Public Service of New Hampshire

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The Northeast Utilities System

D28205

July 28, 2009

Ms. Michele R. Andy, Administrator
Permitting & Environmental Health Bureau
Air Resources Division
NH Dept. of Environmental Services
29 Hazen Drive, PO Box 95
Concord, NH 03302-0095

Public Service Company of New Hampshire
Merrimack Station, Bow, NH
Additional Information; Application #FY96-TV048

Dear Ms. Andy:

In response to your request for additional information, dated April 13, 2008, Public Service Company of New Hampshire (PSNH) is providing the enclosed air quality modeling demonstration as an update to its previously submitted air toxics compliance demonstration. The enclosed demonstration documents PSNH's continued compliance with the regulated toxic air pollutant regulations (RSA 125-I and Env-A 1400) for Merrimack Station.

In addition, PSNH is submitting information requested in a subsequent request, dated June 11, 2008, from Elizabeth Nixon of the New Hampshire Department of Environmental Services, Air Resources Division (DES) to Laurel L. Brown of PSNH – Generation. This additional information includes (1) Best Management Practice – Coal Handling, (2) an updated list of insignificant activities, and (3) potential and actual Hazardous Air Pollutant (HAP) emissions.

Should you have any questions regarding the enclosed information or require additional information, please contact Laurel L. Brown, PSNH – Generation, at 634-2331 or brownll@psnh.com.

"I am authorized to make this submission 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,

John M. MacDonald
Vice President – Generation

Enclosure

Technical Memorandum

Dispersion Modeling of Fugitive Coal Dust at Merrimack Station

TRC Companies, Inc.
Lowell, Massachusetts, USA
July 2009

INTRODUCTION

In response to a request by the New Hampshire Department of Environmental Services, Air Resources Division (DES), Public Service Company of New Hampshire (PSNH) is submitting this air quality modeling report to DES as a demonstration of compliance with the regulated toxic air pollutant regulations (RSA 125-I and Env-A 1400) for coal dust for Merrimack Station. The New Hampshire Air Toxics Control Act requires facilities to demonstrate compliance with applicable Ambient Air Limits (AAL) at their property boundary. Under Chapter Env-A 1400, coal dust is a regulated toxic air pollutant. According to Table 1450-1, the 24-hour AAL for bituminous coal dust is 4.5 $\mu g/m^3$ and the annual AAL is 3.0 $\mu g/m^3$.

Coal dust generated from coal handling operations at Merrimack Station is subject to the regulation. These operations include (1) unloading of the railcars in the railcar shed, (2) load-out of the railcar coal from the conveyor system, and (3) unloading of coal from trucks.

The air quality modeling demonstrated that coal dust emissions from Merrimack Station are in compliance with the toxic air pollutant requirements of RSA 125-I and Env-A 1400.

MODELING APPROACH

Railcar Unloading

The railcar unloading occurs in a roofed shed with openings on the sides. The fugitive coal dust from the shed will be a volume source with initial dimensions proportional to the height, width and length of the shed. Since the material is dumped from the railcar, the emission factor was calculated from section 13.2.4 of AP-42 which provides estimates for aggregate handling. The relationship is,

$$E = 0.0032\ (k)\ (U/5)^{1.3}/(M/2)^{1.4} \qquad \text{Equation (1)}$$

where,
E is the emission factor in pounds of particulate per ton of material handled,
k = 0.35 for PM_{10},
U is the mean wind speed at the site in mph, and
M is the moisture content of the coal in percent.

U was calculated from the 23 months of onsite wind speed data at the 10m level of the meteorological tower. The mean wind speed was 5.42 mph. The moisture content varies with the origin of the coal.

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Since the unloading process is enclosed within the shed plus a wet suppression system is used during railcar unloading, the control efficiency was estimated at 90%.

Conveyor Load-out

After the coal is unloaded from the railcar, it is taken by conveyor to a boom that drops the coal to the appropriate pile. Since the material is dropped, this was also modeled as a volume source. The boom radius and height of the surrounding coal piles were used to calculate the initial dimensions of the volume source. The height of the volume source was estimated as half the drop height. Equation (1) was also used to estimate the emissions released.

Truck Unloading

Coal is also delivered by truck and unloaded in the coal pile area near the conveyor load-out system. This material is also dropped and was modeled as a volume source. The height of the surrounding coal piles and the area where the coal is delivered were used to estimate the initial dimensions of the volume source. The height of the volume source was estimated as half the drop height. Equation (1) was used to estimate the emissions released.

From Table 13.2.4-1 of AP-42, a mean value of the silt percentage of coal received at coal-fired power plants was measured from 60 samples as 2.2%. This value has been adopted for this modeling analysis.

MODELING DATA

The meteorological and model receptor data were obtained from the recent air modeling study for the Clean Air Project at Merrimack Station. The meteorological data were from the meteorological tower and SODAR system located at the site. These data covered the 23-month period from January 1994 through November 1995. These data were processed using the AERMET preprocessor program to prepare the meteorological data for AERMOD. The 293 fenceline receptors, which were prepared from the AERMAP preprocessor program, were used to predict coal dust concentrations at the property boundary. Plots of the fenceline receptors and the fugitive coal dust sources are shown in Figures 1 and 2.

The emissions calculations for the volume sources are presented in Table 1. The primary assumptions are:

- One train with 90 railcars will unload in 12 hours
- Each railcar unloads 100 tons of coal
- 100 trains per year will deliver coal
- 10,000 trucks per year will deliver coal
- Each truck will unload 30 tons of coal
- Up to 2000 tons of coal will be delivered in a day during a 12 hour period by truck
- The coal will drop 6 feet during truck delivery
- The coal load-out by conveyor will drop 30 feet
- The boom radius for coal load-out is 91.5 feet
- The coal pile height is 50 feet
- The moisture content of the different coals are:
  - Pile A 7.08%
  - Pile B 6.6%
  - Pile C 6.36%
  - Pile D 5.88%

Figure 1 Fugitive coal dust source locations (shown as green squares) and fenceline receptors. The plant combustion sources and buildings are noted for reference.

