel Sulfur Content (% by weight, dry basis): 0.0025% (gas) 0.05% (oil)
4. For start-up, shutdown, fuel switching, equipment tuning and protective load shed, each such event shall not exceed 240 minutes.

B. Design Specifications

1. Maximum Fuel Firing Rate(s)[1]:

T<0°F:	2.095 MMcf/h (gas), 15,519 gph (oil)
0°F ≤ T ≤ 100°F:	2.095 - 2.25x10^{-3} x T MMcf/h (gas)
	15,519 - 16.67 x T gph (oil)
T > 100°F:	1.87 MMcf/h (gas), 13,852 gph (oil)

2. Maximum Gross Heat Input (MMBtu/h)[1,2]:

T < 0°F:	2,095
0°F ≤ T ≤ 100°F:	2,095 – 2.25 x T
T > 100°F:	1,870

3. Minimum Stack Height (ft): 135
4. Minimum Exhaust Gas Flow Rate @ 100% load (acfm): 865,000 (gas), 1,085,000 (oil)
5. Stack Exit Temperature @ 100% load (°F): 220
6. Minimum Distance from Stack to Property Line (ft): 300

[1] - T = ambient temperature (°F)
[2] - based on a gross heating value of 1000 Btu/scf

PART II. CONTROL EQUIPMENT (Applicable if -X- Checked)

(See Appendix E for Specifications)

A. Type

- ☐ None
- ☐ Scrubber
- ☐ Electrostatic Precipitator
- ☐ Cyclone
- ☐ Multi-Cyclone
- ☐ Thermal DeNOx
- ☐ Selective Non-Catalytic Reduction
- ☒ Selective Catalytic Reduction
- ☒ Low NOx Burner
- ☐ Fabric Filter
- ☐ Particulate Trap
- ☒ Other: CO oxidation catalyst

B. Minimum Efficiency

Low NO_x Burner Design Specification: Reduce NO_x inlet concentration to SCR below 25 ppmvd @ 15% O_2
Selective Catalytic Reduction: Reduce NO_x concentration to 2 ppmvd @ 15% O_2 (gas), 5.9 ppmvd @ 15% O_2 (oil)
CO Oxidation Catalyst Design Specification: Removal efficiency of 76%

PART III. DEFINITIONS

A. Start-up shall be defined as that period of time from initiation of combustion firing until the unit reaches steady state operation.

B. Shutdown shall be defined as that period of time from the initial lowering of the turbine output until the point at which the combustion process has stopped.

PART III. DEFINITIONS, continued

C. Re-commissioning shall be defined as the manufacturer's required period of equipment tuning conducted after completion of a major inspection. If the unit is commissioned on more than one fuel, re-commissioning on each fuel shall be considered a separate re-commissioning event.

D. Malfunction means any sudden, infrequent and not reasonably preventable failure of air pollution control equipment, process equipment or a process to operate in a normal or usual manner. Failures that are caused in part by poor maintenance, careless operation or any other preventable upset condition or careless operation are not malfunction.

E. Protective load shed means an event during which the unit reduces load to less than 50% load without stopping the combustion process, either because of direction from ISO New England or to protect the turbine.

PART IV. CONTINUOUS EMISSION MONITORING REQUIREMENTS AND ASSOCIATED EMISSION LIMITS (Applicable if -X- Checked)

CEM shall be required for the following pollutant/operational parameters and enforced on the following basis:

Pollutant/Operational Parameter	Averaging Times	Emission Limit
☒ Fuel flow	continuous	see Part I.A
☒ Opacity[1]	six minute block	10%
☐ SOx		
☒ NOx	3 hour rolling	see Part VI
☒ CO	1 hour block	see Part VI
☒ O_2	1 hour block	used to correct to $\%O_2$
☒ NH_3	3 hour block	10 ppmv
☐ Exhaust flow		
☒ Ambient temperature	continuous	

[1] – Required during No. 2 fuel oil firing only

PART V. MONITORING AND RECORD KEEPING REQUIREMENTS

A. Monitoring

1. The Permittee shall monitor annual operating hours and fuel consumption. This calculation shall be based on any consecutive 12 month time period and shall be determined by adding the current month's operating hours and fuel usage (for each fuel) to that of the previous 11 months. The Permittee shall make these calculations monthly.

