Exhibit 18

Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

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June 30, 2011

Dr. Victor Gatto
Palmer Renewable Energy, LLC
40 Shawmut Road
Suite 200
Canton, MA 02021

Re: Regulation 310 CMR 7.02(5)(a)
Palmer Renewable Energy, LLC
35 MW Biomass-Fired Power Plant
Application #1-P-08-036
Transmission # X224282

Conditional Approval

Dear Dr. Gatto:

Enclosed herein please find a Conditional Approval for Comprehensive Plan Approval under Section 7.02 of the Commonwealth's Air Pollution Control Regulations (301 CMR 7.00) for the proposal by Palmer Renewable Energy LLC to construct a biomass-fired power plant at 1000 Page Boulevard in Springfield, MA.

Project Background

On November 21, 2008, the Department of Environmental Protection, Bureau of Waste Prevention, Western Regional Office ("MassDEP") received a Major Comprehensive Plan Application from Palmer Renewable Energy, LLC, 40 Shawmut Road, Suite 200, Canton, Massachusetts ("PRE") for the construction and operation of a 35 megawatt (MW) (nominal net output) biomass-fired power plant to be located at 1000 Page Boulevard in Springfield, MA. As originally proposed, the facility had planned to utilize construction and demolition (C&D) debris for the bulk of its fuel source.

In accordance with the Massachusetts Environmental Policy Act (MEPA), PRE submitted an Environmental Notification Form to the Executive Office of Energy and Environmental Affairs on April 30, 2008 (EOEEA No. 14243) concerning the proposed project. The Secretary of Energy and Environmental Affairs issued a Certificate on June 6, 2008 indicating that the project did not require the preparation of an Environmental Impact Report (EIR).

Subsequent to that time, PRE altered its proposal to eliminate the use of C&D as a fuel source for the facility, substituting primarily green wood chips. In addition, electrical output was decreased to 35 MW. PRE consequently submitted a Notice of Project Change to the Executive Office of Energy and Environmental Affairs on September 30, 2010. The Secretary of Energy and Environmental Affairs issued a Certificate on the Notice of Project Change on November 19, 2010, in which he determined that the changes did not increase the environmental impacts of the project, but rather reduced them, and that therefore no EIR was required.

As initially proposed, the plant was classified as a "major source" under MassDEP's air regulations since it had the potential to emit greater than 50 tons per year of nitrogen oxides (NOx) and greater than 100 tons per year of carbon monoxide (CO). As part of the Notice of Project Change, PRE submitted to MassDEP on October 1, 2010, a revision to its originally-submitted comprehensive plan application that incorporated reductions for several air contaminant emission rates as the result of the best available control technology review process. This changed the facility's classification to a "non-major source", since the potential to emit any regulated air pollutant will not exceed any applicable major source threshold. This Conditional Approval includes information provided in the 310 CMR 7.02(5)(a) Comprehensive Plan Approval and hereby incorporates the CPA submitted by PRE on November 21, 2008 and the supplemental information received on March 25, 2009, May 19, 2009, June 30, 2009, October 1, 2010, November 8, 2010, November 10, 2010, November 26, 2010, December 3, 2010 and December 21, 2010.

Basis for the Conditional Approval

In issuing this Conditional Approval, MassDEP has reviewed the PRE proposal for compliance with the following applicable air pollution control regulatory requirements: MassDEP Air Plan Approval Requirements; National Ambient Air Quality Standards (NAAQS); MassDEP Noise Requirements; New Source Performance Standards (NSPS); Clean Air Interstate Rule (CAIR); Reporting of Greenhouse Gas Emissions to Regional Registry; Title IV Sulfur Dioxide Allowances and Monitoring; Title V Operating Permit. MassDEP's analysis under each of these categories is outlined in greater detail below. In summary, MassDEP finds that the project as presented by PRE (through the submissions listed above) will meet all applicable permitting standards required for issuing this Conditional Approval, including compliance with the National Ambient Air Quality Standards (NAAQS). The NAAQS are stringent health-based standards established under the Clean Air Act (CAA) that are designed to preserve public health and protect sensitive subpopulations, such as people with diseases (e.g. asthma, cardiovascular disease), children and the elderly.

MassDEP also finds that PRE has substantially reduced the emissions profile of the facility that is the subject of this Conditional Approval (which would be limited to using primarily green wood chips derived from tree pruning, land clearing, etc., but not forestry operations) compared to its initial submission which used C&D wood as a fuel. The revised proposal meets or exceeds all applicable standards for emissions of air pollutants and, when compared to the prior proposal, reduces most hazardous air pollutants (HAPs) emissions, as well as emissions of heavy metals and reduces nitrogen oxides (NOx) by over 72 %, and carbon monoxide (CO) by approximately 48%.