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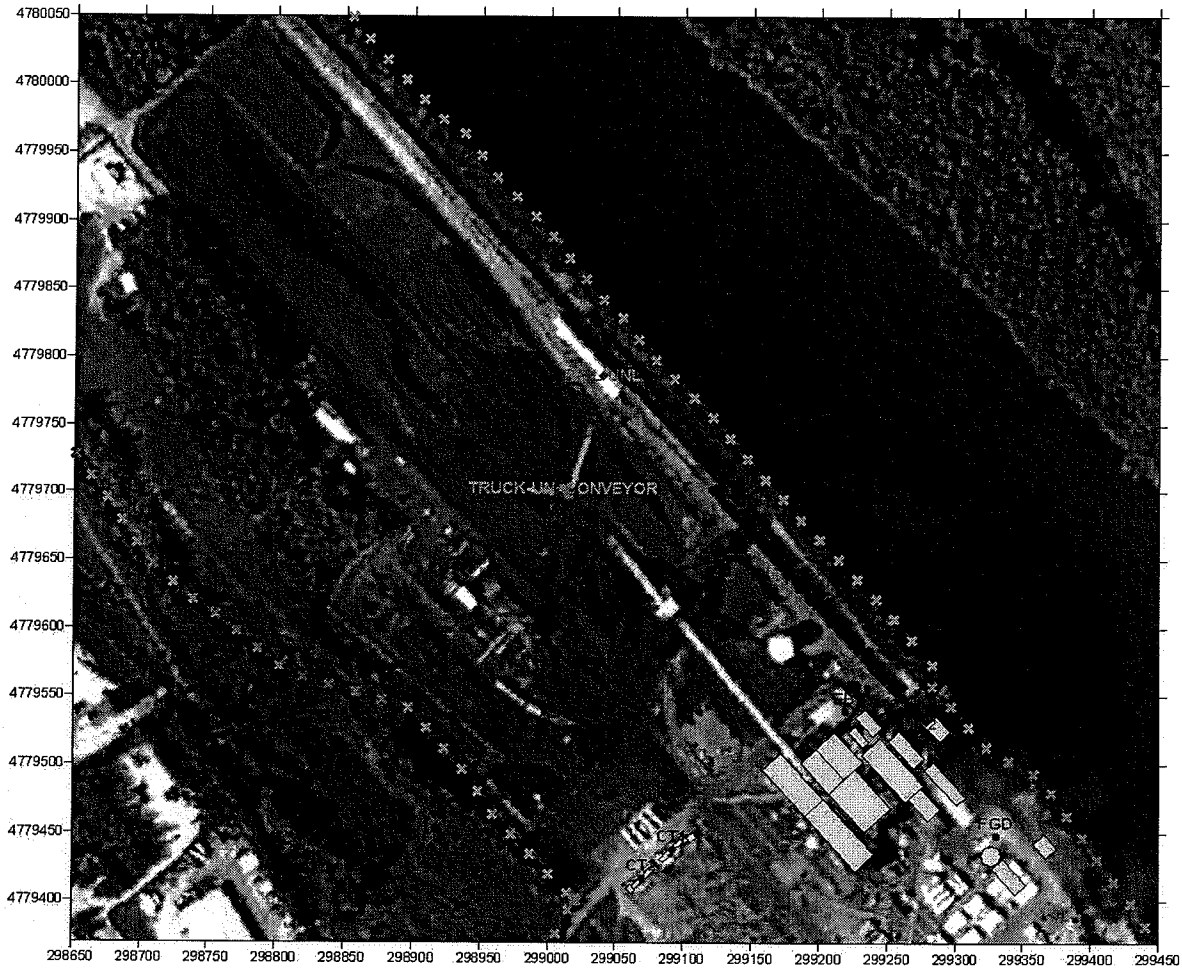

Figure 2 Fugitive coal dust source locations and fenceline receptors (zoomed view). The plant combustion sources and buildings are noted for reference.

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Table 1: Emission Calculations for Fugitive Coal Dust Sources

Parameter	Units	Railcar Unloading	Trucks	Coal Load-Out
Source ID	---	Rail	Truck	Loadout
Source Type	---	Volume	Volume	Volume
Location	---	Railcar shed center	boom center	boom center
UTM E1	m	299039.3	299010.7	299010.7
UTM N1	m	4779786.6	4779703.0	4779703.0
Base Elevation	m MSL	62.8	62.8	62.8
Obstacle Height	m	10.06	15.24	15.24
Length	m	19.96	49.4	49.4
Width	m	11.89	49.4	49.4
Volume Source Height	m	5.03	0.91	4.57
Sigma-z0	m	4.68	7.09	7.09
Sigma-y0	m	4.04	12.97	12.97
Hours unloading per day	---	12	12	12
Coal handled	TPD	9000	2000	9000
Coal handled	TPH	750	167	750
Coal handled	TPY	900,000	300,000	900,000
PM10 (24-hour)	g/s	0.00115	0.00223	0.01149
PM10 (annual)	g/s	0.00031	0.00091	0.00315
Coal				
Moisture	%	6.42	7.08	6.42
Silt	%	2.2	2.2	2.2
Particle size mult. (k)		0.35	0.35	0.35
Mean wind speed	mph	5.42	5.42	5.42
Emission factor (E)	lb/Ton	0.000243	0.000212	0.000243
Control Efficiency	%	90	0	0
Emission factor (model)	lb/Ton	0.000024	0.000212	0.000243

MODELING RESULTS

The AERMOD model (version 07026) was used to model the volume sources. The maximum 24-hour averaged coal dust concentration at the property line was predicted to be 4.2 $\mu g/m^3$ during 1994 and 3.9 $\mu g/m^3$ during 1995. These concentrations are below the 24-hour AAL of 4.5 $\mu g/m^3$. The maximum predicted values are also conservative. The days associated with those maximum concentrations in both 1994 and 1995 had 15 hours with wind speeds below 1.0 m/s. The emission factors used in the modeling assumed the mean annual wind speed of 2.4 m/s so that the emissions modeled for those light wind speed hours were more than triple the emissions that would have been calculated if hourly emissions were used.

The maximum annual averaged coal dust concentration at the property line was predicted to be 0.3 $\mu g/m^3$ in 1994 and 0.3 $\mu g/m^3$ in 1995. These modeled concentrations of coal dust are below the annual AAL of 3.0 $\mu g/m^3$.

Therefore, coal dust emissions at Merrimack Station are in compliance with the requirements of RSA 125-I and Env-A 1400.

MKEP022 Best Management Practice – Coal Handling

1. PURPOSE

The purpose of this procedure is to ensure that coal handling operations at Merrimack Station minimize generation of fugitive coal dust emissions and to implement the requirements in the current Air Permits covering the Primary & Secondary Coal Crushers.

2. APPLICABILITY

This procedure applies to all employees at Merrimack Station.

3. REFERENCES

3.1. Air Permit PO-BP-2416 Primary Coal Crusher

3.2. Air Permit PO-BP-2417 Secondary Coal Crusher

4. DEFINITIONS

5. RESPONSIBILITIES

5.1. All employees - coal handling activities are to be performed in such a way as to minimize generating fugitive coal dust emissions.

6. PROCEDURE

6.1. Title V Air Permit Application: A calculation on fugitive dust emissions from the coal yard is included in the CAA Title V permit application and is based on the quantity of coal handled annually at the station. From this calculation, fees are assessed.

6.2. Primary & Secondary Coal Crushers: The primary and secondary coal crushers are permitted by the NH Department of Environmental Services Air Resources Division (NHDESARD). The permits specify fugitive dust emissions as follows:

6.2.1. Fugitive dust emissions from each device are restricted to not exceed an average of 20% opacity for any continuous 6 minute period in any 60 minute period.

6.2.2. The Primary Coal Crusher (car dumper) system and enclosure shall be inspected and maintained regularly. Any failures of this enclosure to prevent fugitive emissions shall be repaired immediately. If visible emissions from the primary coal crusher enclosure or breaks in the structure of the enclosure are observed, then repairs shall be made immediately. A log of repairs shall be maintained.

6.2.3. The Secondary Coal Crusher (crusher house) are fully enclosed in an aboveground building. Any failures to this enclosure to prevent fugitive emissions shall be repaired immediately. If visible dust emissions are observed, immediate action is taken to correct the cause or minimize the emissions. Any failures of the crusher building or enclosure shall be repaired immediately and a record placed in the NGS Plant Manager describing the work and repairs.

