



September 7, 2007

The Northeast Utilities System

Mr. Robert R. Scott, Director
Air Resources Division
NH Dept. of Environmental Services
29 Hazen Drive, PO Box 95
Concord, NH 03302-0095

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SEP 10 2007

Public Service Company of New Hampshire
Baseline Mercury Input Report

AIR RESOURCES DIVISION

Dear Mr. Scott:

As required by RSA 125-O:14, III(a), Public Service Company of New Hampshire (PSNH) submits, for verification and approval, the following baseline mercury input report, including calculations used to determine the baseline mercury input and mercury content data for coals used traditionally at each affected source.

Baseline Mercury Input

As defined by RSA 125-O:12, III, "Baseline mercury input" means the total annual mercury input found in the coal used by all of the affected sources, calculated in accordance with RSA 125-O:14, I." Calculated in accordance with RSA 125-O:14, I.(a), the baseline mercury input is pounds. Pursuant to RSA 125-O:14, I.(a), the sum of annual input pound averages from each affected source shall equal the baseline mercury input. The annual input averages from each affected source are provided below. As required by RSA 125-O:14, I.(a), the average mercury content of the coal was multiplied by the average annual throughput of coal for the period 2003, 2004, and 2005 (average tons of coal combusted per year) for each respective affected source to yield the average pounds of mercury input per year into each affected source. The average mercury content of the coal in pounds of mercury per ton of coal and average annual throughput of coal for each affected source are also provided below.

	Average Hg Content of Coal (lbs/ton)	Average Annual Throughput of Coal (tons/yr)	Annual Hg Input Average (lbs)
MK1	0.000207	352,320	73
MK2	0.000259	826,927	214
SR4	0.000081	154,766	13
SR5	0.000081	159,815	13
SR6	0.000081	159,693	13
		Baseline Hg Input (lbs)	326

Baseline Mercury Input Calculation

PSNH calculated the baseline mercury input in accordance with RSA 125-O:14, I.(a), as follows:

Baseline mercury input = sum of annual input average from each affected source

Annual input average = Hg content of coal \times average annual coal throughput

Average Mercury Content of Coal

The average mercury content of coal for each the units was calculated using twelve months (August 2006 through July 2007) of mercury analytical data supplied to PSNH by its fuel suppliers. The average mercury content expressed in pounds of mercury input per ton of coal was determined using a weighted average of the average monthly mercury content consistent with the monthly quantity of fuel burned. In months that multiple deliveries of fuel occurred, an average of the mercury content data was used. For Merrimack Station Unit 1, which traditionally uses a 2/1/1 blend of coal, the monthly mercury content average was calculated using the 50% high sulfur / 25% mid sulfur / 25% low sulfur percentages to determine the average monthly mercury content of the blend. For Merrimack Station Unit 2, PSNH determined the monthly mercury content average based on 100% Bailey, its traditional fuel. The average mercury content was then calculated using a weighted average of the monthly mercury to reflect the corresponding monthly fuel usage. For Schiller Station, which traditionally uses a homogeneous blend of South American coals, a monthly average was calculated based on a simple average of the mercury content of the fuels with a weighted average of monthly fuel burned used to calculate the average mercury content.

PSNH calculated the average mercury content of coal using analytical data provided to PSNH by its fuel suppliers following an in depth analysis of all available analytical data including data provided by fuel suppliers, on-site composite samples, and samples taken during stack testing. Analytical data from all data sets are enclosed for your review, with the exception of samples taken during stack testing at Merrimack Station which is undergoing final quality assurance verification by ADA-ES. An analysis of the enclosed data indicates that while there is some variability in the mercury content, the average mercury content of the coal is consistent and within a statistically valid range. The calculated average mercury content of coal, as well as alternative calculations, is enclosed for your review.

Coal Sampling

As required by RSA 125-O:14, PSNH conducted a fuel sampling and analysis program consisting of monthly representative samples of coals traditionally used at each affected source. Consistent with PSNH's Baseline Testing Plan and the agreement between representatives of PSNH and DES ARD reached during a December 12, 2006 meeting, an analysis of the mercury, chlorine and sulfur content is conducted on each fuel shipment delivered to Merrimack and Schiller Stations. The analysis is conducted using ASTM methods D6722-01 (2006) and ASTM D3684-01 (2006). Analytical data for each shipment is provided to PSNH by all fuel suppliers.

As confirmed by Jack Glenn of DES ARD during the December 12, 2006 meeting, this sampling and analysis approach is consistent with the fuel sampling and analysis program undertaken by PSNH to comply with the monthly fuel sampling requirements contained in RSA 125-O:4 (2002) which was previously approved by DES ARD. It is the most extensive, accurate, and consistent sampling approach available. The sampling of each shipment is conducted using appropriate ASTM methods established for the specific shipment type. Sampling locations, sampling equipment, sampling frequency are contained in the ASTM procedures. The ASTM sampling procedures are audited periodically for quality assurance.