This Conditional Approval contains a comprehensive set of conditions, reporting obligations and mitigation measures, including state-of-the-art air pollution control technology and development of fuel specifications to minimize pollutant levels. MassDEP believes that the terms and conditions specified herein will ensure the ongoing compliance of the facility with all appropriate and applicable standards.

Environmental Justice

Title VI of the federal Civil Rights Act of 1964 applies to all recipients of federal financial assistance. The Executive Office of Energy and Environmental Affairs (EOEEA) is a recipient of federal financial assistance for the administration of the Department's air pollution control program. Section 601 of Title VI provides that:

> No person in the united States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subject to discrimination under any program or activity receiving federal financial assistance.

On October 2, 2002, EOEEA adopted an Environmental Justice Policy (EJ Policy) that requires the Department to make environmental justice an integral consideration in the implementation and enforcement of laws, regulations, and policies. The EOEEA EJ Policy is used to implement the federal Title VI of the Civil Rights Act. The EOEEA EJ Policy addresses two areas of enhanced reviews to address environmental justice concerns:

1) Enhanced Public Participation; and
2) Enhanced Analysis of Impacts and Mitigation

Although the area in which the project will be constructed is an EJ community, the PRE project is not subject to the EJ Policy because it does not trigger MEPA thresholds. Secretary Bowles indicated in the Notice of Project Change (NPC) Certificate dated 11/19/10 that projects proposed in this area must meet every applicable air permitting standard and that projects be required to avoid, minimize and mitigate environmental impacts to the maximum extent feasible. The NPC Certificate stated that the project meets this high standard and that the air quality permitting process will require its implementation, which it has.

In addition, Secretary Sullivan's letter dated 3/31/11 states that the EJ Policy, with respect to MEPA review, proscribes when "enhanced public participation" is required for projects undergoing MEPA review (i.e. any project that exceeds an ENF threshold for air, solid and hazardous waste or wastewater and sewage sludge treatment and disposal) and when "enhanced analysis of impacts and mitigation" is required in an EIR scope (i.e. a project that exceeds an EIR threshold for air, solid and hazardous waste or wastewater and sewage sludge treatment). The project currently does not exceed any MEPA review threshold for air, solid and hazardous waste or wastewater and therefore is not subject to the EJ Policy.

Although PRE is not subject to the EJ Policy, PRE has complied with the enhanced public participation requirements of the EJ Policy by publishing A Notice of Public Comment and Notice of Public Hearing in The Republican and The Reminder on March 7, 2011, and a Spanish version of the notice in the El Pueblo Latino on March 10, 2011. MassDEP also stated in the Spanish public notice that a Spanish version of the draft non-major comprehensive plan approval would be made available upon request. A Public Hearing was held at John J. Duggan Middle School in Springfield on April 5, 2011 and the deadline for public comments was extended from April 9, 2011 to April 29, 2011.

PRE has also conducted an analysis of impacts as provided in the health risk assessment (HRA) which was included in Appendix D of the NPC submitted by PRE. The HRA provided an assessment of the baseline health status with the community, evaluated potential health impacts by comparing project emissions with health-based benchmarks (such as the NAAQS) and evaluated the potential project impacts within the context of background level of pollutants within an appropriate

area. The assessment included evaluation of short-term and annual average emissions of criteria air pollutants; assessment of total inhalation cancer and non-cancer health risks associated with stack emissions; acute inhalation risks for respiratory irritants; potential ingestion risks associated with deposition of arsenic, lead and dioxin from the stack onto soils; potential impacts of mercury stack emissions on nearby freshwater fish; and potential risks attributable to other emissions including mobile and fugitive emissions sources associated with the project. The HRA concluded that the facility will not adversely affect public health.

PRE has further agreed to provide the following mitigation and monitoring as requested by the NPC Certificate which includes methods to reduce air pollution and minimize health impacts.

For the purposes of improving the efficiency of the plant process and minimizing greenhouse gas emissions, PRE has proposed to further evaluate or implement the following efficiency improvements as identified by The Massachusetts Division of Energy Resources (DOER).

- PRE will install a steam turbine generator that will be a multi-valve, multi-stage design using state of the art steam throttle conditions, high level stage efficiencies and full condensing at minimum pressure to extract the maximum amount of energy from each pound of steam passing through the machine. In addition, the steam turbine will include an extra extraction port to allow for future incorporation of cogeneration steam output.