6.2.4. To demonstrate compliance with the opacity limit on the Secondary Crusher, the Station Contact makes monthly observations of visible emissions during operation in accordance with Method 22, 40CFR Part 60, Appendix A. A preventative maintenance trouble report in the NGS Plant Manager system is used to initiate this activity.

6.2.5. If visible emissions from either coal crusher enclosures or breaks in the enclosures are observed or if the opacity limit is exceeded, notify the DES within 8 working hours by phone and within 15 days in writing. Include the episode in the Annual Excess Emission Report.

6.3. Fugitive particulate emissions from the main coal piles shall be controlled by compaction techniques.

6.4. Coal Handling:

6.4.1. To reduce fugitive emissions from Merrimack Station, all crusher house and tripper room doors and windows must be kept closed when bunkering or performing operations from which excessive dust is generated.

6.4.2. The dust allaying system is used as necessary while unloading trains in the car dumper except during the winter months (no freeze protection).

6.4.3. The dust gates on the secondary coal crushers are maintained and periodically adjusted to minimize emissions during periods of no coal flow.

6.4.4. The draft equalization duct is inspected and cleaned routinely to minimize dust emissions from the secondary crushers.

7. RECORDKEEPING

7.1. NGS Plant Manager System – Recurring preventative maintenance job order to conduct monthly observations; Results of observations; Trouble reports initiating corrective actions resulting form observations including the date the problem was observed, date of repair, description of the problem and corrective actions taken.

7.2. Station Contact Emission Records - Monthly crusher house observations. Any excursions are reported in the Annual Excess Emission Report.

7.3. Copies of all records shall be retained for a minimum of four years and shall be made available to the NHDES upon request. However, these records shall not be discarded, removed, or destroyed thereafter without the express written approval of the Director NHDESARD.

8. ATTACHMENTS

9. HISTORY OF REVISIONS

07/27/09 AAA, RFD, LLB, PRR, HEK, DAF, BJN – review and recertify.

06/12/07 AAA, HEK, DAF, BJN – Apply revised EMS template; update station contacts.

7/22/04 AAA & HEK, EMS Audit – Current practice confirmed.

TABLE 1
LIST OF INSIGNIFICANT ACTIVITIES

Public Service Company of New Hampshire
Merrimack Station
Bow, New Hampshire

Insignificant Activity	Annual Actual Emissions (pounds)	Notes
Solvent Cold Cleaning Station 1	534.6	81 gallons per year of solvent loss per 45 gallon machine
Solvent Cold Cleaning Station 2	534.6	81 gallons per year of solvent loss per 45 gallon machine
Solvent Cold Cleaning Station 3	534.6	81 gallons per year of solvent loss per 45 gallon machine
Solvent Cold Cleaning Station 4	534.6	81 gallons per year of solvent loss per 45 gallon machine
Solvent Cold Cleaning Temporary Units (3 units <60 days)	263.6	81 gallons per year of solvent loss per 45 gallon machine 3 units @ 60 days
Slag Tank Warm-up Lines MK1 and MK2	NA	Bypass of boiler exhaust to warm Slag Tanks. Emissions accounted for in boiler emissions
600-Gallon Gasoline Tank Vehicle Fueling	71.1	3500 gallons @ 20.3 lb / 1000 gallons
Shot Hoppers Ash Dumping	No Data	Normally reinjected into boiler w/o dumping. Dumping only occurs during start-up or when there are problems with the pneumatic ash transfer system. See Fly Ash Tank unloading.
SCR Economizer Hoppers Ash Dumping	No Data	Normally reinjected into boiler w/o dumping. Dumping only occurs during start-up or when there are problems with the pneumatic ash transfer system. See Fly Ash Tank unloading.
SCR Reactor Hoppers Ash Dumping	No Data	Normally reinjected into boiler w/o dumping. Dumping only occurs during start-up or when there are problems with the pneumatic ash transfer system. See Fly Ash Tank unloading.
Chemical Lab Hood Vents	No Data	Negligible emissions
House Vacuum System w/ baghouse	0.3	0.00034 lb/ton for controlled pneumatic transfer of cement at up to 1000 tons of material collected by vacuum
Crusher House Propane Heating System	419.1	1.343 MMBTU/hr propane, 25% capacity @ 5110 hours/yr @ 22.35 lb/1000 gallons
Warehouse A #2 Fuel Oil Heating Furnace System	258.4	0.35 MMBTU/HR #2 fuel oil, 25% capacity @ 5110 hours/yr @ 80.91 lb/1000 gallons
Warehouse E Propane Heating System (2 propane units @ 80 MMBTU/Hr each)	49.9	0.16 MMBTU/hr propane, 25% capacity @ 5110 hours/yr @ 22.35 lb/1000 gallons
Yard Services Building #2 Fuel Oil Heating System	206.7	0.28 MMBTU/HR #2 fuel oil, 25% capacity @ 5110 hours/yr @ 80.91 lb/1000 gallons
Boiler Chemical Cleaning, Water Side MK1 and MK2, once every 5 years	No Data	Negligible - Boiler tubes are cleaned using 5% HCL solution @ 150 - 180 F. Wastewater is discharged to wastewater treatment for neutralization.
Diesel/#2 Fuel Oil Storage and Vehicle Fueling (2 Tanks @ 8000 gallons each)	No Data	Negligible - Diesel fuel has low volatility
Jet Fuel (JP-4) Storage (4 tanks @ 40,000)	No Data	Negligible - Jet fuel has low volatility
Fly Ash Disposal	34.9	Truck Dumping at on-site landfill 2838 tons@ 0.0123 lb/ton using AP-42 C.13.2.4 U=5.99 m/s M = 0.25%
Fly Ash Silo Dust Collectors (2 silos)	8.4	0.00034 lb/ton for pneumatic cement silo loading @ 24593.4 tons/yr in 2008
Limestone Silo Dust Collector	0.02	0.00034 lb/ton for pneumatic cement silo loading @ 110,000 lb/yr in 2008
Vermiculite Silo Dust Collector	0.3	0.00034 lb/ton for pneumatic cement silo loading @ 1000 ton/yr maximum
PAC Silo Dust Collector	0.0	No PAC in 2008
Ammonia Storage and Distribution Systems (5 tanks + ancillary equipment)	< 100 lb	Fugitive losses from tank loading 8 fl oz (0.36 lb) per rail car load up to 275 loads per year
Fly Ash Tank Unloading (two unloading stations)	302.5	Truck loading from overhead hoppers 24593.4 tons@ 0.0123 lb/ton using AP-42 C.13.2.4 U=5.99 m/s M = 0.25%
Coal Handling / Unloading Systems	303.6	2008 Coal Handling / Unloading Emissions

Notes:
1. Solvent cold cleaning emissions data from Safety Kleen.
2. Slag tank warm-up lines exhaust through individual vents. See Title V application for emission estimates.
3. Gasoline transfer, storage and dispensing emissions estimated from USEPA AP-42 Chapter 5.2
4. Silo emissions estimated from USEPA AP-42 Chapter 11.12
5. Bulk material loading and unloading estimated from UPEAP AP-42 Chapter 13.2.4.

