

Newington Energy, LLC
Newington, NH

Application # FY04-0002 & FY04-0157
Last Updated: 11/29/2006
Updated by: G. Milbury

Permit Modification Request

Applicant Requests increase in allowable annual fuel usage of low sulfur distillate oil.
Requesting increase from 19,850,000 gallons to 33,120,000 gallons.
Equivalent to increase from 720 hr/yr to 1,200 hr/yr at full load for each turbine.

Gross Heat Input Rates:	1,751	MMBTU/hr (LHV) - gas
	2,115	MMBTU/hr (HHV) - gas
	1,932	MMBTU/hr (LHV) - oil
	2,218	MMBTU/hr (HHV) - oil

Previous Limit (based on 30 days/yr per turbine):	720
Proposed Limit (based on 50 days/yr for each turbine):	1200

Emission Calculations

Pollutant	Fuel Type	BACT Limits	Current Permit Limits for Each Turbine (lb/hr)	Proposed Permit Limits for Each Turbine (lb/hr)	Proposed Permit Limits (Turbines Only) - Based on 50 Days Oil Firing Per Turbine (tpy)	Existing Facility-Wide Permit Limits (tpy)	Proposed Facility-Wide Permit Limits (tpy)	Net Change in Emissions (tpy)	PSD/Nonattainment Significant Modification Threshold (tpy)	Significant Increase Threshold Exceeded (Y/N)
NOx	Nat. Gas	2.5 ppmvd @ 15% O2	17.28	19.48	130.6	204.9	223.8	18.9	25	N
	Oil	9.0 ppmvd @ 15% O2	74.25	77.60	93.1					
SO2	Nat. Gas	0.0036 lb/MMBtu	6.3	6.3	47.6	125.4	55.2	-70.2	40	N
	Oil	0.0015 lb/MMBtu	97.6	3.33	4.0					
CO	Nat. Gas	15.0 ppmvd @ 15% O2	53	71.16	538.0	484.8	526.7	41.9	100	N
	Oil	20.0 ppmvd @ 15% O2	75	104.98	126.0					
PM-10	Nat. Gas	0.015 lb/MMBtu	11	11.00	83.2	104.8	107.2	2.4	15	N
	Oil	0.040 lb/MMBtu	20	20.00	24.0					
VOC	Nat. Gas	0.0020 lb/MMBtu	3.75	4.23	32.0	36.3	38.5	2.2	25	N
	Oil	0.0038 lb/MMBtu	7.5	8.43	10.1					
NH3	Nat. Gas	10.0 ppmvd @ 15% O2	28	28.84	218.1	247.6	250.0	2.4	N/A	N/A
	Oil	10.0 ppmvd @ 15% O2	30.5	31.91	38.3					
H2SO4	Nat. Gas	0.00083 lb/MMBtu	1.4	0.92	6.9	20.9	11.2	-9.7	7	N
	Oil	0.0116 lb/MMBtu	22.35	0.5	0.6					

1. Assumes 8,760 hr/yr on natural gas for SO2 emissions since this rate will be higher on gas than on 0.0015% sulfur distillate fuel oil.

Notes:

* Includes emissions from auxiliary boiler, eight fuel gas heaters, emergency generator, emergency fire pump, and space heaters.

** Changes in emissions are solely due to the replacement of the original eight fuel gas heaters with six new fuel gas heaters.

 ==> Changes in hourly emission rates are highlighted.

 ==> Change in emission rate due to switch to ultra low sulfur (15 ppm) fuel oil.

Example Calculations:

$$\frac{\text{lb/MMBtu ppmvd @ 15\% O}_2}{1,000,000} \times \frac{20.9}{20.9-15} \times \frac{\text{MW (lb/lb-mole)} \times \text{Fd}}{385.3 \text{ (SCF/lb-mol)} \times \text{MMBtu}} \text{ SCF} \text{ MMBtu} \text{ } \text{====> Fd = } \begin{matrix} 8,710 \text{ SCF/MMBtu for natural gas} \\ 9,190 \text{ SCF/MMBtu for fuel oil.} \end{matrix}$$

$$\frac{\text{lb/hr}}{\text{MMBtu}} \times \text{Max Heat Input} \times \frac{\text{MMBtu}}{\text{hr}} \text{ } \text{====> MW NOx = 4} \quad 46.01 \text{ lb/lb-mole}$$

$$\text{====> MW CO = 2} \quad 28.01 \text{ lb/lb-mole}$$

$$\text{====> MW NH}_3 = 1 \quad 17.03 \text{ lb/lb-mole}$$

PTE (tpy) [Current Gas Firing limit (lb/hr) x 7,560 (hr/yr) + Proposed Oil Firing Limit (lb/hr) x 1,200 (hr/yr)] x 1 ton x 2 turbines

Annual Oil Firing Limit $2,218 \frac{\text{MMBtu}}{\text{hr}} \times \frac{50 \text{ days}}{\text{yr}} \times \frac{24 \text{ hours}}{\text{day}} \times 2 \text{ turbines}$