- PRE will modify the steam cycle design to improve overall plant efficiency by implementing a reheat type cycle which will improve the overall efficiency by approximately 14% (i.e. from a base of 24.4% to 27.8%).

- PRE will design the plant to run primarily at or near full load. Major pumps and fans will operate at a single load except for transition periods such as startup or shutdown. In these cases, variable frequency drives (VFDs) offer no efficiency benefit. However, in applications such as material handling, where variable loads are expected on a routine basis, either multiple components will be installed, operating in a step-wise sequence to match the load, or VFDs will be utilized. Equipment optimizations will be conducted during the detailed design.

- PRE will optimize high pressure steam line routing and line sizing to minimize system pressure drops.

- PRE will evaluate VFDs for air cooled condenser fan motors and variable pitch blades (VPBs) during the detailed design. Maintaining efficient control of airflow through the air cooled condenser is necessary to manage proper operation of the steam cycle.

- PRE will optimize the air cooled condenser sizing and arrangement to minimize pressure drop within the constraints of steam turbine operation.

- PRE evaluated the use of fuel drying as part of the non-major comprehensive plan approval application and found that the costs, increase in PM and VOC emissions, along with other issues, far outweighed the potential efficiency gains from wood fuel drying. However, PRE will continue to evaluate fuel drying in the detailed design to determine if there is an economically viable method of drying the wood fuel without increasing VOC and PM emissions.

- PRE will evaluate premium grade step-up and distribution transformers for reducing operating losses. This will be evaluated for the economic viability of equipment performance during the detailed design.

- PRE will evaluate controls to minimize energy for operating in all process modes for fuel handling and conveyance system. This will be evaluated for the economic viability of equipment performance during the detailed design.

- PRE will evaluate a state of the art feedwater treatment system to reduce boiler blowdown. This will be evaluated for the economic viability of equipment performance at the time of detailed design.

PRE has also committed to implementing the following greenhouse gas mitigation measures consisting of the following:

- a high-efficiency shell and heating ventilation/air condition (HVAC) system for the office building.
- the use of biodiesel for the yard front-end loader.
- encourage the use of biodiesel by fuel delivery and ash haul trucks.
- the installation of a solar photovoltaic (PV) array with an approximate capacity of 135 kW on the roof of the fuel storage shed to provide onsite power.
- the use of refrigerants with low ozone depletion potential.
- establish a goal of a 50% reduction in construction debris.
- continue to explore the incorporation of cogeneration at the site and conduct a district energy prefeasibility assessment to identify potential users.

Within 12 months of issuance of the air quality plan approval, PRE has committed to providing an engineering report to MassDEP on the efforts to maximize efficiency and mitigate greenhouse gas emissions through design and operation measures including those mentioned above. After the initial report, PRE will submit an engineering report to MassDEP by January 30th of each year. This report shall contain, at a minimum, an update on the efficiency improvements and greenhouse gas mitigation measures listed above as well as a list of any new improvements to process efficiency or greenhouse gas mitigation that are being implemented or evaluated by PRE with a goal of achieving 33% efficiency within 5 years of commencing operation. The report will also contain an update on efforts to incorporate cogeneration and/or district energy.

As mobile sources are not part of the air quality non-major comprehensive plan approval review for stationary sources, PRE has voluntarily agreed to provide diesel retrofits for 25 diesel trucks owned by Palmer Paving or Northern Tree Service, and/or municipal trucks. The retro fits will consist of Catalyzed Diesel Particulate Filters (CDPF), which EPA has indicated would reduce PM by 90% when combined with ultra low sulfur distillate oil. The CDPF will also reduce CO and VOC emissions on the order of 20% to 90%.

PRE will provide $2 million to the City of Springfield as mitigation for the project. Of that amount, $1.33 million will be dedicated specifically to funding local health improvements.

PRE entered into a Host Community Benefit Agreement dated September 23, 2008 with the City of Springfield and the East Springfield Neighborhood Council. This document has been attached to the non-major comprehensive plan approval as Appendix A.

The NPC Certificate also required the use of post-construction air monitoring at the property perimeter. PRE has agreed to establish three separate $PM_{2.5}$ air quality monitors, two NO_2 air quality monitors and a permanent meteorological (met) station. The location of the monitors will be determined during the monitoring protocol review. The met station will be located on top of the fuel building for recording wind speed and direction.