TABLE 2
SUMMARY OF SITE SPECIFIC HAZARDOUS AIR POLLUTANT EMISSION FACTOR DATA

Public Service Company of New Hampshire
Merrimack Station
Bow, New Hampshire

Unit	MK1	MK2
Coal (tons)	274,274	708,469
PM10 Control Efficiency	98.7%	99.5%

Pollutant	MK1 Coal Concentration (ppm)	MK2 Coal Concentration (ppm)	MK1 Emissions (lb)	MK2 Emissions (lb)	MK1 Emission Factor (lb/ton)	MK2 Emission Factor (lb/ton)
Antimony	0.67	0.61	1.4	1.3	5.23E-06	1.83E-06
Arsenic	4.67	6.09	10.0	12.9	3.64E-05	1.83E-05
Beryllium	<1	<1	2.1	2.1	7.80E-06	3.00E-06
Cadmium	<1	<1	2.1	2.1	7.80E-06	3.00E-06
Cobalt	<5	<5	10.7	10.6	3.90E-05	1.50E-05
Chromium	14	16	30.0	34.0	1.09E-04	4.80E-05
Lead	<5	<5	10.7	10.6	3.90E-05	1.50E-05
Manganese	27.5	28.5	58.8	60.6	2.15E-04	8.55E-05
Mercury	86.4	89.9	39.1	117.4	1.42E-04	1.66E-04
Nickel	9.41	10.2	20.1	21.7	7.34E-05	3.06E-05
Selenium	1.95	3.24	4.2	6.9	1.52E-05	9.72E-06
Hydrogen Chloride	923	614	520,572.1	869,999.9	1.90E+00	1.23E+00
Hydrogen Fluoride	149.0	38.6	81,733.7	54,693.8	2.98E-01	7.72E-02

Notes:

1. Coal concentration data is from Merrimack Station annual composite analysis for each unit (see attached analytical results).
2. Emission factor assumes all metals in the coal (except mercury) are transferred to the ash and that fly ash comprises 30% of all ash.
3. Sample calculation: Coal combusted (tons) x 2000 (lb/ton) x concentration (ppm) / (1,000,000) x 30% fly ash proportion x (1 - control efficiency). MK1 (Sb) = 274,274 tons x 2000 lb/ton x 0.67 ppm / 1,000,000 x 30% x (1 - 98.7%) = 1.43 lb
4. Metal compounds are expressed as the parent metal.
5. Mercury emission factors were calculated based on the average of the 2008 - 2009 Method 29 test results for each unit.
6. Acid gas emissions were calculated assuming all of the chloride and fluoride is converted to hydrogen fluoride and hydogen chloride, respectively. Coal concentrations are presentes as chloride and fluoride and emissions are presented \ as hydrogen chloride and hydrogen fluoride, respectively.

TABLE 3
SUMMARY OF HAZARDOUS AIR POLLUTANT EMISSION FACTORS

Public Service Company of New Hampshire
Merrimack Station
Bow, New Hampshire

Pollutant	MK1 Coal (lb/ton)	MK2 Coal (lb/ton)	Emergency Generator (lb/mmBTU)	Turbines (lb/mmBTU)	#2 Oil Boilers (lb/1000 gal)	#2 Boiler Metals (lb/10^{12} BTU)
2,3,7,8-TCDD	1.43E-11	1.43E-11				
1,3-Butadiene	-		<3.91E-05	<1.6E-05	-	-
2,4-Dinitrotoluene	2.80E-07	2.80E-07	-	-	-	-
2-Chloroacetophenone	7.00E-06	7.00E-06	-	-	-	-
5-Methyl chrysene	2.20E-08	2.20E-08	-	-	-	-
Acenaphthene	5.10E-07	5.10E-07	<1.42E-06	-	2.11E-05	-
Acenaphthylene	2.50E-07	2.50E-07	<5.06E-06	-	2.53E-07	-
Acetaldehyde	5.70E-04	5.70E-04	7.67E-04	-	-	-
Acetophenone	1.50E-05	1.50E-05	-	-	-	-
Acrolein	2.90E-04	2.90E-04	<9.25E-05	-	-	-
Anthracene	2.10E-07	2.10E-07	1.87E-06	-	1.22E-06	-
Antimony	5.23E-06	1.83E-06	-	-	-	-
Arsenic	3.64E-05	1.83E-05	-	<1.1E-05	-	4.0
Benz(a)anthracene	-	-	-	-	4.01E-06	-
Benzene	1.30E-03	1.30E-03	9.33E-04	5.50E-05	2.14E-04	-
Benzo(a)anthracene	8.00E-08	8.00E-08	1.68E-06	-	4.01E-06	-
Benzo(a)pyrene	3.80E-08	3.80E-08	<1.88E-07	-	-	-
Benzo(b)fluoranthene	-	-	<9.91E-08	-	-	-
Benzo(b,j,k)fluoranthene	1.10E-07	1.10E-07	-	-	-	-
Benzo(b,k)fluoranthene	-	-	-	-	1.48E-06	-
Benzo(g,h,i)perylene	2.70E-08	2.70E-08	-	-	2.26E-06	-
Benzo(g,h,l)perylene	-	-	<4.89E-07	-	-	-
Benzo(k)fluoranthene	-	-	<1.55E-07	-	-	-
Benzyl chloride	7.00E-04	7.00E-04	-	-	-	-
Beryllium	7.80E-06	3.00E-06	-	<3.1E-07	-	3.0
Biphenyl	1.70E-06	1.70E-06	-	-	-	-
Bis(2-ethylhexyl)phthalate (DEHP)	7.30E-05	7.30E-05	-	-	-	-
Bromoform	3.90E-05	3.90E-05	-	-	-	-
Cadmium	7.80E-06	3.00E-06	-	4.8E-06	-	3.0
Carbon disulfide	1.30E-04	1.30E-04	-	-	-	-
Chlorobenzene	2.20E-05	2.20E-05	-	-	-	-
Chloroform	5.90E-05	5.90E-05	-	-	-	-
Chromium	2.60E-04	2.60E-04	-	1.1E-05	-	3.0
Chromium(VI)	7.90E-05	7.90E-05	-	-	-	-
Chrysene	1.00E-07	1.00E-07	3.53E-07	-	2.38E-06	-
Cobalt	3.90E-05	1.50E-05	-	-	-	-
Cumene	5.30E-06	5.30E-06	-	-	-	-
Cyanide	2.50E-03	2.50E-03	-	-	-	-
Dibenz(a,h)anthracene	-	-	<5.83E-07	-	1.67E-06	-
Dimethyl sulfate	4.80E-05	4.80E-05	-	-	-	-
Ethylbenzene	9.40E-05	9.40E-05	-	-	6.36E-05	-
Ethyl chloride	4.20E-05	4.20E-05	-	-	-	-
Ethylene dibromide	1.20E-06	1.20E-06	-	-	-	-

