Public Service of New Hampshire
A Northeast Utilities Company

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William H. Smagula, P.E.
Vice President - Generation

D32691

December 18, 2013

Mr. Craig A. Wright, ~~Acting Director~~
Air Resources Division
NH Department of Environmental Services
29 Hazen Drive, PO Box 95
Concord, NH 03302-0095

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Public Service Company of New Hampshire
Schiller Station Facility ID#3301500012: Application #11-0134
Permit Application Request for Additional Information (2)

Dear Mr. Wright:

Public Service Company of New Hampshire (PSNH) is providing the following information in response to Air Resources Division's letter dated December 6, 2013, requesting additional information to support the Division's final decision relative to the Schiller Station's Title V Operating Permit Renewal Application. In response to the Division's request, PSNH is providing the following documents as attachments to this submittal.

1. *DES requests that PSNH provide the following $PM_{2.5}$ emission data for each significant and insignificant activity at Schiller Station:*
    a. *The potential and actual emissions in pound per hour;*
    b. *The potential and actual emissions in tons per year; and,*
    c. *The method, including example calculations and emission factors, used to determine the emissions.*

Schiller's emission inventory has been updated to include $PM_{2.5}$ emissions for each significant and insignificant activity located at the Station. The updated emissions inventory is found in Attachment 1.

2. *DES requests that PSNH submit an updated CAM plan that includes preventative maintenance procedures for the two ESPs.*

Attachment 2 contains an updated CAM plan that includes preventative maintenance procedures as an additional indicator for the two ESPs.

Should you have any questions, please contact Sheila A. Burke, Senior Compliance Consultant – Generation at (603) 634-2512 or sheila.burke@nu.com.

I am authorized to make this submittal on behalf of the facility for which the submission is made. Based on information and belief formed after reasonable inquiry, I certify that the statements and information in the enclosed documents are to the best of my knowledge and belief true, accurate and complete. I am aware that there are significant penalties for submitting false statements and information or omitting required statements and information, including the possibility of fine or imprisonment.

Sincerely,

William H. Smagula, P.E.
Vice President – Generation

Enclosures

Cc: Gary D. Millbury, NHARD (via email)
Padmaja Baru, NHARD (via email)
Todd Moore, NHARD (via email)

ATTACHMENT 1

TABLE 3
CRITERIA POLLUTANT INVENTORY

Public Service Company of New Hampshire
Schiller Station
Portsmouth, New Hampshire

Pollutant	SR4 (biomass)		SR6 (biomass)		SR4 (coal)		SR6 (coal)		SR4 (oil)		SR6 (oil)		SR5 (Wood)	
	Actual Emissions (tons/yr)	Potential Emissions (tons/yr)	Actual Emissions (tons/yr)	Potential Emissions (tons/yr)	Actual Emissions (tons/yr)	Potential Emissions (tons/yr)	Actual Emissions (tons/yr)	Potential Emissions (tons/yr)	Actual Emissions (tons/yr)	Potential Emissions (tons/yr)	Actual Emissions (tons/yr)	Potential Emissions (tons/yr)	Actual Emissions (tons/yr)	Potential Emissions (tons/yr)
Fuel Use	180 tons	19,719 tons	180 tons	19,719 tons	114,928 tons	197,188 tons	108,321 tons	197,188 tons	300,594 gal	33,579,971 gal	69,552 gal	33,579,971 gal	524,703 tons	670,140 tons
SO_2	0.03	3.70	0.03	3.70	1622.60	6033.89	1602.64	6033.89	23.60	5272.06	5.46	5272.06	1.70	63.07
NO_x	0.30	32.54	0.30	32.54	409.69	1156.50	408.20	1156.50	6.01	1158.51	1.39	1158.51	165.80	236.5
PM	0.07	7.99	0.07	7.99	28.38	251.41	6.15	251.41	0.015	251.85	0.003	251.85	2.65	31.50
PM_{10}	0.05	5.92	0.05	5.92	19.02	168.45	4.12	168.45	0.009	158.67	0.002	158.67	1.96	23.31
$PM_{2.5}$	0.05	5.03	0.05	5.03	8.23	72.91	1.78	72.91	0.006	103.26	0.001	103.26	1.72	20.48
Condensible PM	0.02	2.51	0.02	2.51	48.13	341.29	45.36	341.29	0.23	25.18	0.05	25.18	45.08	53.61
CO	0.81	88.73	0.81	88.73	28.73	49.30	27.08	49.30	0.75	83.95	0.17	83.95	7.96	315.4
VOC	0.023	2.51	0.023	2.51	3.45	6.17	3.25	6.17	0.11	12.76	0.03	12.76	13.26	15.80