Each monitor will be operated during the initial year of operation to capture $PM_{2.5}$ 24-hour average data and NO_2 1-hour average data during three months in the summer as well as three months during the winter. PRE has committed to providing the monitored $PM_{2.5}$ 24-hour average data, the monitored NO_2 1-hour average data and all reports submitted to MassDEP for public access on a website.

Public Process

A Notice of Public Comment and Notice of Public Hearing were published in The Republican and The Reminder on March 7, 2011, and in the El Pueblo Latino on March 10, 2011. The comment period was extended from April 9, 2011 to April 29, 2011. During the public comment period, written comments were received. A Public Hearing was held at John J. Duggan Middle School on April 5, 2011. Oral and written testimony was received at this hearing.

As part of the review process MassDEP released a draft plan approval and on April 5, 2011, conducted a Public Hearing, and reviewed significant written comments. Based on the comments received, MassDEP revised the approval to make it more protective of public health. The revisions include a risk management plan for ammonia storage, a benefit agreement for the community that includes funding of local health improvements, a reduction in the allowable boiler emissions for volatile organic compounds and particulate matter, a revision of time limitations for wood deliveries and silo loading, an inclusion of a goal for achieving a minimum efficiency of 33% within 5 years of commencing operation, the requirement to cover or enclose all wood delivery trucks and the purchase of mass-based emission offsets of nitrogen oxide compounds, an ozone precursor.

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List of Abbreviations

AAL - Allowable Ambient Limit
ACFM – Actual Cubic Feet Per Minute
AFB - Air Force Base
ANSI – American National Standards Institute
ASTM – American Standard Test Method
BACT – Best Available Control Technology
BFB - Bubbling Fluidized Bed
BUD - Beneficial Use Determination
CAIR - Clean Air Interstate Rule
CEMS – Continuous Emission Monitoring System
CFR – Code of Federal Regulations
CMR- Code of Massachusetts Regulations
CMS - Continuous Monitoring Systems
CO - Carbon Monoxide
CPA –Comprehensive Plan Application
DAHS – Data Acquisition and Handling System
dBA - A-weighted decibels
ENF - Environmental Notification Form
EIR- Environmental Impact Report
EOEEA -Executive Office of Energy and Environmental Affairs
EPA – Environmental Protection Agency
ERCs - Emission Reduction Credits
ESP - Electrostatic Precipitator
GEP - Good Engineering Practice
GGH - Gas-To-Gas Heat Exchanger
HAP -Hazardous Air Pollutant
HCl – Hydrogen Chloride
HF - Hydrogen Fluoride
Hg -Mercury
HRSCR – High Efficiency Regenerative Selective Catalytic Reduction
lb/MMBtu – pound per million Btu of heat input
kW - Kilowatts
LAER – Lowest Achievable Emission Rate
MACT - Maximum Achievable Control Technology
MEPA – Massachusetts Environmental Policy Act
µg/g – microgram per gram
mg/kg – milligram per kilogram
MMBtu/hr - million Btu per hour
MW -Megawatt
NAAQS - National Ambient Air Quality Standards
NESHAP - National Emission Standards for Hazardous Air Pollutants
ng/g – nanogram per gram
NH_3 - Ammonia
NH DES – New Hampshire Department of Environmental Services
NIST - National Institute of Standards and Technology
NO_2 - Nitrogen Dioxide

NOx- nitrogen oxides
NPDES - National Pollution Discharge Elimination System
NSA –Noise Sensitive Areas
NSPS - New Source Performance Standards
NSR - New Source Review
O_3 - Ozone
Pb – Lead
PM - consists of all filterable and condensable particulate matter including PM_{10} and $PM_{2.5}$.
PM_{10} - consists of filterable and condensable PM with an aerodynamic diameter equal to or less than 10 microns.
$PM_{2.5}$ - consists of filterable and condensable PM with an aerodynamic diameter equal to or less than 2.5 microns.
PL 1 – Property Line 1
PSD – Prevention of Significant Deterioration
SO_2 – Sulfur Dioxide
SO_x – Sulfur Oxides
TEL - Threshold Effects Exposure Limit
USEPA – United States Environmental Protection Agency
VOC – Volatile Organic Compound

I. Facility Description

PRE is proposing to construct a 35 MW (nominal net output) biomass-fired power plant to be located at 1000 Page Boulevard in Springfield, MA. The facility will consist of a complete fuel receiving and handling system, a 509 million British thermal units per hour (MMBtu/hr) water-cooled grate stoker fired boiler (stoker), associated air pollution control devices, a single steam turbine, an air cooled condenser, bottom ash and fly ash handling and storage systems, a 30 ton lime storage silo and an aboveground 14,000 gallon double walled aqueous ammonia storage tank.