2. When more than one fuel supply tank is to service this source or when multiple sources are supplied by one fuel tank, the Permittee shall use a non-resettable totalizing fuel metering device to continuously monitor fuel feed to this permitted source.

3. Each oil fuel shipment for this equipment shall include a shipping receipt from the fuel supplier and a certification from the fuel supplier certifying the type of fuel in the shipment and the weight percent of sulfur in the fuel. The shipping receipt and/or certification shall include the name of the oil supplier, the sulfur content of the oil and the method used to determine the sulfur content of the oil. The shipping receipt and certification are not required if the shipment is part of a contract between the Permittee and the fuel supplier that specifies the type of fuel, the weight percent of sulfur in the fuel and the method used to determine the sulfur content in the fuel to be shipped. The Permittee shall maintain records of each shipping receipt and certification or contract with the fuel supplier.

4. The Permittee shall install, calibrate, maintain and operate CEM equipment in accordance with RCSA §22a-174-4 and any applicable requirements in Appendix A. All monitors shall be incorporated into the CEM Plan.

PART V. MONITORING AND RECORD KEEPING REQUIREMENTS, continued

B. Record Keeping

1. The Permittee shall keep records of annual operating hours and fuel consumption. Annual operating hours and fuel consumption shall be based on any consecutive 12 month time period and shall be determined by adding the current month's operating hours and fuel usage (for each fuel) to that of the previous 11 months. The Permittee shall make these calculations within 30 days of the end of the previous month.

2. The Permittee shall keep records of the fuel certification for each delivery of fuel from a bulk petroleum provider or a copy of the current contract with the fuel supplier supplying the fuel used by the equipment that includes the applicable sulfur content of the fuel as a condition of each shipment. The shipping receipt or contract shall include the date of delivery, the name of the fuel supplier, type of fuel delivered, the percentage of sulfur in such fuel, by weight, dry basis, and the method used to determine the sulfur content of such fuel.

3. The Permittee shall keep records of turbine load with ambient temperature. These will be used to determine compliance with VOC emission rates in this permit.

4. The Permittee shall keep records of event based emissions and event durations as shown in Part VI.A of this permit.

5. The Permittee shall keep records on premises indicating continual compliance with all above conditions at all times and shall make them available upon request by the commissioner for the duration of this permit, or for the previous five years, whichever is less.

PART VI. ALLOWABLE EMISSION LIMITS

The Permittee shall not exceed the emission limits stated herein at any time.

A. Start-up, Shutdown, Fuel Switching, Equipment Tuning, Protective Load Shed and Re-commissioning

1. The Permittee shall not exceed the following emission rates for NO_x, CO and VOC during start-up, shutdown, fuel switching, equipment tuning, protective load shedding and re-commissioning events. The NO_x and CO emission shall be tracked using CEMS. VOC emissions shall be correlated to CO emissions using the results of a diagnostic stack test and tracked using the CO CEMS.

Criteria Pollutant	Start-up (lb/event)	Shutdown (lb/event)	Fuel Switching, Equipment Tuning (lb/event)	Protective Load Shed (lb/event)	Re-commissioning[1] (lb/hr)
NO_x	1,720	530	1,720	2,250	530
CO	770	240	770	1,010	240
VOC	154	48	154	202	48

[1] – During re-commissioning, the maximum duration the unit may operate at these emission limits (not including start-up and shutdown events) is 30 hours. The allowable emissions set forth in Parts VI.B and VI.C shall apply during the rest of the re-commissioning event.

2. Operating requirements for start-up, shutdown and fuel switching, equipment tuning, protective load shed and re-commissioning periods:

   a. The frequency and duration of operation during these periods shall be minimized to the maximum extent practicable;

   b. All possible steps shall be taken to minimize the impact of emission during these periods;

   c. At all times, the turbine shall be operated in a manner consistent with good engineering practice for minimizing emissions and the Permittee shall have the best efforts regarding planning, design and operating procedures to meet the otherwise applicable emission limitation; and

   d. The Permittee's actions during these periods shall be documented by properly signed, contemporaneous operating logs or other relevant evidence.