Fuel Type	Emission Factors									
	SO_2	NO_x	CO	VOC	PM	PM10	PM2.5	Condensible PM	Heat Content	AP-42 Citations
Boilers										
Biomass	0.025 (lb/mmbtu)	0.22 (lb/mmbtu)	0.6 (lb/mmbtu)	0.017 (lb/mmbtu)	0.054 (lb/mmbtu)	0.04 (lb/mmbtu)	0.034 (lb/mmbtu)	0.017 (lb/mmbtu)	15 mmbtu/ton	Table 1.6-1 and 1.6-3
Coal	Site Data	Site Data	0.5 lb/ton	0.06 lb/ton	See Note 5	67% PM	29% PM	0.1S-0.03 (lb/mmbtu)	25.5 mmbtu/ton	Tables 1.1-5, 1.1-6, 1.1-19, and onsite data
Oil	157S lb/1,000 gal	40 lb/1000 gal	5 lb/1000 gal	0.76 lb/1000 gal	0.1 lb/1,000 gal	63% PM	41% PM	1.5 lb/1,000 gal	153.8 mmbtu/1,000 gal	Tables 1.3-1, 1.3-2, 1.3-4 and onsite data
Wood	0.025 (lb/mmbtu)	0.22 (lb/mmbtu)	0.003 (lb/mmbtu)	0.005 (lb/mmbtu)	See Note 2	74% PM	65% PM	0.017 lb/mmbtu	5,054 BTU/lb	Tables 1.6-1, 1.6-3 and onsite data
Gas	0.6 lb/mmscf	140 lb/mmscf	84 lb/mmscf	5.5 lb/mmscf	1.9 lb/mmscf	1.9 lb/mmscf	1.9 lb/mmscf	5.7 lb/mmscf	N/A	Tables 1.4-1 and 1.4-2
Turbines										
#1 Fuel Oil	1.01S (lb/mmbtu)	0.9 lb/mmbtu	0.11 lb/mmbtu	0.00041 lb/mmbtu	0.0043 lb/mmbtu	100% PM	100% PM	0.0072 lb/mmbtu	133,853 btu/gal	Table 3.1-2a and NH AP-42 Table
Gas	0.0034 (lb/mmbtu)	0.9 lb/mmbtu	0.082 lb/mmbtu	0.0021 lb/mmbtu	0.0019 lb/mmbtu	0.0019 lb/mmbtu	0.0019 lb/mmbtu	0.0047 lb/mmbtu	1,020 btu/scf	Table 3.1-2a
Emergency Generator										
Gas	5.88E-04 lb/mmbtu	0.847 lb/mmbtu	0.557 lb/mmbtu	0.118 lb/mmbtu	7.71E-05 lb/mmbtu	7.71E-05 lb/mmbtu	7.71E-05 lb/mmbtu	9.91E-03 lb/mmbtu	1,020 btu/scf	Table 3.3-2

Notes:

1. S for oil is defined as the percent sulfur of the fuel. The sulfur content of the fuel was 1%, therefore 1 was used as S in the calculations.
2. Actual emissions are based on 2010 fuel usage.
3. Actual emissions of NOx and SO2 from SR4, SR5 and SR6 are based on continuous monitoring data. Emissions of VOC and CO from SR4, SR5 and SR6 were estimated based on AP42 emission factors.
4. Natural Gas is used for boiler ignition and is not a primary fuel for SR4, SR5, and SR6. Emissions for Natural Gas in SR5 are based on the permit limit of 1,261 mmcf and AP42 emission factors.
5. Actual PM emissions for SR4 (coal), SR5 (wood) and SR6 (coal) are based on unit specific emission factors derived from stack testing as reported to NHDES, and 12,348 BTU/pound of coal.
   SR4 (actual coal) = 0.02 lb PM / MMBTU, SR5 (actual wood) = 0.001 lb PM/MMBTU, SR6 (actual coal) = 0.0046 lb PM/MMBTU
6. The ESP Efficiency of 99.2% for SR4 and SR6 was derived from stack testing data.
7. Potential PM emissions for SR4, SR5 and SR6 are based on permit limitations.
8. PM, PM10 and PM2.5 emissions represent the filterable fraction for each particle size range. Condensible particulate is listed separately in the table.
9. Actual condensible particulate matter emissions for coal combustion in SR4 and SR6 were estimated based upon an average coal sulfur content of 0.64 percent by weight and 12,348 BTU per pound of coal.
10. Potential condensible particulate matter emissions for coal combustion in SR4 and SR6 were based upon an average coal sulfur content of 1.3 pounds of sulfur/MMBTU and 12,750 BTU per pound of coal.
11. Potential condensible particulate matter emissions for coal combustion in SR5 was based upon an average coal sulfur content of 1.0 pounds of sulfur/MMBTU and 12,750 BTU per pound of coal.
12. Potential condensible particulate matter emissions for wood combustion in SR5 was based upon the heat rating of 720 MMBTU/hr and 8760 hours per year.
13. An estimated heat content of 7500 BTU per pound (15 mmBTU/ton) was used for dry biomass combustion in SR4 and SR6.
14. The annual average heat content of wood combusted in SR5 was 5,054 BTU per pound.
15. The potential heat rating of both SR4 and SR6 is 575 MMBtu/hr for oil and 574 MMBtu/hr for coal.

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TABLE 3
CRITERIA POLLUTANT INVENTORY

Public Service Company of New Hampshire
Schiller Station
Portsmouth, New Hampshire

Pollutant	SR5 (Coal)		SR4 (Gas)		SR5 (Gas)		SR6 (Gas)		Combustion Turbine (#1 oil: JP-4)		Combustion Turbine (gas)		Emergency Generator (gas)		Totals	
	Actual Emissions (tons/yr)	Potential Emissions (tons/yr)	Actual Emissions (tons/yr)	Potential Emissions-4 (tons/yr)	Actual Emissions (tons/yr)	Potential Emissions3 (tons/yr)	Actual Emissions (tons/yr)	Potential Emissions-4 (tons/yr)	Actual Emissions (tons/yr)	Potential Emissions (tons/yr)	Actual Emissions (tons/yr)	Potential Emissions (tons/yr)	Actual Emissions (tons/yr)	Potential Emissions (tons/yr)	Actual Emissions (tons/yr)	Potential Emissions (tons/yr)
Fuel Use	0 tons	204,108 tons	0.13 MMscf	0 MMscf	5.76 MMscf	1,261 MMscf	0.18 MMscf	0 MMscf	56,967 gal	13,900,000 gal	0.00 MMscf	2.540 MMscf	0.06 MMscf	0.75 MMscf		
SO_2	-	333.80	0.00004	-	0.002	0.38	0.00006	-	0.19	46.98	-	4.40	0.00002	0.0002	3256.26	12448.56
NO_x	-	236.5	0.009	-	0.40	88.27	0.01	-	3.43	837.25	-	1143.18	0.03	0.32	995.56	3697.02
PM	-	31.50	0.0001	-	0.01	1.20	0.0002	-	0.02	4.00	-	2.41	0.0000024	0.23	37.37	539.43
PM_{10}	-	21.11	0.0001	-	0.01	1.20	0.0002	-	0.02	4.00	-	2.41	0.0000024	0.23	25.24	364.43
$PM_{2.5}$	-	9.14	0.0001	-	0.01	1.20	0.0002	-	0.02	4.00	-	2.41	0.0000024	0.23	11.86	231.22
Condensible PM	-	269.79	0.0004	-	0.02	3.59	0.0005	-	0.03	6.79	-	6.09	0.000313	0.0038	138.94	959.07
CO	-	315.4	0.005	-	0.24	52.96	0.008	-	0.42	102.33	-	106.22	0.02	0.21	67.00	599.31
VOC	-	15.80	0.0003	-	0.02	3.47	0.0005	-	0.002	0.38	-	2.72	0.004	0.05	20.17	44.09