TABLE 3
SUMMARY OF HAZARDOUS AIR POLLUTANT EMISSION FACTORS

Public Service Company of New Hampshire
Merrimack Station
Bow, New Hampshire

Pollutant	MK1 Coal (lb/ton)	MK2 Coal (lb/ton)	Emergency Generator (lb/mmBTU)	Turbines (lb/mmBTU)	#2 Oil Boilers (lb/1000 gal)	#2 Boiler Metals (lb/10^{12} BTU)
Ethylene dichloride	4.00E-05	4.00E-05	-	-	-	-
Fluoranthene	7.10E-07	7.10E-07	7.61E-06	-	4.84E-06	-
Fluorene	9.10E-07	9.10E-07	2.92E-05	-	4.47E-06	-
Formaldehyde	2.40E-04	2.40E-04	1.18E-03	2.80E-04	3.30E-02	-
Hexane	6.70E-05	6.70E-05	-	-	-	-
Hydrogen Chloride	1.90	1.23	-	-	-	-
Hydrogen fluoride	0.30	0.08	-	-	-	-
Indeno(1,2,3-cd)pyrene	6.10E-08	6.10E-08	<3.75E-07	-	-	-
Indo(1,2,3-cd)pyrene	-	-	-	-	2.14E-06	-
Isophorone	5.80E-04	5.80E-04	-	-	-	-
Lead	3.90E-05	1.50E-05	-	1.4E-05	-	9.0
Manganese	2.15E-04	8.55E-05	-	7.9E-04	-	6.0
Mercury	1.42E-04	1.66E-04	-	1.2E-06	-	3.0
Methyl bromide	1.60E-04	1.60E-04	-	-	-	-
Methyl chloride	5.30E-04	5.30E-04	-	-	-	-
Methyl hydrazine	1.70E-04	1.70E-04	-	-	-	-
Methyl methacrylate	2.00E-05	2.00E-05	-	-	-	-
Methyl tert butyl ether	3.50E-05	3.50E-05	-	-	-	-
Methylene chloride	2.90E-04	2.90E-04	-	-	-	-
Naphthalene	1.30E-05	1.30E-05	8.48E-05	3.50E-05	1.13E-03	-
Nickel	7.34E-05	3.06E-05	-	<4.6E-06	-	3.0
o-Xylene	-	-	-	-	1.09E-04	-
PAH	-	-	-	4.00E-05	-	-
Phenanthrene	2.70E-06	2.70E-06	2.94E-05	-	1.05E-05	-
Phenol	1.60E-05	1.60E-05	-	-	-	-
Propionaldehyde	3.80E-04	3.80E-04	-	-	-	-
Pyrene	3.30E-07	3.30E-07	4.78E-06	-	4.25E-06	-
Selenium	1.52E-05	9.72E-06	-	<2.5E-05	-	15.0
Styrene	2.50E-05	2.50E-05	-	-	-	-
Tetrachloroethylene	4.30E-05	4.30E-05	-	-	-	-
Toluene	2.40E-04	2.40E-04	4.09E-04	-	6.20E-03	-
Vinyl acetate	7.60E-06	7.60E-06	-	-	-	-
Xylenes	3.70E-05	3.70E-05	2.85E-04	-	-	-

Notes:
1. Metal and acid gas emissions rates are from Table 1 - Summary of Site Specific Emission Factor Data.
2. All other data is from USEPA AP-42 Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, 5th Edition, Chapters 1.1, 1.3, 1.5, 3.1, 3.3, and 5.2.
3. "-" indicates that there is no data published in AP-42 for the pollutant and emission source shown.

