28 October 2011

Mr. Richard A. Licht, Director
Rhode Island Department of Administration
One Capitol Hill
Providence, RI 02908-5890

Dear Mr. Licht:

The Department of Environmental Management, Office of Air Resources, has reviewed and approved your application for the installation of fuel burning equipment and air pollution control equipment at the Eleanor Slater Hospital - Zambarano Unit located at 2155 Wallum Lake Road, Pascoag, RI.

Based on the representations made in this minor source permit application, the Office of Air Resources has determined that Emissions Cap No. 110-2009 issued 3 July 2009 will need to be revised. Please be advised that until your emissions cap is revised, the quantity of No. 6 fuel oil combusted in the two existing boilers shall be limited to 750,000 gallons or less for any consecutive 12 month period. Modifications of an emissions cap are subject to public comment. We will prepare a draft emissions cap and provide you a copy for your review and comment prior to publishing public notice.

Enclosed is a minor source permit issued pursuant to our review of your application (Approval Nos. 2135 & 2136).

If there are any questions concerning this permit, please contact me at 401-222-2808, extension 7110.

Sincerely,

Ruth A. Gold
Principal Air Quality Specialist
Office of Air Resources

cc: Pascoag Building Official
John Hinckley – RSG
Paul Grisafi – Chevron
Barbara Cesaro – OER
Susan Ferreira - DOA

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR RESOURCES

MINOR SOURCE PERMIT

STATE OF RHODE ISLAND, DEPARTMENT OF ADMINISTRATION
Eleanor Slater Hospital - Zambarano Unit

APPROVAL NOs. 2135 & 2136

Pursuant to the provisions of Air Pollution Control Regulation No. 9, this minor source permit is issued to:

State of Rhode Island, Department of Administration

For the following:

Installation of a Messersmith Combustor and a 200 HP fire tube Hurst boiler Model No. N65 1300 (Approval No. 2135). The fuel burning equipment shall be fired with wood chips. The installation includes an electrostatic precipitator (ESP) to control emissions of particulate matter (Approval No. 2136).

Located at: *Eleanor Slater Hospital - Zambarano Unit, Power Plant Building*

2090 Wallum Lake Road, Pascoag

This permit shall be effective from the date of its issuance and shall remain in effect until revoked by or surrendered to the Department. This permit does not relieve *Eleanor Slater Hospital - Zambarano Unit* **from compliance with applicable state and federal air pollution control rules and regulations. The design, construction and operation of this equipment shall be subject to the attached permit conditions and emission limitations.**

Douglas L. McVay, Acting Chief
Office of Air Resources

Date of issuance

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR RESOURCES

Permit Conditions and Emission Limitations

State of Rhode Island, Department of Administration
Eleanor Slater Hospital - Zambarano Unit

APPROVAL NOs. 2135 & 2136

A. Emission Limitations – The following emission limitations are applicable to the Messersmith 200-HP firetube boiler, capable of burning wood chips. The maximum heat input capacity of this boiler shall be 8.56 million BTUs per hour while burning wood chips having a heat content of 5,013 BTUs per pound.

1. Nitrogen Oxides (as nitrogen dioxide (NO_2))

   The emission rate of nitrogen oxides discharged to the atmosphere from the boiler shall not exceed 0.220 lb per million BTU heat input or 1.88 lb/hr, whichever is more stringent.

2. Carbon Monoxide (CO)

   The emission rate of carbon monoxide discharged to the atmosphere from the boiler shall not exceed 0.180 lb per million BTU heat input or 1.54 lb/hr, whichever is more stringent.

3. Sulfur Dioxide (SO_2)

   The emission rate of sulfur dioxide discharged to the atmosphere from the boiler shall not exceed 0.025 lb per million BTU heat input or 0.21 lb/hr, whichever is more stringent.

4. Particulate Matter (as PM_{10})

   The emission rate of particulate matter discharged to the atmosphere from the boiler shall not exceed 0.100 lb per million BTU heat input or 0.86 lb/hr, whichever is more stringent.

5. Particulate Matter (as $PM_{2.5}$)

   The emission rate of particulate matter discharged to the atmosphere from the boiler shall not exceed 0.060 lb per million BTU heat input or 0.51 lb/hr, whichever is more stringent.