SUPPORTING CALCULATIONS
TOTAL FACILITY EMISSIONS FOR ARD-1
Public Service Company of New Hampshire
Schiller Station
Portsmouth, New Hampshire

POTENTIAL EMISSIONS

Pollutant	SR4	SR5	SR6	SRCT	SREG	Total
Hourly (lb/hr)						
SO_2	1,377.6	76.2	1,377.6	17.4	0.001	2,848.8
NO_X	287.5	54.0	287.5	261.0	1.3	891.3
CO	20.3	72.0	65.1	31.9	0.8	190.1
PM	57.5	7.2	57.5	29.0	0.9	152.1
$PM_{2.5}$	23.6	4.7	23.6	8.4	0.9	61.1
CPM	119.9	92.4	119.9	2.8	0.01	335.0
VOC	2.9	3.6	2.9	0.0	0.2	9.6
Annual (tons/yr)						
SO_2	6,033.9	333.8	6,033.9	47.0	0.0	12,448.5
NO_X	1,158.5	236.5	1,158.5	1,143.2	0.3	3,697.0
CO	88.7	315.4	88.7	106.2	0.2	599.3
PM	251.9	31.5	251.9	4.0	0.2	539.4
$PM_{2.5}$	103.3	20.5	103.3	4.0	0.2	231.2
CPM	341.3	269.8	341.3	6.7	0.004	959.1
VOC	12.8	15.8	12.8	2.7	0.0	44.1

2010 ACTUAL EMISSIONS

Pollutant	SR4	SR5	SR6	SRCT	SREG	Total
Op. Hours	7213	7811	6892.25	72.27	27.38	-
Hourly (lb/hr)						
SO_2	456.5	0.4	466.6	5.3	0.016	928.9
NO_X	115.3	42.6	118.9	95.0	23.7	395.3
CO	8.4	2.1	8.1	11.6	1.3	31.5
PM	7.9	0.7	1.8	0.5	16.4	27.3
$PM_{2.5}$	2.3	0.4	0.5	0.5	0.00018	3.7
CPM	13.4	11.5	13.2	0.8	0.023	38.9
VOC	1.0	3.4	1.0	0.043	3.3	8.7
ANNUAL (tons)						
SO_2	1,646.2	1.7	1,608.1	0.2	0.0002	3,256.2
NO_X	415.7	166.2	409.6	3.4	0.3	995.3
CO	30.3	8.2	28.1	0.4	0.0	67.0
PM	28.5	2.7	6.2	0.02	0.2	37.6
$PM_{2.5}$	8.3	1.7	1.8	0.02	0.000002	11.9
CPM	48.4	45.1	45.4	0.03	0.0003	138.9
VOC	3.6	13.3	3.4	0.002	0.05	20.3

Notes:
1. Potential emissions for SR5 are from Temporary Permit TP-0085, reissued March 7, 2006, Table 5.
2. Potential emissions of PM, SO_2 and NO_X for SR4 and SR6 are from Title V Operating Permit TV-OP-053, March 9, 2007, Table 6.
3. Potential emissions of CO and VOC based on AP-42 emission factors (see supporting calculations).
4. Average hourly emissions based on actual annual emissions divided by operating hours.
5. Insignificant activity emissions are separately documented in the insignificant activity inventory information.
6. Potential hourly CPM emissions are based on maximum allowable coal sulfur content for each unit.

SUPPORTING CALCULATIONS
PM2.5 SAMPLE CALCULATIONS
Public Service Company of New Hampshire
Schiller Station
Portsmouth, New Hampshire

SR4 PM2.5 Potential Emissions - Biomass

$PM_{2.5}$ (lb/hr)	=	$PM_{2.5}$ Emission Factor (lb/MMBTU)	x	Biomass Cofiring (%)	x	Max Coal Combustion	x	Biomass Heat Content
1.15 lb/hr	=	0.034 lb/MMBTU	x	10%	x	22.5 tons/hr	x	15.0 MMBTU/ton
$PM_{2.5}$ (tons/yr)	=	$PM_{2.5}$ (lb/hr)	x	8,760 hours/yr	÷	2,000 lbs/ton		
5.03 tons/yr	=	1.15 lb/hr	x	8,760 hours/yr	÷	2,000 lbs/ton		

SR4 PM2.5 Potential Emissions - Coal

$PM_{2.5}$ (lb/hr)	=	PM Emission Limit (lb/MMBTU)	x	$PM_{2.5}$ Fraction (%)	x	Boiler Heat Input (MMBTU/hr)
16.68 lb/hr	=	0.10 lb/MMBTU	x	29%	x	575 MMBTU/hr
$PM_{2.5}$ (tons/yr)	=	$PM_{2.5}$ (lb/hr)	x	8,760 hours/yr	÷	2,000 lbs/ton
73.04 tons/yr	=	16.68 lb/hr	x	8,760 hours/yr	÷	2,000 lbs/ton

SR4 PM2.5 Potential Emissions - Oil

$PM_{2.5}$ (lb/hr)	=	PM Emission Limit (lb/MMBTU)	x	$PM_{2.5}$ Fraction (%)	x	Boiler Heat Input (MMBTU/hr)
23.58 lb/hr	=	0.10 lb/MMBTU	x	41%	x	575 MMBTU/hr
$PM_{2.5}$ (tons/yr)	=	$PM_{2.5}$ (lb/hr)	x	8,760 hours/yr	÷	2,000 lbs/ton
103.26 tons/yr	=	23.58 lb/hr	x	8,760 hours/yr	÷	2,000 lbs/ton