PART VI. ALLOWABLE EMISSION LIMITS, continued

B. Natural Gas Fired (Turbine #1 only)

Criteria Pollutants	lb/hr	lb/MM BTU	ppmvd	TPY
TSP	19.9	0.0095		80.2
PM-10	19.9	0.0095		80.2
SO_x	4.4	0.0021		17.5
NO_x	14.2	0.0074	2.0	56.9
VOC[1]	3.0			see Part VI.D
VOC[2]	2.2			
VOC[3]	3.0			
VOC[4]	3.2			
VOC[5]	3.7			
VOC[6]	7.5			
CO (100% load)	13.0			see Part VI.D
CO (50-99% load)	52.0			

[1] - 50-74% load, all ambient temperatures
[2] - 75-99% load, all ambient temperatures
[3] - 100% load, ambient temperature up to 60°F
[4] - 100% load, ambient temperature 61-70°F
[5] - 100% load, ambient temperature 71-80°F
[6] - 100% load, ambient temperature 81°F and above

C. No. 2 Oil Fired (Turbine #1 only)

Criteria Pollutants	lb/hr	lb/MM BTU	ppmvd	TPY
TSP	83.0	0.0392		29.9
PM-10	83.0	0.0392		29.9
SOx	108.0	0.0515		38.9
NOx	47.0	0.0229	5.9	16.9
VOC[1]	see footnote 1			see Part VI.D
VOC[2]	see footnote 2			
CO	20.6	0.0099		see Part VI.D

[1] - 75-100% load ambient temperature 0-59°F. Linear interpolation between 17.2 pph (0°F) and 15.7 pph (59°F).
[2] - 75-100% load ambient temperature 60-104°F. Linear interpolation between 15.7 pph (60°F) and 14.3 pph (104°F).

D. Total Emissions (Turbine #1 only)

Criteria Pollutants	TPY
TSP	103.45
PM-10	103.45
SOx	55.0
NOx	69.2
VOC	24.0
CO[1]	212.0

[1] - 50% load, firing gas 8760 hr

PART VI. ALLOWABLE EMISSION LIMITS, continued

E. Total Emissions (Turbine #1 and Turbine #2 combined)

Criteria Pollutants	TPY
TSP	206.9
PM-10	206.9
SOx	109.9
NOx	138.4
VOC	48.0
CO[1]	267.2

[1] - 1 turbine @ 50% load, firing gas 8760 hr, 1 turbine @ 100% load, firing oil 700 hr and gas 8040 hr

F. Hazardous Air Pollutant Emissions

The following stack concentrations of non-criteria pollutants are considered representative of typical operating conditions and may vary up to but not exceed the MASC values as calculated in RCSA §22a-174-29.

Non-Criteria Pollutants	ASC * ($\mu g/m^3$)	ppmv	TPY
Natural Gas Fired			
Non-metallic			
Sulfuric Acid [1]	156.00		
Ammonia[3]	7185.3	10.0	
Formaldehyde[3]	186.87		9.9[4]

Non-Criteria Pollutants	ASC * ($\mu g/m^3$)	ppmv	TPY
No. 2 Oil Fired			
Metallic			
Arsenic[2]	0.28		
Beryllium[2]	0.23		
Cadmium[2]	0.28		
Chromium[2]	0.83		
Copper[2]	0.83		
Lead[2]	2.76		
Mercury[2]	0.28		
Nickel[2]	2.76		
Non-metallic			
Sulfuric Acid[1,2]	459.31		
Ammonia[3]	7184.30	10.0	
Formaldehyde[3]	44.96		9.9[4]

* allowable stack concentrations.

Demonstration of compliance with the above emission limits shall be met by calculating the emission rates using emission factors from the following sources:

1. 11/27/87 CTDEP Memo, Emissions Factor Calculations for H_2SO_4, Fuel Burning Sources, David Nash
2. Fuel oil analysis
3. Manufacturer's data
4. This is a premises-wide emission limit for formaldehyde.

PART VI. ALLOWABLE EMISSION LIMITS, continued

The above statement shall not preclude the commissioner from requiring other means (e.g. stack testing) to demonstrate compliance with the above emission limits, as allowed by state or federal statute, law or regulation.