6. Total Nonmethane Hydrocarbons (NMHC)

   The emission rate of total nonmethane hydrocarbons discharged to the atmosphere from the boiler shall not exceed 0.017 lb per million BTU heat input or 0.15 lb/hr, whichever is more stringent.

7. Listed Toxic Air Contaminants

   The emissions of air contaminants discharged to the atmosphere from the wood-fired boiler shall not exceed the limitations in Table 1. These limitations were established to ensure that emissions from this facility do not exceed any of the Acceptable Ambient Levels (AALs) listed in Air Pollution Control Regulation No. 22. The limitations shown in pounds per year are calculated on a 12-month rolling basis.

8. Particulate emissions routed to the ESP shall be reduced by 87% or greater, before discharge to the atmosphere.

9. Visible emissions from the boiler exhaust flue shall not exceed 10% opacity (6-minute average).

B. Operating Requirements

1. The maximum firing rate of the boiler shall not exceed 1,708 pounds per hour of wood chips adjusted to 40% moisture content.

2. The owner/operator shall limit the total quantity of wood chips burned in the wood-fired boiler to 7,483 tons or less, on a wet as-fired basis, in any consecutive 12-month period.

3. The combined quantity of No. 6 fuel oil combusted in the 500-HP Cleaver Brooks boiler and in the 500-HP York Shipley boiler shall not exceed 140 gallons per hour. The sulfur content of the No. 6 fuel oil shall not exceed 1.0 percent by weight.

4. The combined quantity of No. 6 fuel oil combusted in the 500-HP Cleaver Brooks boiler and in the 500-HP York Shipley boiler shall be limited to 750,000 gallons or less, for any consecutive 12 month period.

5. Air contaminants generated from the wood-fired boiler shall be captured, contained, and routed to the electrostatic precipitator (ESP) for treatment prior to discharge to the atmosphere.

6. The ESP shall be in operation whenever the wood-fired boiler is in operation.

7. There shall be no bypassing of the ESP during times when air contaminants are being discharged to the device.

C. Continuous Monitors

1. Continuous emission monitoring equipment shall be installed, operated and maintained for opacity when the boiler is operating.

2. The secondary voltage and amperage of the ESP shall be monitored continuously. The ESP shall be equipped with a display for the secondary voltage and amperage. The owner/operator shall record the secondary voltage and amperage of the ESP a minimum of once per day. The date, time and measurement shall be recorded.

3. Fuel oil firing rates for the 500-HP Cleaver Brooks boiler and the 500-HP York Shipley boiler shall be continuously measured and recorded. The monitoring system shall sound an alarm if the combined quantity of No. 6 fuel oil combusted in the 500-HP Cleaver Brooks boiler and in the 500-HP York Shipley boiler exceeds 140 gallons per hour.

D. Stack Testing

1. Within 180 days of startup of the boiler, performance testing shall be conducted to demonstrate compliance with the emission limitations for nitrogen oxides, carbon monoxide, sulfur dioxide, PM_{10}, $PM_{2.5}$ and total nonmethane hydrocarbons. Additionally testing shall be conducted to measure emissions of the following listed toxic air contaminants for comparison to the emission rates used in the air quality modeling: acetaldehyde, acrolein, arsenic, benzene, beryllium, cadmium, chlorine, hexavalent chromium, cobalt, formaldehyde, hydrogen chloride, lead, manganese, naphthalene, nickel, phosphorus, polycyclic organic matter, and vanadium.

2. A stack testing protocol shall be submitted to the Office of Air Resources for review at least 60 days prior to the performance of any stack tests. The owner/operator shall provide the Office of Air Resources at least 60 days prior notice of any stack test.

3. All test procedures used for stack testing shall be approved by the Office of Air Resources prior to the performance of any stack tests.

4. The owner/operator shall install any and all test ports or platforms necessary to conduct the required stack testing, provide safe access to any platforms and provide the necessary utilities for sampling and testing equipment.

5. All testing shall be conducted under operating conditions deemed acceptable and representative for the purpose of assessing compliance with the applicable emissions limitations.