SR4 PM2.5 Actual Emissions - Biomass

$PM_{2.5}$ (lb/year)	=	$PM_{2.5}$ Emission Factor (lb/MMBTU)	x	Biomass Cofiring (tons/yr)	x	Biomass Heat Content (MMBTU/ton)
91.80 lb/yr	=	0.034 lb/MMBTU	x	180 tons	x	15.0 mmbtu/ton
$PM_{2.5}$ (lb/hr)	=	$PM_{2.5}$ (lb/yr)	÷	operating hours/yr		
0.01 lb/hr		91.80 lb/yr	÷	7,213 hours/yr		
$PM_{2.5}$ (ton/yr)	=	$PM_{2.5}$ (lb/yr)	÷	2,000 lbs/ton	÷	2,000 lbs/ton
0.05 tons/yr	=	91.80 lb/hr	÷	2,000 lbs/ton		

SUPPORTING CALCULATIONS
PM2.5 SAMPLE CALCULATIONS
Public Service Company of New Hampshire
Schiller Station
Portsmouth, New Hampshire

SR4 PM2.5 Actual Emissions - Coal

$PM_{2.5}$ (tons/yr)	=	PM Emission Factor (lb/MMBTU)	x	$PM_{2.5}$ Fraction (%)	x	Coal Heat Input (MMBTU/yr)		
8.23 tons/yr	=	0.02 lb/MMBTU	x	29%	x	2,838,262 MMBTU/yr	÷	2,000 lbs/ton
$PM_{2.5}$ (lb/hr)	=	$PM_{2.5}$ (tons/yr)	x	2,000 lbs/ton	÷	operating hours/yr		
2.28 lb/hr	=	8.23 tons/yr	x	2,000 lbs/ton	÷	7,213 hours/yr		

SR4 combusted 114,928 tons of coal in 2010 with an average heat content of 12,348 BTU/lb

SR4 PM2.5 Actual Emissions - Oil

$PM_{2.5}$ (tons/yr)	=	PM Emission Factor (lb/MMBTU)	x	$PM_{2.5}$ Fraction (%)	x	Fuel Use (1000 gal/yr)	x	1 - ESP Control Efficinecy (%)
			÷	2,000 lbs/ton				
0.006 tons/yr	=	12.41 lb/1000 gal	x	41%	x	300.594 Mgal/yr	x	0.8%
			÷	2,000 lbs/ton				
$PM_{2.5}$ (lb/hr)	=	$PM_{2.5}$ (tons/yr)	x	2,000 lbs/ton	÷	operating hours/yr		
0.002 lb/hr	=	0.006 tons/yr	x	2,000 lbs/ton	÷	7,213 hours/yr		

SR4 combusted 300,595 gallons of #6 fuel oil in 2010 with an sulfur content of 1.0% by weight
ESP Control efficiency is 99.2%

AP-42 PM (lb/1000 gal)	=	9.19	x	Weight % Sulfur	+	3.22
12.41 lb/1000 gal		9.19	x	1.0	+	3.22

TABLE I
REVISED LIST OF INSIGNIFICANT ACTIVITIES

Public Service Company of New Hampshire
Schiller Station
Portsmouth, New Hampshire