PART VII. STACK EMISSION TEST REQUIREMENTS (Applicable if -X- Checked)

Stack testing shall be performed in accordance with the latest Emission Test Guidelines available on the DEEP website:

http://www.ct.gov/dep/cwp/view.asp?a=2684&q=322076&depNav_GID=1619

Stack emission testing shall be required for the following pollutant(s):

☐ None at this time

☒ TSP ☒ SOx ☒ NOx ☒ CO

☒ VOC ☒ PM-10 ☒ Pb

☒ Non-criteria pollutants listed in PART V.

Stack testing when firing natural gas shall be performed once every five years from the date of the last stack test firing natural gas and stack testing while firing fuel oil shall be performed at least once every five years from the date of the last stack test firing fuel oil or before 700 hours of operation on fuel oil, whichever is longer, for all pollutants listed above with the following exceptions:

- After the initial stack test, stack testing shall not be required for SO_x or for pollutants requiring CEMs (NO_x, CO, and NH_3). The commissioner retains the right to require stack testing of any pollutant at any time to demonstrate compliance.
- Metals analysis of the No. 2 fuel oil may substitute for stack testing for metallic HAPs while firing oil.
- Determination of the sulfur content of the natural gas may substitute for stack testing for sulfuric acid and SO_x while firing natural gas.

PART VIII. APPLICABLE REGULATORY REFERENCES

RCSA §§22a-174-3a; 22a-174-18; 22a-174-19; 22a-174-29(b); 22a-174-22

These references are not intended to be all-inclusive. Other sections of the Regulations may apply.

PART IX. SPECIAL REQUIREMENTS

A. The Permittee shall operate and maintain this equipment in accordance with the manufacturer's specifications and written recommendations.

B. *Noise (for non-emergency use)*

The Permittee shall operate this facility at all times in a manner so as not to violate or contribute significantly to the violation of any applicable state noise control regulations, as set forth in RCSA §§ 22a-69-1 through 22a-69-7.4.

C. The Permittee shall comply with all applicable sections of the following New Source Performance Standard(s) at all times. (Applicable if -X- checked)

40 CFR Part 60, Subpart: ☐ Db ☐ Dc ☒ GG ☒ A

☐ None

PART IX. SPECIAL REQUIREMENTS, continued

D. The Permittee secured external emission offsets to comply with RCSA §22a-174-3a(l). The offsets were required for NO_x emissions at a rate of 1.2 to 1. The turbines (Permit Nos. 105-0068, 0069) are permitted for 138.4 tpy NO_x total, therefore, 166.1 tons of NO_x offsets were secured, approved and made federally enforceable prior to issuance of the construction permit. These emission offsets were in effect prior to commencement of operation.

PART X. ADDITIONAL TERMS AND CONDITIONS

A. This permit does not relieve the Permittee of the responsibility to conduct, maintain and operate the regulated activity in compliance with all applicable requirements of any federal, municipal or other state agency. Nothing in this permit shall relieve the Permittee of other obligations under applicable federal, state and local law.

B. Any representative of the DEEP may enter the Permittee's site in accordance with constitutional limitations at all reasonable times without prior notice, for the purposes of inspecting, monitoring and enforcing the terms and conditions of this permit and applicable state law.

C. This permit may be revoked, suspended, modified or transferred in accordance with applicable law.

D. This permit is subject to and in no way derogates from any present or future property rights or other rights or powers of the State of Connecticut and conveys no property rights in real estate or material, nor any exclusive privileges, and is further subject to any and all public and private rights and to any federal, state or local laws or regulations pertinent to the facility or regulated activity affected thereby. This permit shall neither create nor affect any rights of persons or municipalities who are not parties to this permit.

E. Any document, including any notice, which is required to be submitted to the commissioner under this permit shall be signed by a duly authorized representative of the Permittee and by the person who is responsible for actually preparing such document, each of whom shall certify in writing as follows: "I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that any false statement made in the submitted information may be punishable as a criminal offense under section 22a-175 of the Connecticut General Statutes, under section 53a-157b of the Connecticut General Statutes, and in accordance with any applicable statute."

F. Nothing in this permit shall affect the commissioner's authority to institute any proceeding or take any other action to prevent or abate violations of law, prevent or abate pollution, recover costs and natural resource damages, and to impose penalties for violations of law, including but not limited to violations of this or any other permit issued to the Permittee by the commissioner.