TABLE 4
SUMMARY OF HAZARDOUS AIR POLLUTANT EMISSIONS FROM SIGNIFICANT ACTIVITIES

Public Service Company of New Hampshire
Merrimack Station
Bow, New Hampshire

Pollutant	Electric Generating Unit 1 (coal)		Electric Generating Unit 2 (coal)		Electric Generating Unit 1 (#2 oil)		Electric Generating Unit 2 (#2 oil)		Combustion Turbine 1 (#1 oil JP-4)		Combustion Turbine 2 (#1 oil JP-4)		Emergency Generator (#2 oil)		Totals	
	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)	Actual Emissions (tons/yr)	Potential Emissions (tons/yr)
Fuel Use:	274,274 tons	425,289 tons	708,469 tons	1,193,078 tons	11,231 gal	14,500,000 gal	14,819 gal	14,500,000 gal	37,107 gal	19,960,000 gal	39,053 gal	19,960,000 gal	151 gal	14,350 gal		
2,3,7,8-TCDD	1.96E-09	3.04E-09	5.07E-09	8.53E-09	-	-	-	-	-	-	-	-	-	-	7.03E-09	1.16E-08
1,3-Butadiene	-	-	-	-	-	-	-	-	4.01E-05	2.16E-02	4.22E-05	2.16E-02	4.13E-07	3.93E-05	8.27E-05	4.32E-02
2,4-Dinitrotoluene	3.84E-05	5.95E-05	9.92E-05	1.67E-04	-	-	-	-	-	-	-	-	-	-	1.38E-04	2.27E-04
2-Chloroacetophenone	9.60E-04	1.49E-03	2.48E-03	4.18E-03	-	-	-	-	-	-	-	-	-	-	3.44E-03	5.66E-03
5-Methyl chrysene	3.02E-06	4.68E-06	7.79E-06	1.31E-05	-	-	-	-	-	-	-	-	-	-	1.08E-05	1.78E-05
Acenaphthene	6.99E-05	1.08E-04	1.81E-04	3.04E-04	1.18E-07	1.53E-04	1.56E-07	1.53E-04	-	-	-	-	1.50E-08	1.43E-06	2.51E-04	7.20E-04
Acenaphthylene	3.43E-05	5.32E-05	8.86E-05	1.49E-04	1.42E-09	1.83E-06	1.87E-09	1.83E-06	-	-	-	-	5.35E-08	5.08E-06	1.23E-04	2.11E-04
Acetaldehyde	7.82E-02	1.21E-01	2.02E-01	3.40E-01	-	-	-	-	-	-	-	-	8.11E-06	7.70E-04	2.80E-01	4.62E-01
Acetophenone	2.06E-03	3.19E-03	5.31E-03	8.95E-03	-	-	-	-	-	-	-	-	-	-	7.37E-03	1.21E-02
Acrolein	3.98E-02	6.17E-02	1.03E-01	1.73E-01	-	-	-	-	-	-	-	-	9.78E-07	9.29E-05	1.42E-01	2.35E-01
Anthracene	2.88E-05	4.47E-05	7.44E-05	1.25E-04	6.85E-09	8.85E-06	9.04E-09	8.85E-06	-	-	-	-	1.98E-08	1.88E-06	1.03E-04	1.89E-04
Antimony	7.17E-04	1.11E-03	6.48E-04	1.09E-03	-	-	-	-	-	-	-	-	-	-	1.36E-03	2.20E-03
Arsenic	5.00E-03	7.75E-03	6.47E-03	1.09E-02	3.14E-06	4.06E-03	4.15E-06	4.06E-03	2.76E-05	1.48E-02	2.90E-05	1.48E-02	-	-	1.15E-02	5.64E-02
Benz(a)anthracene					2.25E-08	2.91E-05	2.97E-08	2.91E-05	-	-	-	-	-	-	5.22E-08	5.81E-05
Benzene	1.78E-01	2.76E-01	4.61E-01	7.76E-01	1.20E-06	1.55E-03	1.59E-06	1.55E-03	1.38E-04	7.41E-02	1.45E-04	7.41E-02	9.86E-06	9.37E-04	6.39E-01	1.20E+00
Benzo(a)anthracene	1.10E-05	1.70E-05	2.83E-05	4.77E-05	2.25E-08	2.91E-05	2.97E-08	2.91E-05	-	-	-	-	1.78E-08	1.69E-06	3.94E-05	1.25E-04
Benzo(a)pyrene	5.21E-06	8.08E-06	1.35E-05	2.27E-05	-	-	-	-	-	-	-	-	1.99E-09	1.89E-07	1.87E-05	3.09E-05
Benzo(b)fluoranthene	-	-	-	-	-	-	-	-	-	-	-	-	1.05E-09	9.95E-08	1.05E-09	9.95E-08
Benzo(b,j,k)fluoranthene	1.51E-05	2.34E-05	3.90E-05	6.56E-05	-	-	-	-	-	-	-	-	-	-	5.41E-05	8.90E-05
Benzo(b,k)fluoranthene	-	-	-	-	8.31E-09	1.07E-05	1.10E-08	1.07E-05	-	-	-	-	-	-	1.93E-08	2.15E-05
Benzo(g,h,i)perylene	3.70E-06	5.74E-06	9.56E-06	1.61E-05	1.27E-08	1.64E-05	1.67E-08	1.64E-05	-	-	-	-	-	-	1.33E-05	5.46E-05
Benzo(g,h,l)perylene	-	-	-	-	-	-	-	-	-	-	-	-	5.17E-09	4.91E-07	5.17E-09	4.91E-07
Benzo(k)fluoranthene	-	-	-	-	-	-	-	-	-	-	-	-	1.64E-09	1.56E-07	1.64E-09	1.56E-07
Benzyl chloride	9.60E-02	1.49E-01	2.48E-01	4.18E-01	-	-	-	-	-	-	-	-	-	-	3.44E-01	5.66E-01
Beryllium	1.07E-03	1.66E-03	1.06E-03	1.79E-03	2.36E-06	3.05E-03	3.11E-06	3.05E-03	7.76E-07	4.18E-04	8.17E-07	4.18E-04	-	-	2.14E-03	1.04E-02
Biphenyl	2.33E-04	3.61E-04	6.02E-04	1.01E-03	-	-	-	-	-	-	-	-	-	-	8.35E-04	1.38E-03
Bis(2-ethylhexyl)phthalate (DEHP)	1.00E-02	1.55E-02	2.59E-02	4.35E-02	-	-	-	-	-	-	-	-	-	-	3.59E-02	5.91E-02
Bromoform	5.35E-03	8.29E-03	1.38E-02	2.33E-02	-	-	-	-	-	-	-	-	-	-	1.92E-02	3.16E-02
Cadmium	1.07E-03	1.66E-03	1.06E-03	1.79E-03	2.36E-06	3.05E-03	3.11E-06	3.05E-03	1.20E-05	6.47E-03	1.27E-05	6.47E-03	-	-	2.16E-03	2.25E-02
Carbon disulfide	1.78E-02	2.76E-02	4.61E-02	7.76E-02	-	-	-	-	-	-	-	-	-	-	6.39E-02	1.05E-01
Chlorobenzene	3.02E-03	4.68E-03	7.79E-03	1.31E-02	-	-	-	-	-	-	-	-	-	-	1.08E-02	1.78E-02
Chloroform	8.09E-03	1.25E-02	2.09E-02	3.52E-02	-	-	-	-	-	-	-	-	-	-	2.90E-02	4.77E-02
Chromium	3.57E-02	5.53E-02	9.21E-02	1.55E-01	2.36E-06	3.05E-03	3.11E-06	3.05E-03	2.76E-05	1.48E-02	2.90E-05	1.48E-02	-	-	1.28E-01	2.46E-01
Chromium(VI)	1.08E-02	1.68E-02	2.80E-02	4.71E-02	-	-	-	-	-	-	-	-	-	-	3.88E-02	6.39E-02
Chrysene	1.37E-05	2.13E-05	3.54E-05	5.97E-05	1.34E-08	1.73E-05	1.76E-08	1.73E-05	-	-	-	-	3.73E-09	3.55E-07	4.92E-05	1.16E-04
Cobalt	5.35E-03	8.29E-03	5.31E-03	8.95E-03	-	-	-	-	-	-	-	-	-	-	1.07E-02	1.72E-02
Cumene	7.27E-04	1.13E-03	1.88E-03	3.16E-03	-	-	-	-	-	-	-	-	-	-	2.60E-03	4.29E-03
Cyanide	3.43E-01	5.32E-01	8.86E-01	1.49E+00	-	-	-	-	-	-	-	-	-	-	1.23E+00	2.02E+00
Dibenz(a,h)anthracene	-	-	-	-	9.38E-09	1.21E-05	1.24E-08	1.21E-05	-	-	-	-	6.16E-09	5.86E-07	2.79E-08	2.48E-05
Dimethyl sulfate	6.58E-03	1.02E-02	1.70E-02	2.86E-02	-	-	-	-	-	-	-	-	-	-	2.36E-02	3.88E-02
Ethylbenzene	1.29E-02	2.00E-02	3.33E-02	5.61E-02	3.57E-07	4.61E-04	4.71E-07	4.61E-04	-	-	-	-	-	-	4.62E-02	7.70E-02
Ethyl chloride	5.76E-03	8.93E-03	1.49E-02	2.51E-02	-	-	-	-	-	-	-	-	-	-	2.06E-02	3.40E-02
Ethylene dibromide	1.65E-04	2.55E-04	4.25E-04	7.16E-04	-	-	-	-	-	-	-	-	-	-	5.90E-04	9.71E-04
Ethylene dichloride	5.49E-03	8.51E-03	1.42E-02	2.39E-02	-	-	-	-	-	-	-	-	-	-	1.97E-02	3.24E-02
Fluoranthene	9.74E-05	1.51E-04	2.52E-04	4.24E-04	2.72E-08	3.51E-05	3.59E-08	3.51E-05	-	-	-	-	8.04E-08	7.64E-06	3.49E-04	6.52E-04
Fluorene	1.25E-04	1.94E-04	3.22E-04	5.43E-04	2.51E-08	3.24E-05	3.31E-08	3.24E-05	-	-	-	-	3.09E-07	2.93E-05	4.48E-04	8.31E-04