Insignificant Activity	Annual Actual Emissions (lbs/yr)	Annual Actual Emissions (tons/yr)	Annual Actual Emissions (lbs/hr)	Emissions Notes
Fuel Oil Tank (NT-1) - Total Emissions	48.29	0.02	5.51E-03	Estimated Using USEPA's Tanks 4.09D model
PM_{10} Emissions	-	-	-	Negligible PM Emissions
$PM_{2.5}$ Emissions	-	-	-	Negligible PM Emissions
Fuel Oil Tank (NT-2) - Total Emissions	48.29	0.02	5.51E-03	Estimated Using USEPA's Tanks 4.09D model
PM_{10} Emissions	-	-	-	Negligible PM Emissions
$PM_{2.5}$ Emissions	-	-	-	Negligible PM Emissions
Fuel Oil Tank (SR-2) - Total Emissions	11.33	5.66E-03	1.29E-03	Estimated Using USEPA's Tanks 4.09D model
PM_{10} Emissions	-	-	-	Negligible PM Emissions
$PM_{2.5}$ Emissions	-	-	-	Negligible PM Emissions
Fuel Oil Tank (SR-3) - Total Emissions	17.33	8.66E-03	1.98E-03	Estimated Using USEPA's Tanks 4.09D model
PM_{10} Emissions	-	-	-	Negligible PM Emissions
$PM_{2.5}$ Emissions	-	-	-	Negligible PM Emissions
Boiler Chemical Cleaning - Total Emissions	818.60	0.41	0.09	Naphthalene (6.7#), acetic acid (0.8#), ethylene glycol (0.2#), metals (811.3# - ca, cr, cu, fe, mg, mn, ni, zn)
PM_{10} Emissions	-	-	-	Negligible PM Emissions
$PM_{2.5}$ Emissions	-	-	-	Negligible PM Emissions
50% Urea Storage Tanks (2) - Total Emissions	No Data	No Data	No Data	Negligible - Urea solution has low volatility
PM_{10} Emissions	-	-	-	Negligible PM Emissions
$PM_{2.5}$ Emissions	-	-	-	Negligible PM Emissions
NAOH Storage - Total Emissions	No Data	No Data	No Data	Negligible - NAOH has low volatility
PM_{10} Emissions	-	-	-	Negligible PM Emissions
$PM_{2.5}$ Emissions	-	-	-	Negligible PM Emissions
H2SO4 Storage - Total Emissions	No Data	No Data	No Data	Negligible - H2SO4 has low volatility
PM_{10} Emissions	-	-	-	Negligible PM Emissions
$PM_{2.5}$ Emissions	-	-	-	Negligible PM Emissions
Jet Fuel Tanks - Total Emissions	No Data	No Data	No Data	Negligible - Jet fuel has low volatility
PM_{10} Emissions	-	-	-	Negligible PM Emissions
$PM_{2.5}$ Emissions	-	-	-	Negligible PM Emissions
Coal Yard Diesel Tank - Total Emissions	No Data	No Data	No Data	Negligible - Diesel fuel has low volatility
PM_{10} Emissions	-	-	-	Negligible PM Emissions
$PM_{2.5}$ Emissions	-	-	-	Negligible PM Emissions
Pyrite Dumping (Units 4&6) - Total Emissions	13.30	6.65E-03	1.52E-03	Pyrite dumping 365 tons@ 0.07707 lb/ton using AP-42 13.2.4 U=7.76 mi/hr M = 0.25%
PM_{10} Emissions	13.30	6.65E-03	1.52E-03	Pyrite dumping 365 tons@ 0.03645 lb/ton using AP-42 13.2.4 U=7.76 mi/hr M = 0.25%
$PM_{2.5}$ Emissions	2.01	1.01E-03	2.30E-04	Pyrite dumping 365 tons@ 0.00552 lb/ton using AP-42 13.2.4 U=7.76 mi/hr M = 0.25%
Fly Ash Loading - Total Emissions	568.72	0.28	0.06	Fly ash loading of 41,175 tons@ 0.0292 lb/ton using AP-42 13.2.4 U=7.76 mi/hr M = 0.5%
PM_{10} Emissions	568.72	0.28	0.06	Fly ash loading of 41,175 tons@ 0.01381 lb/ton using AP-42 13.2.4 U=7.76 mi/hr M = 0.5%
$PM_{2.5}$ Emissions	86.12	0.04	9.83E-03	Fly ash loading of 41,175 tons@ 0.00209 lb/ton using AP-42 13.2.4 U=7.76 mi/hr M = 0.5%
Unit 5 Cyclone Dumper - Total Emissions	No Data	No Data	No Data	Outage only, carried out by Clean Harbors
PM_{10} Emissions	No Data	No Data	No Data	Outage only, carried out by Clean Harbors
$PM_{2.5}$ Emissions	No Data	No Data	No Data	Outage only, carried out by Clean Harbors
Chem. Lab - Total Emissions	No Data	No Data	No Data	Negligible emissions
PM Emissions	-	-	-	Negligible PM Emissions
PM_{10} Emissions	-	-	-	Negligible PM Emissions
$PM_{2.5}$ Emissions	-	-	-	Negligible PM Emissions
Small Baghouse on Fly Ash Silo - Total Emissions	13.65	6.82E-03	1.56E-03	Using AP-42 11.12, 0.00099 lb/ton for pneumatic cement silo loading @ 40,147 ton/yr in 2009
PM_{10} Emissions	13.65	6.82E-03	1.56E-03	Using AP-42 11.12, 0.00034 lb/ton for pneumatic cement silo loading @ 40,147 ton/yr in 2009
$PM_{2.5}$ Emissions	6.02	3.01E-03	6.87E-04	Using AP-42 11.12, 0.00015 lb/ton for pneumatic cement silo loading @ 40,147 ton/yr in 2009 and 15% PM2.5 from Table B.2.2 category 3.
Small Baghouse on Wood Fuel Silo (2) - Total Emissions	1.46	7.32E-04	1.67E-04	Using AP-42 11.12, 0.00099 lb/ton for pneumatic cement silo loading @ 4,306 ton/yr in 2009
PM_{10} Emissions	1.46	7.32E-04	1.67E-04	Using AP-42 11.12, 0.00034 lb/ton for pneumatic cement silo loading @ 4,306 ton/yr in 2009
$PM_{2.5}$ Emissions	0.65	3.23E-04	7.37E-05	Using AP-42 11.12, 0.00015 lb/ton for pneumatic cement silo loading @ 4,306 ton/yr in 2009 and 15% PM2.5 from Table B.2.2 category 3.
Small Baghouse on Wood Ash Silo - Total Emissions	188.69	0.09	0.02	Using AP-42 11.12, 0.00099 lb/ton for pneumatic cement silo loading @ 554,975 ton/yr in 2009
PM_{10} Emissions	188.69	0.09	0.02	Using AP-42 11.12, 0.00034 lb/ton for pneumatic cement silo loading @ 554,975 ton/yr in 2009
$PM_{2.5}$ Emissions	83.25	0.04	9.50E-03	Using AP-42 11.12, 0.00015 lb/ton for pneumatic cement silo loading @ 554,975 ton/yr in 2009 and 15% PM2.5 from Table B.2.2 category 3.
Limestone Silo Dust Collector - Total Emissions	-	-	-	Using AP-42 11.12, 0.00099 lb/ton for pneumatic cement silo loading @ 0 ton/yr maximum. Not currently in use.
PM_{10} Emissions	-	-	-	Using AP-42 11.12, 0.00034 lb/ton for pneumatic cement silo loading @ 0 ton/yr maximum. Not currently in use.
$PM_{2.5}$ Emissions	-	-	-	Using AP-42 11.12, 0.00015 lb/ton for pneumatic cement silo loading @ 0 ton/yr maximum. Not currently in use.
Baghouse For Final Coal Crusher - Total Emissions	85.34	0.04	9.74E-03	Using AP-42 11.12, 0.00099 lb/ton for pneumatic cement silo loading @ 251,000 ton/yr in 2009

TABLE I
REVISED LIST OF INSIGNIFICANT ACTIVITIES

Public Service Company of New Hampshire
Schiller Station
Portsmouth, New Hampshire