This sampling and analysis approach is the only approach that maintains commercial accuracy and eliminates data gaps which occur during the months when trial or test coal blends are being burned. This sampling approach also prevents the potential bias of on-site intermittent sampling while allowing the on-going testing programs to continue. It is also the only approach that guarantees a monthly representative sample of coals traditionally burned during the twelve month period required by RSA 125-O 14 (August 2006 through July 2007) given the on-going, long-term Field Testing of Advanced Mercury Control Technology Research and Development Project at Merrimack Station. Lastly, this sampling and analysis approach results in a significant amount of historical data which can be used for comparison and validation purposes in the calculation of baseline mercury input.

In addition to the analytical data for each shipment provided by all fuel suppliers, PSNH's analysis of the mercury content of coal included analytical data derived from on-site monthly composite samples collected at Schiller Station. The collection of additional on-site composite samples provides supplementary data for purposes of analysis, comparison, and validation. This additional on-site composite sampling was viable at Schiller Station given the on-going, continuous use of coals used traditionally. Similar on-site sampling was not feasible at Merrimack Station given the intricate fuel blending required at Merrimack Station and the use of test coal blends during the on-going, long-term Field Testing of Advanced Mercury Control Technology Research and Development Project.

In addition to the fuel analytical data for each shipment and additional on-site sampling data from Schiller Station, PSNH's analysis also included data from coal samples taken from each of the units which correspond with stack testing conducted pursuant to RSA 125-O:14, II.(a). Fuel sampling during stack testing is routinely required during all stack testing for quality assurance/quality control purposes. The on-site coal samples taken during stack testing provide supplementary data which can be used to compare and validate the mercury content of fuel as determined using analytical data provided to PSNH by its fuel suppliers.

Coals Used Traditionally

Coals used traditionally at Merrimack and Schiller Stations include eastern bituminous and South American bituminous coals. As discussed in depth during the December 12, 2006 meeting, Merrimack Unit 1 has traditionally used a 2/1/1 blend of 50% high sulfur coal, 25% Bailey (mid-sulfur), and 25% South American (low-sulfur) coal. Merrimack Unit 2 has traditionally used 100% Bailey; and Schiller has traditionally used South American (low-sulfur) bituminous coal. Though the Merrimack units were originally designed and burned higher sulfur coals, prior to the implementation of the NH Acid Rain Act requirements and the federal Title IV Acid Rain requirements, Merrimack Station's two units began burning lower sulfur test coals and blends. The station has traditionally used the 2/1/1 blend (as described above) and 100% Bailey on Merrimack Unit 1 and Merrimack Unit 2, respectively, since that time. The definition of "coals used traditionally" is identical and consistent with the coals traditionally used by PSNH since the implementation of state and federal SO₂ emissions reductions requirements.

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Pursuant to RSA 125-O:14, the average mercury content of coal used traditionally by each affected source has been analyzed and determined for use in the calculating of average pounds of mercury input per year into each affected source and baseline mercury input.

Average Annual Throughput of Coal

The average annual throughput of coal for each affected source was calculated using annual throughput (tons per year) in 2003, 2004, and 2005. Annual throughput and average annual throughput of coal for each affected source is as follows:

	Annual Throughput of Coal (tons per year)				
	MK1	MK2	SR4	SR5	SR6
2003	363,074	768,969	151,299	154,756	150,286
2004	339,021	841,129	155,695	166,809	163,842
2005	354,866	870,803	157,304	157,879	164,952
Average Annual Throughput	352,320	826,967	154,766	159,815	159,693

The above report and enclosed data demonstrates that PSNH has satisfied the requirements contained in RSA 125-O:14, I.(a) and III.(a). PSNH understands that, as required by RSA 125-O:13, II, total mercury emissions from the affected sources shall be at least 80 percent less on an annual basis than the baseline mercury input, as defined in RSA 125-O:12, III, beginning on July 1, 2013. Compliance with this statutory requirement will require total mercury emissions from the affected sources are no more than 65 pounds per year, on an annual basis, beginning on July 1, 2013.

I would be happy to meet with you and representatives of DES ARD following your review of the enclosed report and analytical data. Please contact me at 634-2851 or Laurel Brown, Senior Environmental Analyst – Generation, at 634-2331 if you would like to schedule a meeting or require additional information relative to PSNH's analysis and calculation of baseline mercury input.

Sincerely,



William H. Smagula, P.E.
Director – Generation

Enclosure: HB1673 Baseline Mercury Input (3 pages)