TABLE 4
SUMMARY OF HAZARDOUS AIR POLLUTANT EMISSIONS FROM SIGNIFICANT ACTIVITIES

Public Service Company of New Hampshire
Merrimack Station
Bow, New Hampshire

Pollutant	Electric Generating Unit 1 (coal)		Electric Generating Unit 2 (coal)		Electric Generating Unit 1 (#2 oil)		Electric Generating Unit 2 (#2 oil)		Combustion Turbine 1 (#1 oil JP-4)		Combustion Turbine 2 (#1 oil JP-4)		Emergency Generator (#2 oil)		Totals	
	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)	Actual Emissions (tons/yr)	Potential Emissions (tons/yr)
Formaldehyde	3.29E-02	5.10E-02	8.50E-02	1.43E-01	1.85E-04	2.39E-01	2.45E-04	2.39E-01	7.01E-04	3.77E-01	7.38E-04	3.77E-01	1.25E-05	1.19E-03	1.20E-01	1.43E+00
Hexane	9.19E-03	1.42E-02	2.37E-02	4.00E-02	-	-	-	-	-	-	-	-	-	-	3.29E-02	5.42E-02
Hydrogen Chloride	2.60E+02	4.04E+02	4.35E+02	7.33E+02	-	-	-	-	-	-	-	-	-	-	6.95E+02	1.14E+03
Hydrogen fluoride	4.09E+01	6.34E+01	2.73E+01	4.61E+01	-	-	-	-	-	-	-	-	-	-	6.82E+01	1.09E+02
Indeno(1,2,3-cd)pyrene	8.37E-06	1.30E-05	2.16E-05	3.64E-05	-	-	-	-	-	-	-	-	3.96E-09	3.77E-07	3.00E-05	4.97E-05
Indo(1,2,3-cd)pyrene	-	-	-	-	1.20E-08	1.55E-05	1.59E-08	1.55E-05	-	-	-	-	-	-	2.79E-08	3.10E-05
Isophorone	7.95E-02	1.23E-01	2.05E-01	3.46E-01	-	-	-	-	-	-	-	-	-	-	2.85E-01	4.69E-01
Lead	5.35E-03	8.29E-03	5.31E-03	8.95E-03	7.08E-06	9.14E-03	9.34E-06	9.14E-03	3.51E-05	1.89E-02	3.69E-05	1.89E-02	-	-	1.08E-02	7.32E-02
Manganese	2.94E-02	4.56E-02	3.03E-02	5.10E-02	4.72E-06	6.09E-03	6.22E-06	6.09E-03	1.98E-03	1.06E+00	2.08E-03	1.06E+00	-	-	6.38E-02	2.24E+00
Mercury	1.95E-02	3.03E-02	5.87E-02	9.89E-02	2.36E-06	3.05E-03	3.11E-06	3.05E-03	3.01E-06	1.62E-03	3.16E-06	1.62E-03	-	-	7.83E-02	1.38E-01
Methyl bromide	2.19E-02	3.40E-02	5.67E-02	9.54E-02	-	-	-	-	-	-	-	-	-	-	7.86E-02	1.29E-01
Methyl chloride	7.27E-02	1.13E-01	1.88E-01	3.16E-01	-	-	-	-	-	-	-	-	-	-	2.60E-01	4.29E-01
Methyl ethyl Ketone	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00E+00	0.00E+00
Methyl hydrazine	2.33E-02	3.61E-02	6.02E-02	1.01E-01	-	-	-	-	-	-	-	-	-	-	8.35E-02	1.38E-01
Methyl methacrylate	2.74E-03	4.25E-03	7.08E-03	1.19E-02	-	-	-	-	-	-	-	-	-	-	9.83E-03	1.62E-02
Methyl tert butyl ether	4.80E-03	7.44E-03	1.24E-02	2.09E-02	-	-	-	-	-	-	-	-	-	-	1.72E-02	2.83E-02
Methylene chloride	3.98E-02	6.17E-02	1.03E-01	1.73E-01	-	-	-	-	-	-	-	-	-	-	1.42E-01	2.35E-01
Naphthalene	1.78E-03	2.76E-03	4.61E-03	7.76E-03	6.35E-06	8.19E-03	8.37E-06	8.19E-03	8.77E-05	4.72E-02	9.23E-05	4.72E-02	8.96E-07	8.52E-05	6.58E-03	1.21E-01
Nickel	1.01E-02	1.56E-02	1.08E-02	1.83E-02	2.36E-06	3.05E-03	3.11E-06	3.05E-03	1.15E-05	6.20E-03	1.21E-05	6.20E-03	-	-	2.09E-02	5.23E-02
o-Xylene	-	-	-	-	6.12E-07	7.90E-04	8.08E-07	7.90E-04	-	-	-	-	-	-	1.42E-06	1.58E-03
PAH	-	-	-	-	-	-	-	-	1.00E-04	5.39E-02	1.05E-04	5.39E-02	-	-	2.06E-04	1.08E-01
Phenanthrene	3.70E-04	5.74E-04	9.56E-04	1.61E-03	5.90E-08	7.61E-05	7.78E-08	7.61E-05	-	-	-	-	3.11E-07	2.95E-05	1.33E-03	2.37E-03
Phenol	2.19E-03	3.40E-03	5.67E-03	9.54E-03	-	-	-	-	-	-	-	-	-	-	7.86E-03	1.29E-02
Propionaldehyde	5.21E-02	8.08E-02	1.35E-01	2.27E-01	-	-	-	-	-	-	-	-	-	-	1.87E-01	3.07E-01
Pyrene	4.53E-05	7.02E-05	1.17E-04	1.97E-04	2.39E-08	3.08E-05	3.15E-08	3.08E-05	-	-	-	-	5.05E-08	4.80E-06	1.62E-04	3.33E-04
Selenium	2.09E-03	3.23E-03	3.44E-03	5.80E-03	1.18E-05	1.52E-02	1.56E-05	1.52E-02	6.26E-05	3.37E-02	6.59E-05	3.37E-02	-	-	5.68E-03	1.07E-01
Styrene	3.43E-03	5.32E-03	8.86E-03	1.49E-02	-	-	-	-	-	-	-	-	-	-	1.23E-02	2.02E-02
Tetrachloroethylene	5.90E-03	9.14E-03	1.52E-02	2.57E-02	-	-	-	-	-	-	-	-	-	-	2.11E-02	3.48E-02
Toluene	3.29E-02	5.10E-02	8.50E-02	1.43E-01	3.48E-05	4.50E-02	4.59E-05	4.50E-02	-	-	-	-	4.32E-06	4.11E-04	1.18E-01	2.85E-01
Vinyl acetate	1.04E-03	1.62E-03	2.69E-03	4.53E-03	-	-	-	-	-	-	-	-	-	-	3.73E-03	6.15E-03
Xylenes	5.07E-03	7.87E-03	1.31E-02	2.21E-02	-	-	-	-	-	-	-	-	3.01E-06	2.86E-04	1.82E-02	3.02E-02
													Total		7.68E+02	1.26E+03

FirstLight Power Resources

Analysis Report

Mt. Tom Generating Co. LLC
Analytical Laboratory
West Springfield, MA 01089
Phone (413) 214-6541 Fax (413) 214-6842
email-mshah@firstlightpower.com

Sample Number 14527
Station Merrimack
Date Received 2/26/09
As Fired
Air Drying Loss 0.00%

Report Date 3/20/09
Work Order 09-0338
Source Identification
MK2 Yearly Composite 2008

Proximate/Ultimate Analysis

Parameter	Date Tested	As Received	Dry	Air Dried
Moisture		1.23%		1.23%
Ash,%		7.55	7.64	7.55
BTU/Lb		13750	13900	13750
Sulfur, %		1.47	1.49	1.47
Carbon,%		79	79.98	79
Hydrogen,%		5.11	5.17	5.11
Nitrogen,%		1.36	1.38	1.36
Oxygen,%		4.28	4.33	4.28
Hg-Mercury Total ug/Kg		89.9	91.02	89.9

Comments

Madhu Shah, Laboratory Supervisor **Date**

Mass Certification - MA-00071
Conn Certification - PH-0520

FirstLight Power Resources

Analysis Report

Mt. Tom Generating Co. LLC
Analytical Laboratory
West Springfield, MA 01089
Phone (413) 214-6541 Fax (413) 214-6842
email-mshah@firstlightpower.com

Sample Number 14633
Station Merrimack
Date Received 2/26/09
As Fired
Air Drying Loss 0.00%