Insignificant Activity	Annual Actual Emissions (lbs/yr)	Annual Actual Emissions (tons/yr)	Annual Actual Emissions (lbs/hr)	Emissions Notes
PM_{10} Emissions	85.34	0.04	9.74E-03	Using AP-42 11.12, 0.00034 lb/ton for pneumatic cement silo loading @ 251,000 ton/yr in 2009
$PM_{2.5}$ Emissions	37.65	0.02*	4.30E-03	Using AP-42 11.12, 0.00015 lb/ton for pneumatic cement silo loading @ 251,000 ton/yr in 2009 and 15% PM2.5 from Table B.2.2 category 3.
Coal Bunker Dust Collection - Total Emissions	0.85	4.27E-04	9.74E-05	Using AP-42 11.12, 0.00099 lb/ton for pneumatic cement silo loading with a 99% efficiency @ 250,999 ton/yr in 2009
PM_{10} Emissions	0.85	4.27E-04	9.74E-05	Using AP-42 11.12, 0.00034 lb/ton for pneumatic cement silo loading with a 99% efficiency @ 250,999 ton/yr in 2009
$PM_{2.5}$ Emissions	0.38	1.88E-04	4.30E-05	Using AP-42 11.12, 0.00015 lb/ton for pneumatic cement silo loading with a 99% efficiency @ 250,999 ton/yr in 2009 and 15% PM2.5 from Table B.2.2 category 3.
Flyash Blower Exhaust Total Emissions	13.65	6.82E-03	1.56E-03	Using AP-42 11.12, 0.00099 lb/ton for pneumatic cement silo loading @ 40,147 ton/yr in 2009
PM_{10} Emissions	13.65	6.82E-03	1.56E-03	Using AP-42 11.12, 0.00034 lb/ton for pneumatic cement silo loading @ 40,147 ton/yr in 2009
$PM_{2.5}$ Emissions	6.02	3.01E-03	6.87E-04	Using AP-42 11.12, 0.00015 lb/ton for pneumatic cement silo loading @ 40,147 ton/yr in 2009 and 15% PM2.5 from Table B.2.2 category 3.
White Building Heating System - Total Emissions	98.81	0.05	0.01	0.131 MMBTU/HR#2 Oil, 25% capacity @ 5110 hours/yr @ 80.91 lb/1000 gallons
PM_{10} Emissions	1.22	6.11E-04	1.39E-04	0.131 MMBTU/HR#2 Oil, 25% capacity @ 5110 hours/yr @ 1 lb/1000 gallons
$PM_{2.5}$ Emissions	0.29	1.47E-04	3.35E-05	0.131 MMBTU/HR#2 Oil, 25% capacity @ 5110 hours/yr @ 0.24 lb/1000 gallons
Red Building Heating System - Total Emissions	206.73	0.10	0.02	0.274 MMBTU/HR#2 Oil, 25% capacity @ 5110 hours/yr @ 80.91 lb/1000 gallons
PM_{10} Emissions	2.56	1.28E-03	2.92E-04	0.274 MMBTU/HR#2 Oil, 25% capacity @ 5110 hours/yr @ 1 lb/1000 gallons
$PM_{2.5}$ Emissions	0.61	3.07E-04	7.00E-05	0.274 MMBTU/HR#2 Oil, 25% capacity @ 5110 hours/yr @ 0.24 lb/1000 gallons
Vet Building Heating System - Total Emissions	87.86	0.04	0.01	0.129 MMBTU/HR#2 Oil, 25% capacity @ 5110 hours/yr @ 80.91 lb/1000 gallons
PM_{10} Emissions	1.09	5.43E-04	1.24E-04	0.129 MMBTU/HR#2 Oil, 25% capacity @ 5110 hours/yr @ 1 lb/1000 gallons
$PM_{2.5}$ Emissions	0.26	1.30E-04	2.98E-05	0.129 MMBTU/HR#2 Oil, 25% capacity @ 5110 hours/yr @ 0.24 lb/1000 gallons
Building at New Site Heating System - Total Emissions	258.41	0.13	0.03	0.294 MMBTU/HR#2 Oil, 25% capacity @ 5110 hours/yr @ 80.91 lb/1000 gallons
PM_{10} Emissions	3.19	1.60E-03	3.65E-04	0.294 MMBTU/HR#2 Oil, 25% capacity @ 5110 hours/yr @ 1 lb/1000 gallons
$PM_{2.5}$ Emissions	0.77	3.83E-04	8.75E-05	0.294 MMBTU/HR#2 Oil, 25% capacity @ 5110 hours/yr @ 0.24 lb/1000 gallons
SR Generator (Natural Gas) - Total Emissions	0.48	2.42E-04	5.53E-05	9.5E-3 lb/mmbtu from AP-42 3.2-3 (rich burn < 90% load)
PM_{10} Emissions	0.48	2.42E-04	5.53E-05	9.5E-3 lb/mmbtu from AP-42 3.2-3 (rich burn < 90% load)
$PM_{2.5}$ Emissions	0.48	2.42E-04	5.53E-05	9.5E-3 lb/mmbtu from AP-42 3.2-3 (rich burn < 90% load)
High Yard Generator (Natural Gas) - Total Emissions	213.17	0.11	0.02	9.74 lb/mmbtu from AP42 3.2-2, 0.5 hrs every two weeks, and manufacturer data
PM_{10} Emissions	1.69E-03	8.44E-07	1.93E-07	7.71E-5 lb/mmbtu from AP42 3.2-2, 0.5 hrs every two weeks, and manufacturer data
$PM_{2.5}$ Emissions	1.69E-03	8.44E-07	1.93E-07	7.71E-5 lb/mmbtu from AP42 3.2-2, 0.5 hrs every two weeks, and manufacturer data
Coal Handling/Unloader - Total Emissions	219.63	0.11	0.03	650,000 tons @ 0.000714 lb/ton using AP-42 13.2.4 U=7.76 mi/hr M = 7.08%
PM_{10} Emissions	219.63	0.11	0.03	650,000 tons @ 0.000338 lb/ton using AP-42 13.2.4 U=7.76 mi/hr M = 7.08%
$PM_{2.5}$ Emissions	33.26	0.02	3.80E-03	650,000 tons @ 0.0000512 lb/ton using AP-42 13.2.4 U=7.76 mi/hr M = 7.08%
Coal Truck Loading - Total Emissions	88.92	0.04	0.01	Truck loading 263,173 (from 2009) tons@ 0.000714 lb/ton using AP-42 13.2.4 U=7.76 mi/hr M = 7.08%
PM_{10} Emissions	88.92	0.04	0.01	Truck loading 263,173 (from 2009) tons@ 0.000338 lb/ton using AP-42 13.2.4 U=7.76 mi/hr M = 7.08%
$PM_{2.5}$ Emissions	13.47	6.73E-03	1.54E-03	Truck loading 263,173 (from 2009) tons@ 0.0000512 lb/ton using AP-42 13.2.4 U=7.76 mi/hr M = 7.08%
Wood Truck Dumping - Total Emissions	14.08	7.04E-03	1.61E-03	Truck dumping 554,975 tons@ 0.0000536 lb/ton using AP-42 13.2.4 U=7.76 mi/hr M = 45%
PM_{10} Emissions	14.08	7.04E-03	1.61E-03	Truck dumping 554,975 tons@ 0.0000254 lb/ton using AP-42 13.2.4 U=7.76 mi/hr M = 45%
$PM_{2.5}$ Emissions	2.13	1.07E-03	2.43E-04	Truck dumping 554,975 tons@ 0.00000384 lb/ton using AP-42 13.2.4 U=7.76 mi/hr M = 45%
Unpaved Haul Road - Total Emissions	212.78	0.11	0.02	Road in coal yard used equation $E=k(s/12)^a(W/3)^b$ from EPA AP42 13.2.2-1 k=4.9, s=8.5%, a=0.7, W=21.5 tons, b=0.45
PM_{10} Emissions	212.78	0.11	0.02	Road in coal yard used equation $E=k(s/12)^a(W/3)^b$ from EPA AP42 13.2.2-1 k=1.5, s=8.5%, a=0.9, W=21.5 tons, b=0.45
$PM_{2.5}$ Emissions	21.28	0.01	2.43E-03	Road in coal yard used equation $E=k(s/12)^a(W/3)^b$ from EPA AP42 13.2.2-1 k=0.15, s=8.5%, a=0.9, W=21.5 tons, b=0.45
Boiler Water Treatment Chem. - Total Emissions	No Data	No Data	No Data	Inorganic chemicals all with low volitility
PM_{10} Emissions	-	-	-	Negligible PM Emissions
$PM_{2.5}$ Emissions	-	-	-	Negligible PM Emissions
Wood Handling System and Roof Fans - Total Emissions	323.11	0.16	0.04	Truck dumping 554,975 tons@ 0.00123 lb/ton using AP-42 13.2.4 U=7.76 mi/hr M = 4.8%
PM_{10} Emissions	323.11	0.16	0.04	Truck dumping 554,975 tons@ 0.0005822 lb/ton using AP-42 13.2.4 U=7.76 mi/hr M = 4.8%
$PM_{2.5}$ Emissions	48.93	0.02	5.59E-03	Truck dumping 554,975 tons@ 0.0000882 lb/ton using AP-42 13.2.4 U=7.76 mi/hr M = 4.8%