Average mercury content of Monthly Fuel Samples

	MK1		MK2		SR4	
	lbs Hg per tons Coal	0.000170	lbs Hg per tons Coal	0.000252	lbs Hg per tons Coal	0.000144
2006 August	0.000170	0.000252	0.000144	0.000252	0.000144	0.000144
September	0.000170	0.0002807	0.00008	0.0002807	0.00008	0.00008
October	0.000154	0.000249	0.000065	0.000249	0.000065	0.000065
November	0.000144	0.000259	0.000058	0.000259	0.000058	0.000058
December	0.000181	0.0002205	0.000068	0.0002205	0.000068	0.000068
2007 January	0.000233	0.0003	0.000068	0.0003	0.000068	0.000068
February	0.000227	0.0001733	0.000046	0.0001733	0.000046	0.000046
March	0.000156	0.000276	0.000016	0.000276	0.000016	0.000016
April	0.000160	0.000268	0.000076	0.000268	0.000076	0.000076
May	0.000171	0.000246	0.000182	0.000246	0.000182	0.000182
June	0.000253	0.0002677	0.000078	0.0002677	0.000078	0.000078
July	0.000419	0.0002803	0.000074	0.0002803	0.000074	0.000074
12 month average (Lb Hg/ ton Coal)	0.000208	0.000259	0.000081	0.000259	0.000081	0.000081

Average pounds of mercury input per Year

	Average Hg Content of Coal (lbs/ton)	Average Annual Throughput of Coal (tons /yr)	Annual Hg Input Average (lbs)
Merrimack 1	0.000208	352,320	73,229
Merrimack 2	0.000259	826,967	214,008
Schiller 4	0.000081	154,766	12,579
Schiller 5	0.000081	159,815	12,989
Schiller 6	0.000081	159,693	12,980
Baseline mercury input (lbs)			326

IS THIS accurate?

2006	August	Hg ppm	Merrimack Unit 1				Merrimack Unit 2			Schiller 4						
			Total Coal (tons)	High Sulfur 50%	Bailey 25%	South American 25%	lbs Hg per Mo	lbs Hg per Mo	lbs Hg per Mo	Total Coal	South American	lbs Hg per Mo	Lbs Hg per tons Coal			
			34,161	0.092	0.126	0.029	5.790	0.000170	96,238	0.126	24.251976	0.000252	11,944	0.072	1.719936	0.000144
	September		4,801	0.080	0.140	0.040	0.817	0.000170	69,673	0.140	19.554889	0.0002607	12,237	0.040	1.05896	0.00008
	October		27,517	0.075	0.125	0.033	4.224	0.000154	92,176	0.125	22.951824	0.000249	4,662	0.033	0.30303	0.000065
	November		28,916	0.065	0.130	0.029	4.171	0.000144	91,964	0.130	23.818676	0.000259	6,583	0.029	0.381814	0.000058
	December		29,442	0.109	0.110	0.034	5.325	0.000181	76,279	0.110	16.81952	0.0002205	14,868	0.034	0.996156	0.000067
	2007 January		32,573	0.141	0.150	0.034	7.590	0.000233	92,454	0.150	27.7362	0.0003	15,394	0.034	1.046792	0.000068
	February		26,943	0.172	0.087	0.023	6.111	0.000227	64,351	0.087	11.152028	0.0001733	15,180	0.023	0.69828	0.000046
	March		28,874	0.083	0.138	0.008	4.504	0.000156	94,336	0.138	26.036736	0.000276	13,174	0.008	0.210784	0.000016
	April		31,333	0.074	0.134	0.038	5.013	0.000160	49,307	0.134	13.214276	0.000268	14,228	0.038	1.081328	0.000076
	May		33,359	0.088	0.123	0.043	5.704	0.000171	13,150	0.123	3.2349	0.000246	14,889	0.091	2.709798	0.000182
	June		29,329	0.167	0.134	0.039	7.432	0.000253	83,669	0.134	22.395402	0.0002677	14,737	0.039	1.149486	0.000078
	July		34,065	0.330	0.140	0.037	14.259	0.000419	91,622	0.140	25.680338	0.0002808	11,275	0.037	0.83435	0.000074
	Annual Burn		341,313				70.942	0.000208	915,219		236.85	0.0002588	150,171		12.19	0.000081

High Sulfur Fuel : Loveridge, Blackville, Nelms, Emerald
 South American Fuels: Merrimack - Mina Norte, Paso Diablo
 Schiller- Cucuta, Mina Norte, CDC Jagua, Paso Diablo

(1) No August Shipment - used latest prior delivery
 (2) No May Shipment- used latest prior delivery

Schiller Station - mercury content of monthly fuel samples data analysis

Schiller Unit 4 August 2006 - July 2007			
Mercury Data (PPM)	Shipment Data	Composite Data (1)	Shipment data w/ Stack Test Samples (2)
Aug-06	0.072	0.030	0.072
Sep-06	0.040	0.047	0.040
Oct-06	0.033	0.033	0.033
Nov-06	0.029	0.047	0.029
Dec-06	0.034	0.096	0.034
Jan-07	0.034	0.106	0.034
Feb-07	0.023	0.042	0.023
Mar-07	0.008	0.031	0.008
Apr-07	0.038	0.038	0.027
May-07	0.091	0.056	0.073
Jun-07	0.039	0.070	0.089
Jul-07	0.037	0.078	0.037
Average	0.040	0.056	0.042

Note 1: Composite Data includes substitution shipment data to fill a data gap for analysis purposes. (Oct 06, Apr 07)

Note 2: Stack test samples include shipment data for months when no stack tests occurred. (Apr, May, Jun 07)