G. Within fifteen days of the date the Permittee becomes aware of a change in any information submitted to the commissioner under this permit, or that any such information was inaccurate or misleading or that any relevant information was omitted, the Permittee shall submit the correct or omitted information to the commissioner.

H. The date of submission to the commissioner of any document required by this permit shall be the date such document is received by the commissioner. The date of any notice by the commissioner under this permit, including but not limited to notice of approval or disapproval of any document or other action, shall be the date such notice is personally delivered or the date three days after it is mailed by the commissioner, whichever is earlier. Except as otherwise specified in this permit, the word "day" means calendar day. Any document or action which is required by this permit to be submitted or performed by a date which falls on a Saturday, Sunday or legal holiday shall be submitted or performed by the next business day thereafter.

I. Any document required to be submitted to the commissioner under this permit shall, unless otherwise specified in writing by the commissioner, be directed to: Office of Director; Engineering & Enforcement Division; Bureau of Air Management; Department of Energy & Environmental Protection; 79 Elm Street, 5th Floor; Hartford, Connecticut 06106-5127.

APPENDIX A
Control Equipment Specifications

Air Pollution Control Equipment (applicable if -X- checked).

The Permittee shall comply with the procedures for malfunction of control equipment as specified in Section 7 of the Regulations.

The following specifications need not be verified on a continuous basis, however, if requested by the Bureau, demonstration shall be shown.

☐ None

☐ Scrubber

Make and Model:_____
Reagent:_____
Reagent Flow Rate:_____
Pressure Drop (in H_2O):_____
Minimum Gas Flow Rate at Maximum Rated Capacity (acfm):_____
PH:_____
Design Outlet Grain Loading (gr/dscf):_____
Design Removal Efficiency (%):_____

☐ Electrostatic Precipitator (ESP)

Make and Model:_____
Number of Fields:_____
Minimum Gas Flow Rate at Maximum Rated Capacity (acfm):_____
Design Outlet Grain Loading (gr/dscf):_____
Design Removal Efficiency (%):_____

☐ Cyclone ☐ Multicyclone

Make and Model:_____
Pressure Drop (in H_2O):_____
Minimum Gas Flow Rate at Maximum Rated Capacity (acfm):_____

☐ Selective Non-catalytic Reduction (SNCR)

☐ Urea ☐ Ammonia

Make and Model:_____
Injection Rate at Maximum Rated Capacity (lb/hr):_____
Operating Temperature Range (EF):_____
Minimum Gas Flow Rate at Maximum Rated Capacity (acfm):_____
Design Removal Efficiency (%):_____

☒ Selective Catalytic Reduction (SCR)

Make and Model: MHI or equivalent
Catalyst Type: Honeycomb
Minimum Gas Flow Rate at Maximum Rated Capacity (acfm): 2,271,500
Pressure Drop (in H_2O): 3
Ammonia Injection Rate at Maximum Rated Capacity (lb/hr): 676
Design Removal Efficiency (%): 2 ppmvd @ 15% O_2 (gas), 5.9 ppmvd @ 15% O_2 (oil)

APPENDIX A
Control Equipment Specifications, continued

☒ Low NOx Burner

Make and Model: ABB GT-24 ACS with EV and SEV combustors
Guaranteed NOx Emission Rate (lb/MM BTU): 0.09 lb/MMBtu
Design Removal Efficiency (%): Reduce NOx below 25 ppmvd @ 15% O2

☐ Particulate Trap

Make and Model:
Design Removal Efficiency (%):

☐ Fabric Filter

Make and Model:
Number of Bags in Use:
Air/Cloth Ratio:
Bag Material:
Cleaning Method:
Pressure Drop (in H_2O):
Minimum Gas Flow Rate at Maximum Rated Capacity (acfm):
Design Outlet Grain Loading (gr/dscf):
Design Removal Efficiency (%):

☒ Other: CO Oxidation Catalyst

Make and Model: Engelhard or equivalent
Type: Metal substrate catalytic oxidation system
Pressure Drop: At design point it is 0.7 in. H2O
Design removal efficiency: 76%