6. A final report of the results of stack testing shall be submitted to the Office of Air Resources no later than 60 days following completion of testing.

7. All stack testing must be observed by the Office of Resources or its authorized representatives to be considered acceptable, unless the Office of Air Resources provides authorization to the owner/operator to conduct the stack testing without an observer present.

E. Combustion Efficiency Testing

1. The owner/operator shall perform combustion efficiency tests on the boiler by measuring the concentrations of carbon dioxide (CO_2) and carbon monoxide (CO) in the exhaust gas. Testing shall be performed each calendar quarter of operation.

2. The CO_2 and CO concentrations may be on a wet or dry basis as long as they are both on the same basis. Any instruments and/or equipment used for testing, such as a portable combustion analyzer, shall be calibrated and maintained in accordance with the manufacturer's recommendations.

3. The owner/operator shall calculate and record the combustion efficiency of the boiler each time testing of the boiler exhaust gas is conducted to determine the concentrations of CO_2 and CO.

4. The combustion efficiency shall be calculated using the following equation:

$$CE\,(\%) = \frac{CO_2}{CO_2 + CO} \times 100$$

where:

CE = combustion efficiency
CO_2 = % by volume of CO_2 in the exhaust gas
CO = % by volume of CO in the exhaust gas

5. The owner/operator shall initiate corrective actions if the percent combustion efficiency value calculated by the equation above is less than 99 percent. Combustion efficiency will be re-tested until the percent combustion efficiency equals or exceeds 99 percent.

F. Record Keeping and Reporting

1. The owner/operator shall on a monthly basis, no later than 5 days the first of the month, determine and record the total quantity of wood chips combusted in the boiler. This requirement can be met with fuel delivery records. The owner/operator can request approval of an alternative method from the Director.

The owner/operator shall keep records of this determination and provide such records to the Office of Air Resources upon request.

2. The owner/operator shall notify the Office of Air Resources, in writing within 15 days, whenever the total quantity of wood chips combusted in the boiler exceeds 7,483 tons, on a wet as-fired basis, in any consecutive 12-month period.

3. The owner/operator shall maintain copies of all wood fuel delivery records and these copies shall be made accessible for review by the Office of Air Resources or its authorized representative and EPA. These records shall include a certified statement, signed by the owner/operator of the facility, that the records represent all of the fuel combusted in the boiler.

4. The owner/operator shall maintain records of the results of combustion efficiency testing conducted on the boiler. These records shall include the test date, identification of boiler tested, a measurement of the load on the boiler (such as fuel feed rate or hot water production rate), the concentrations of oxygen, carbon monoxide and carbon dioxide in the exhaust gas as well as the combustion efficiency, calculated according to condition E.4 of this permit.

5. The owner/operator shall on a monthly basis, no later than 5 days the first of the month, determine and record the total quantity of No. 6 fuel oil combusted in the two oil-fired boilers. The owner/operator shall keep records of this determination and provide such records to the Office of Air Resources upon request.

6. The owner/operator shall notify the Office of Air Resources, in writing within 15 days, whenever the total quantity of No. 6 fuel oil combusted in the two oil fired boilers exceeds 750,000 gallons, in any consecutive 12-month period.

7. The owner/operator shall develop and implement an operation and maintenance (O&M) plan for the wood-fired boiler prior to start up of the wood-fired boiler. The O&M plan shall include, but not be limited to:

    a. Descriptions of routine maintenance and inspection procedures;

    b. A description of the procedure for and frequency of ash removal from the boiler and the particulate matter control device; and,

    c. Provisions for maintaining records of maintenance and inspection procedures, including both routine activities and actions taken in response to observations of low combustion efficiency.

    The O&M plan shall be present at the facility at all times and shall be made available to representatives of the Office of Air Resources upon request. The owner/operator shall revise this plan at the Office of Air Resources' request or

as the owner/operator deems necessary based on operating experience, or to reflect equipment or operational changes.

8. The owner/operator shall maintain a log book of the daily ESP secondary voltage and current readings. In addition, the owner/operator shall record maintenance activities that are conducted on the ESP. These records will include the date and time of the observation or activity.