ATTACHMENT 2

COMPLIANCE ASSURANCE MONITORING PLAN
Public Service of New Hampshire, Schiller Station
Portsmouth, New Hampshire

1.0 FACILITY INFORMATION

Public Service Company of New Hampshire's (PSNH's) Schiller Station, located in Portsmouth, New Hampshire generates electricity by means of combusting fossil fuels and biomass. The emissions units at Schiller Station consist of three generating units; Unit 4 (SR4), Unit 5 (SR5), and Unit 6 (SR6), a coal crusher, combustion turbine (CT), and an emergency generator. For electricity generation, Schiller Station primarily combusts wood in SR 5 and a mixture of coal and biomass in SR4 and SR6. However, Schiller Station can generate electricity using other fuels: SR4 and SR6 can burn No. 6 fuel oil, SR 5 is capable of combusting coal, the emergency generator burns natural gas and propane, and the combustion turbine burns natural gas, kerosene, and JP-4. The control equipment used to reduce pollutant emissions from these sources includes: the use of selective non-catalytic reduction (SNCR) and an electrostatic precipitator (ESP) for units SR4 and SR6; and a baghouse, SNCR, and limestone injection system for unit SR5. 40 CFR 64.2 (b) (vi) exempts control units for which a part 70 or 71 permit specifies a continuous compliance determination method. Therefore, due to the use of the continuous emissions monitoring system which monitors NO_X and SO_2 among other parameters, the SNCR and the limestone injection are not subject to Compliance Assurance Monitoring (CAM) Plan requirements. Emission units subject to a post-1990 emission limitation under Sections 111 or 112 of the Clean Air Act are also exempt for the pollutants regulated under that standard. The PM10 emission limits for SR5 were established in accordance with Title 40 CFR 63 Subpart B and Clean Air Act Section 112 (j); therefore, according to 40 CFR 64.2 (b) (i), SR5 is not subject to the CAM requirements for particulate matter.

2.0 – POLLUTION CONTROL DEVICE SUMMARY

Control Device	Pollutant	Unit(s)	Applicable
Baghouse	PM	SR 5	No (section 112 (j) emission limits) 40 CFR 64.2 (b) (i)
Electrostatic Precipitator	PM	SR4, SR6	X
Selective Non-catalytic Reduction	NO_X	SR4, SR5, SR6	No (CEM)
Limestone Injection System	SO_2	SR5	No (CEM)

3.0 ELECTROSTATIC PRECIPITATOR

In accordance with the applicability criteria listed in 40 CFR 64.2(a), Schiller Station is required to develop a CAM Plan for the SR4 and SR6 electrostatic precipitators (ESPs) as described below:

- Schiller Station is a major source and has a Title V Permit;
- Units SR4 and SR6 are subject to existing Title V Permit limits for particulate matter. The Title V Permit was originally issued on March 9, 2007, and expires on March 31, 2012. This CAM Plan is a component of the renewal application for the Schiller Station Title V Permit.
- The SR4 and SR6 each utilize a control device (electrostatic precipitator [ESP]) to achieve compliance with the particulate matter emissions limitations contained in the permit.
- The pre-controlled, potential PM/PM10 emission rate is above the major source level of 100 tons per year.

