THE CITY OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Environmental Compliance
59-17 Junction Boulevard, 9th Floor, Flushing, New York 11373
Records Control 718.595.3855

Rev 06/2014

Emily Lloyd
Commissioner

Michael Gilsenan
Assistant Commissioner
Environmental Compliance

SAMPLE CALCULATION SHEET
FOR No. 6 FUEL OIL AND NATURAL GAS COMBUSTION
(EQUIVALENT TO No. 4 FUEL OIL)

#6 Fuel Oil Delivery Records				Natural Gas Bills			
(gal)				(scf)			
Year	2009	2010	2011	Year	2009	2010	2011
March	8,500	7,900	8,100	March	1,250,000	1,100,000	1,300,000
May	5,100	5,700	5,500	May	718,000	708,000	968,000
November	8,300	8,200	7,500	November	1,150,000	1,350,000	1,000,000

Line 1: **Calculate the gallons of #6 fuel oil burned on an average of 3 years.**
Year 2009 = 8,500 + 5,100 + 8,300 = 21,900 gal/yr
Year 2010 = 7,900 + 5,700 + 8,200 = 21,800 gal/yr
Year 2011 = 8,100 + 5,500 + 7,500 = 21,100 gal/yr
21,900 + 21,800 + 21,100 = 64,800 / 3 = **21,600** gal/yr

Line 2: **Calculate the annual heat input from #6 fuel oil (in MMBtu/yr).**
Heating value for #6 fuel oil is 150,000 Btu/gal **or** 0.15 MMBtu/gal.
21,600 X 0.15 = **3,240** MMBtu/yr

Line 3: **Calculate number of cubic feet of natural gas burned on an average of 3 years.**
Year 2009 = 1,250,000 + 718,000 + 1,150,000 = 3,118,000 scf/yr
Year 2010 = 1,100,000 + 708,000 + 1,350,000 = 3,158,000 scf/yr
Year 2011 = 1,300,000 + 968,000 + 1,000,000 = 3,268,000 scf/yr
3,118,000 + 3,158,000 + 3,268,000 = 9,544,000 / 3 = 3,181,333 scf/yr

Line 4: **Calculate the annual heat input from natural gas (in MMBtu/yr).**
Heating value for natural gas is 1020 Btu/scf **or** 0.00102 MMBtu/scf.
3,181,333 X 0.00102 = **3,245** MMBtu/yr

Line 5: **Determine the total annual heat input** by adding the annual heat input from #6 fuel oil and the annual heat input from natural gas. Add results from Line 2 and Line 4.
3,240 + 3,245 = 6,485 MMBtu/yr

Line 6: **Determine the allowable gallons of #6 fuel oil burned per year.**
The factor of 3.7 is calculated based on emissions factors from AP-42 and using a proportion of 55% #6 oil and 45% natural gas equivalent to #4 oil.
6,485 X 3.7 = 23,995 gal/yr

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CALCULATION WORKSHEET:

LINE		VALUE	MEASUREMENT
1	Average Gallons of #6 Fuel Oil burned per year[1]	21,600	gal/yr
2	Annual heat input from #6 Fuel Oil (Multiply line 1 by 0.15[2])	3,240	MMBtu/yr
3	Average Cubic Feet of Natural Gas burned per year[3]	3,181,333	scf/yr
4	Annual heat input from Natural Gas (Multiply line 3 by 0.00102[4])	3,245	MMBtu/yr
5	Total annual heat input (Add lines 2 and 4)	6,485	MMBtu/yr
6	Allowable gallons of #6 Fuel Oil burned per year (Multiply line 5 by 3.7[5])	23,995	gal/yr

MAXIMUM ALLOWABLE GALLONS OF #6 FUEL OIL BURNED PER YEAR WILL BE THE <u>LOWER VALUE</u> BETWEEN LINE 1 AND LINE 6 OF THE ABOVE WORKSHEET. IF THIS VALUE IS EXCEEDED, PENALTIES WILL BE IMPOSED.

MAXIMUM ALLOWABLE GALLONS OF #6 FUEL OIL BURNED PER YEAR
____21,600____ GAL/YR

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[1] Average of the past 3 years of # 6 Fuel oil consumption.
[2] The heating value for #6 fuel oil is 0.15 million Btu/gal.
[3] Average of the past 3 years of natural gas consumption.
[4] The heating value for natural gas is 0.00102 million Btu/scf.
[5] The factor of 3.7 is calculated based on US EPA AP-42 emissions factors.