9. The owner/operator shall notify the Office of Air Resources in writing of the date of actual initial start-up of the wood-fired boiler and ESP no later than fifteen days after such date.

10. The owner/operator shall notify the Office of Air Resources in writing of the date each stack for the 500-HP Cleaver Brooks boiler and the 500-HP York Shipley boiler is raised to 70 feet as required in Condition No. G.6.

11. The owner/operator shall notify the Office of Air Resources in writing of any physical or operational change to any equipment that would:

    a. Change the representation of the facility in the application.

    b. Alter the applicability of any state of federal air pollution rules or regulations.

    c. Result in the violation of any terms or conditions of this permit.

    d. Qualify as a modification under APC Regulation No. 9.

    Such notification shall include:

    - Information describing the nature of the change.
    - Information describing the effect of the change on the emission of any air contaminant.
    - The scheduled completion date of the planned change.

    Any such change shall be consistent with the appropriate regulation and have the prior approval of the Director.

12. The owner/operator shall notify the Office of Air Resources of any anticipated noncompliance with the terms of this permit or any other applicable air pollution control rules and regulations.

13. The owner/operator shall notify the Office of Air Resources, in writing, of any noncompliance with the terms of this permit within 30 calendar days of

becoming aware of such occurrence and supply the Director with the following information:

a. The name and location of the facility;

b. The subject source(s) that caused the noncompliance with the permit term;

c. The time and date of first observation of the incident of noncompliance;

d. The cause and expected duration of the incident of noncompliance;

e. The estimated rate of emissions (expressed in lbs/hr or lbs/day) during the incident and the operating data and calculations used in estimating the emission rate;

f. The proposed corrective actions and schedule to correct the conditions causing the incidence of noncompliance.

14. All records required in this permit shall be maintained for a minimum of five years after the date of each record and shall be made available to representatives of the Office of Air Resources upon request.

G. Other Permit Conditions

1. To the extent consistent with the requirements of this approval and applicable federal and state laws, the facility shall be designed, constructed and operated in accordance with the representation of the facility in the permit application.

2. Employees of the Office of Air Resources and its authorized representatives shall be allowed to enter the facility at all times for the purpose of inspecting any air pollution source, investigating any condition it believes may be causing air pollution or examining any records required to be maintained by the Office of Air Resources.

3. At all times, including periods of startup, shutdown and malfunction, the owner/operator shall, to the extent practicable, maintain and operate the facility in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Office of Air Resources which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures and inspection of the source.

4. The ESP shall be operated according to its design specifications whenever the Messersmith boiler is in operation or is emitting air contaminants.

5. The firing capacity of each burner installed on the 500-HP Cleaver Brooks boiler and the 500-HP York Shipley boiler shall not exceed 140 gallons per hour.

6. Operation of wood-fired boiler shall not commence until the stack modifications for 500-HP Cleaver Brooks boiler and the 500-HP York Shipley boiler are completed. Each stack shall be raised to 70 feet above a base datum of 558 feet and shall not be equipped with rain caps.

7. The facility is subject to the requirements of 40 CFR 63, Subpart A, "General Provisions" and Subpart JJJJJJ, "National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources". Compliance with all applicable provisions therein is required unless otherwise stated in this permit. If there is any conflict between any term or condition of this permit and the applicable provisions of 40 CFR 63, the owner/operator shall comply with the most stringent requirement.

8. The owner/operator shall not burn "wood residue" without prior authorization from the Office of Air Resources. "Wood residue" means a waste by-product of the pulp and paper industry which consists of bark, sawdust, slabs, chips, shavings and mill trims. The term "pulp and paper industry" consists of those industries that have a two digit Standard Industrial Code (SIC) code of 26 or a three digit North American Industry Classification System (NAICS) code of 322.

9. The emission and dispersion characteristics of the wood-fired boiler shall be consistent with the parameters used in the air quality modeling to demonstrate that the emissions from the facility do not cause or contribute to air pollution in violation of any national ambient air quality standard or do not cause an impact which exceeds the Acceptable Ambient Level for any air toxic contaminant. The Office of Air Resources, in its sole discretion, may reopen this minor source permit if it determines that the emission and dispersion characteristics have changed significantly and that emission limitations must be revised and/or added to this permit to ensure that the facility does not cause or contribute to air pollution in violation of any national ambient air quality standard or any Acceptable Ambient Level.