Based on these facts, the ESP is subject to the CAM requirements for particulate matter.

3.1 PERFORMANCE INDICATORS

The selected performance indicators for the ESP are secondary voltage (Indicator 1) and periodic inspection and preventative maintenance of the ESP systems (Indicator 2).

Secondary voltage was selected because it is a generally accepted indicator associated with ESP performance, and will readily allow for the detection and correction of the ESP performance issues. The measurement of secondary voltage outside the indicator range would require corrective action.

Periodic inspections of ESP system components are conducted according to the Inspection and Preventative Maintenance Plan for Schiller Unit 4 and Unit 6 (ESP I/M Plan). Equipment failures identified during inspections trigger prompt corrective action.

3.2 MONITORING APPROACH

Indicator 1

The secondary voltage measured at each of the ESP TR sets is monitored by the precipitator control system. Voltage is measured electronically by circuit boards in the control system and displayed locally at each TR set as well as on the control system computer. Monitoring and recording of the secondary voltage indicator is done when the unit is operating and the data collected used to calculate a three hour average value.

Indicator 2

Monitoring of Distributive Control System (DCS), Continuous Emission Monitors (CEMS), the ash system Programmable Logic Controllers (PLCS), precipitator control system transformer-rectifier performance and rapper operation occur daily from within the control room by Station Control Operators.

Weekly and monthly inspections of various components of the ESPs and ash systems are conducted as a preventative measure to identify leaks, signs of deterioration, noise, vibrations or other abnormal conditions that may lead to malfunctions.

Regular overhauls are conducted to clean and inspect the ESPs. Overhauls are conducted on a 12 – 24 month schedule depending on the operating schedule of Units 4 and 6.

3.3 INDICATOR RANGES

Indicator 1

The secondary voltage drop at the TR sets shall be between 25 and 60 kilovolts, direct current (KVDC). If the secondary voltage drop is less than 25 KVDC then the ESP may not generate enough of a charge to attract the particles.

An excursion is defined as secondary voltage level below 25KV (3 hour average value). Excursions trigger an inspection, corrective action and reporting requirements.

Indicator 2

Inspections will be conducted according to the ESP I/M Plan.

An excursion of the Indicator 2 range occurs when there is a failure to conduct an inspection; or, an equipment failure identified during the inspection triggers a corrective action and a reporting requirement.

4.0 CONTROL DEVICE CAM SUMMARY TABLES

TABLE 3 CAM PLAN SUMMARY ELECTROSTATIC PRECIPITATOR UNIT 4 AND UNIT 6		
Indicator	**Indicator No. 1 Secondary Voltage**	**Indication No. 2 Inspection and Maintenance (I/M)**
1. Measurement Approach	ESP secondary voltage is electronically measured at each TR set for each precipitator field to monitor ESP operation. The secondary voltage is measured by the precipitator control system at each TR set.	Inspections are performed according to the SR ESP I/M Plan. Maintenance is performed as needed.
2. Indicator Range	An excursion is defined as a secondary voltage level less than 25 kV. Excursions trigger an inspection, corrective action, and a reporting requirement.	Failure to perform an inspection triggers a reporting requirement. Equipment failures identified during an inspection trigger corrective action and a reporting requirement.
3. Performance Criteria a. Data Representativeness	Secondary voltage is measured electronically by circuit boards in the control system	Inspections are performed at the ESP.
b. QA/QC Practice and Procedures	Confirm that the DCS monitoring PC displays zero when the unit is not operating.	Inspections are performed by qualified personnel.
c. Monitoring Frequency	Continuously.	Inspections are performed according to the SR ESP I/M Plan. Maintenance is performed as needed.
d. Data Collection Procedure	Data is collected on a continuous basis using the Distributive Control System (DCS).	Records of the inspections and maintenance are stored in the Plant Maintenance Management System (PMMS).
e. Averaging Period	3-hr.	Not applicable.

INSPECTION AND MAINTENANCE PLAN FOR SCHILLER #4 & 6

Daily when Unit is Operating

1. The Distributed Control System (DCS) monitors, records and alarms secondary voltage readings.
2. The Continuous Emissions Monitor (CEM) monitors, records and alarms opacity.
3. The Ash System Programmable Logic Controller (PLC) monitors and alarms the ash system.
4. The Precipitator Control System monitors T-R performance.
5. The Precipitator Control System monitors rapper operation.

Weekly

1. El. 56 Precipitator Control Room: Check Operation of Collector Rapper control system
2. Check the precipitator hopper area for air leaks.
3. Precipitator Penthouse: Check the operation of the emitter rappers; check for oil leaks; inspect penthouse doors.
4. Check the collector rapper motor/gearbox and verify operation of the collector rappers

Monthly

1. Check operation of penthouse pressurizing fan.
2. Check exterior for visual signs of deterioration and abnormal noises, vibration, leaks, and the like.
3. Check T-R liquid.

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Quarterly

1. Complete opacity monitor audit.

Unit Overhauls (Conducted 12-24 month interval depending on Unit Operation)

1. Conduct internal inspection.
2. Inspect all bushings and insulators and clean as necessary.
3. Inspect all door gaskets and replace as necessary.
4. Inspect door bolts and dogs and clean and lubricate as necessary.
5. Inspect the collector rapper system including hammers and strike plates and repair as necessary.
6. Check all ground connections to the emitter rappers.

7. Inspect emitter rapper and leading and trailing rapper shaft boots.
8. Inspect the inlet and outlet duct work including turning vanes and perforated plates for wear/ holes/ or excessive ash build up.
9. Inspect the penthouse pressurization blower system.
10. Inspect the Power Switching Cabinets.
11. Check for areas of corrosion and deterioration.