Report Date
Work Order 09-0338
Source Identification
MK1 Yearly Composite 2008

Proximate/Ultimate Analysis

Parameter	Date Tested	As Received	Dry	Air Dried
Moisture		1.05%		1.05%
Ash,%		7.24	7.32	7.24
BTU/Lb		13903	14100	13900
Sulfur, %		1.58	1.6	1.58
Carbon,%		80.3	81.15	80.3
Hydrogen,%		5.07	5.12	5.07
Nitrogen,%		1.3	1.31	1.3
Oxygen,%		3.46	3.5	3.46
Hg-Mercury Total ug/Kg		86.4	87.32	86.4

Comments

Madhu Shah, Laboratory Supervisor — Date

Mass Certification - MA-00071
Conn Certification - PH-0520

Mt.Tom Generating Co. LLC Analytical Laboratory

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FirstLight Power Resources

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Report Date March 20, 2009

Customer	Contact	Laboratory Supervisor	eMail
Merrimack	K. Kroh	Madhu Shah	mshah@firstlightpower.com

Sample Description
Analysis of Coal Samples

Samples Analyzed

Enclosed are Report No(s): 14525, 14526

Thank you for your business

Madhu Shah, Laboratory Supervisor **Date**

Sample Analysis

Work Order 09-0295

Sample	Description	Source	Taken/Time	Received
14525	MK2 Yearly Composite 2008	Merrimack		2/26/09

Parameter		Results		MDL	Method	Analyzed/Time	Tech
Ag-Silver Total	Less Than	10.0	mg/kg	10.00	EPA 200.7	03/16/09	dfp
Al2O3		1.66	%	0.10	EPA 200.7	03/16/09	dfp
As-Arsenic Total		6.09	mg/kg	0.50	EPA 200.9	03/18/09	dfp
Ba-Barium Total		64.00	mg/kg	1.00	EPA 200.7	03/16/09	dfp
Be-Beryllium Total	Less Than	1.00	mg/kg	1.00	EPA 200.7	03/16/09	dfp
CaO		0.30	%	0.10	EPA 200.7	03/16/09	dfp
Cd-Cadmium Total	Less Than	1.00	mg/kg	1.00	EPA 200.7	03/16/09	dfp
Co-Cobalt Total	Less Than	5.00	mg/kg	5.00	EPA 200.7	03/16/09	dfp
Cr-Chromium Total		16.00	mg/kg	5.00	EPA 200.7	03/16/09	dfp
Cu-Copper Total		7.20	mg/kg	2.00	EPA 200.7	03/16/09	dfp
Fe2O3		1.29	%	0.10	EPA 200.7	03/16/09	dfp
Hg-Mercury Total		89.9	ug/kg	50.00	EPA 245.1	03/10/09	dfp
K2O		0.15	%	0.10	EPA 200.7	03/16/09	dfp
MgO		985	mg/kg	10.00	EPA 200.7	03/16/09	dfp
Mn-Manganese Total		28.50	mg/kg	5.00	EPA 200.7	03/16/09	dfp
Na2O		639	mg/kg	10.00	EPA 200.7	03/16/09	dfp
Ni-Nickel Total		10.20	mg/kg	5.00	EPA 200.7	03/16/09	dfp
P2O5		205	mg/kg	10.00	EPA 200.7	03/16/09	dfp
Pb-Lead Total	Less Than	5.00	mg/kg	5.00	EPA 200.7	03/16/09	dfp
Sb-Antimony Total		0.61	mg/kg	0.50	EPA 200.9	03/18/09	dfp
Se-Selenium Total		3.24	mg/kg	0.50	EPA 200.9	03/18/09	dfp
SiO2-Silica -Total		3.61	%	0.50	EPA 200.7	03/16/09	dfp
SrO		85.40	mg/kg	10.00	EPA 200.7	03/16/09	dfp
TiO2		811	mg/kg	10.00	EPA 200.7	03/16/09	dfp
V-Vanadium Total		23.10	mg/kg	10.00	EPA 200.7	03/16/09	dfp
Zn-Zinc Total		17.30	mg/kg	1.00	EPA 200.7	03/16/09	dfp
Chlorine		614	mg/kg	100.00	ASTM D-808	03/12/09	sjr
Fluorine		38.6	mg/kg	2.00	SM 4500-F-C	03/12/09	sjr
SO3		3.67	%	0.50	ASTM D-4239	03/06/09	mps

Sample Analysis

Work Order 09-0295

Sample	Description	Source	Taken/Time	Received
14526	MK1 Yearly Composite 2008	Merrimack		2/26/09

Parameter		Results		MDL	Method	Analyzed/Time	Tech
Ag-Silver Total	Less Than	10.0	mg/kg	10.00	EPA 200.7	03/16/09	dfp
Al2O3		1.55	%	0.10	EPA 200.7	03/16/09	dfp
As-Arsenic Total		4.67	mg/kg	0.50	EPA 200.9	03/18/09	dfp
Ba-Barium Total		85.00	mg/kg	1.00	EPA 200.7	03/16/09	dfp
Be-Beryllium Total	Less Than	1.00	mg/kg	1.00	EPA 200.7	03/16/09	dfp
CaO		0.37	%	0.10	EPA 200.7	03/16/09	dfp
Cd-Cadmium Total	Less Than	1.00	mg/kg	1.00	EPA 200.7	03/16/09	dfp
Co-Cobalt Total	Less Than	5.00	mg/kg	5.00	EPA 200.7	03/16/09	dfp
Cr-Chromium Total		14.00	mg/kg	5.00	EPA 200.7	03/16/09	dfp
Cu-Copper Total		7.57	mg/kg	2.00	EPA 200.7	03/16/09	dfp
Fe2O3		1.16	%	0.10	EPA 200.7	03/16/09	dfp
Hg-Mercury Total		86.4	ug/kg	50.00	EPA 245.1	03/10/09	dfp
K2O		0.13	%	0.10	EPA 200.7	03/16/09	dfp
MgO		0.11	%	0.10	EPA 200.7	03/16/09	dfp
Mn-Manganese Total		27.50	mg/kg	5.00	EPA 200.7	03/16/09	dfp
Na2O		640	mg/kg	10.00	EPA 200.7	03/16/09	dfp
Ni-Nickel Total		9.41	mg/kg	5.00	EPA 200.7	03/16/09	dfp
P2O5		166	mg/kg	10.00	EPA 200.7	03/16/09	dfp
Pb-Lead Total	Less Than	5.00	mg/kg	5.00	EPA 200.7	03/16/09	dfp
Sb-Antimony Total		0.67	mg/kg	0.50	EPA 200.9	03/18/09	dfp
Se-Selenium Total		1.95	mg/kg	0.50	EPA 200.9	03/18/09	dfp
SiO2-Silica -Total		3.26	%	0.50	EPA 200.7	03/16/09	dfp
SrO		110	mg/kg	0.10	EPA 200.7	03/16/09	dfp
TiO2		777	mg/kg	10.00	EPA 200.7	03/16/09	dfp
V-Vanadium Total		20.90	mg/kg	10.00	EPA 200.7	03/16/09	dfp
Zn-Zinc Total		14.40	mg/kg	1.00	EPA 200.7	03/16/09	dfp
Chlorine		923	mg/kg	100.00	ASTM D-808	03/12/09	sjr
Fluorine		149	mg/kg	2.00	SM 4500-F-C	03/12/09	sjr
SO3		3.94	%	0.50	ASTM D-4239	03/06/09	mps