10. The Office of Air Resources may reopen and revise this permit if it determines that:

    a. a material mistake was made in establishing the operating restrictions; or,

    b. inaccurate emission factors were used in establishing the operating restrictions; or,

c. emission factors have changed as a result of stack testing or emissions monitoring.

H. Malfunctions

1. Malfunction means a sudden and unavoidable breakdown of process or control equipment. In the case of a malfunction of any air pollution control system, all reasonable measures shall be taken to assure resumption of the designed control efficiency as soon as possible. In the event that the malfunction of an air pollution control system is expected or may reasonably be expected to continue for longer than 24 hours and if the owner or operator wishes to operate the source on which it is installed at any time beyond that period, the Director shall be petitioned for a variance under Section 23-23-15 of the General Laws of Rhode Island, as amended. Such petition shall include, but is not limited to, the following:

   a. Identification of the specific air pollution control system and source on which it is installed;

   b. The expected period of time that the air pollution control system will be malfunctioning or out of service;

   c. The nature and quantity of air contaminants likely to be emitted during said period;

   d. Measures that will be taken to minimize the length of said period;

   e. The reasons that it would be impossible or impractical to cease the source operation during said period.

2. The owner/operator may seek to establish that a malfunction of any air pollution control system that would result in noncompliance with any of the terms of this permit or any other applicable air pollution control rules and regulations was due to unavoidable increases in emissions attributable to the malfunction. To do so, the owner/operator must demonstrate to the Office of Air Resources that:

   a. The malfunction was not attributable to improperly designed air pollution control equipment, lack of preventative maintenance, careless or improper operation, or operator error;

   b. The malfunction was not part of a recurring pattern indicative of inadequate design, operation, or maintenance;

   c. Repairs were performed in an expeditious fashion. Off-shift labor and overtime should be utilized, to the extent practicable, to ensure that such repairs were completed as expeditiously as practicable.

d. All possible steps were taken to minimize emissions during the period of time that the repairs were performed.

e. Emissions during the period of time that the repairs were performed will not:

(1) Cause an increase in the ground level ambient concentration at or beyond the property line in excess of that allowed by Air Pollution Control Regulation No. 22 and any Calculated Acceptable Ambient Levels; and

(2) Cause or contribute to air pollution in violation of any applicable state or national ambient air quality standard.

f. The reasons that it would be impossible or impractical to cease the source operation during said period.

g. The owner/operator's action in response to the excess emissions were documented by properly signed, contemporaneous operating logs or other relevant evidence.

This demonstration must be provided to the Office of Air Resources, in writing, within two working days of the time when the malfunction occurred and contain a description of the malfunction, any steps taken to minimize emissions and corrective actions taken.

The owner/operator shall have the burden of proof in seeking to establish that noncompliance was due to unavoidable increases in emissions attributable to the malfunction.

Table 1. Emission Limitations for Listed Air Toxics

Pollutant	Emission Limitation		
	pounds/hour	pounds/day	pounds/year
Acetaldehyde			62.27
Acrolein	5.56×10^{-04}		4.87
Arsenic	3.89×10^{-05}		0.341
Benzene	0.036	0.864	315.36
Beryllium		2.26×10^{-04}	0.083
Cadmium		8.43×10^{-04}	0.308
Chlorine	6.77×10^{-03}	0.162	59.30
Chromium (hexavalent)		7.20×10^{-04}	0.263
Cobalt			0.488
Formaldehyde	0.0163	0.391	142.79
Hydrogen chloride	0.163		1427.88
Lead			3.60
Manganese		0.018	6.68
Naphthalene		0.020	7.28
Nickel	2.83×10^{-04}	6.79×10^{-03}	2.48
Phosphorus	2.31×10^{-04}	5.54×10^{-03}	
Polycyclic Organic Matter			0.278
PCDDs/PCDFs & Dioxin-like PCBs			1.02×10^{-05}
Vanadium	8.39×10^{-06}		