The stoker boiler will burn a maximum of 432,160 tons per year and an annual average of 1,184 tons per day of wood fuel, which will consist of primarily green wood chips with natural gas as a supplemental fuel used for startups, flame stabilization and flue gas reheat for the high efficiency regenerative selective catalytic reduction (HRSCR) system. The boiler will be equipped with extensive air pollution control equipment, which will include a dry circulating fluid bed scrubber, a fabric filter and a HRSCR system.

As initially proposed, the plant was classified as a "major source" since it had the potential to emit greater than 50 tons per year of nitrogen oxides (NOx) and greater than 100 tons per year of carbon monoxide (CO). However, a supplemental revision, received on October 1, 2010, to the comprehensive plan application incorporated reductions for several air contaminant emission rates under the best available control technology review process. This changed the facility's classification to a "non-major source" since the potential to emit any regulated air pollutant will not exceed any applicable major source threshold. Therefore, the Emission Offset and Nonattainment Review requirements of 310 CMR 7.00, Appendix A will not apply since the facility will not emit greater than 50 tons per year of NOx or 50 tons per year of volatile organic compounds (VOCs).

A. Site Description

The biomass-fired power plant will be located at the 1000 Page Boulevard site in Springfield, MA that is owned by Palmer Paving Corporation. Approximately 7 acres of the existing 13 acre site will be dedicated to the Project; an existing asphalt plant will remain on site. Palmer Paving Corporation will continue its basic operations but the Project will displace an asphalt recycling operation currently located on the northern part of the site.

The site is bounded by Page Boulevard (Route 20) and a Friendly's restaurant to the south, Cadwell Drive to the east, a private roadway accessing a Western Massachusetts Electric Company (WMECO) service facility and printing company to the north, and WMECO electrical transmission lines and the Route 291/Route 20 interchange to the west.

Electricity generated from the plant will be supplied to the regional grid via an on-site or off-site switch gear and connection to the abutting 115 kV WMECO transmission lines.

B. Project Description

Wood Receiving, Processing and Storage

The facility will be equipped with wood fuel receiving, processing and storage operations. The wood fuel will be delivered to the facility by 25 ton trucks, five to six days per week, during daytime hours. Each delivery truck will be clamped to one of two truck dumpers which will elevate the front of the truck to empty the wood into a transfer bin. The bin will be covered with a roof. From the transfer bin, the wood will pass through a self clean magnet to remove any metals and will then be fed by a 175 ton per hour stock-out conveyor (stock-out conveyor #1) into a vibratory screen for classification. Small wood pieces that fall through the screen will be transferred by a series of three -

175 ton per hour conveyors (stock-out conveyor #2, stock-out conveyor #3 and stock-out conveyor #4) to the bulk storage shed. Wood that cannot pass through the screen will be diverted to a grinder which will reduce the chip size and discharge to the same conveyor system used for the screen. Once the wood has been transferred to the bulk storage shed by conveyor, it will be discharged directly onto a reversible shuttle conveyor which will be located 35 feet above the storage shed floor. The function of the shuttle conveyor is to distribute wood fuel along the 250 foot length of the shed and assist in the formation of the wood stockpile. The storage shed will be a 3-sided covered shed with an area of 30,000 square feet that will be capable of storing a 5,000 ton pile (approximately a 4.5 day supply of wood fuel). The storage shed will also protect the 30 foot high wood chip pile from weather and will minimize any possible fugitive emissions and mitigate noise. The northern side of the shed will be partially open so that a front end loader can access the wood pile to maintain the pile and to feed the wood chips into a reclaim grate and hopper which will feed a 100 ton per hour reclaim pan. From the reclaim pan, the wood chips will be transferred through a series of three - 100 ton per hour reclaim conveyors (reclaim conveyor #1, reclaim conveyor #2 and reclaim conveyor #3) which will discharge into two metering bins. The bins will contain 8-hours of fuel capacity that will be distributed via four to five pneumatic distribution boiler feeders which will feed to the boiler approximately 98,643 pounds per hour of wood chips while operating at a design heat input capacity of 509 MMBtu/hr.

The reclaiming of wood fuel from the stockpile will occur simultaneously with the wood fuel stockout operations. Hence, the shuttle conveyor will load fuel into the east side of the storage shed while the front end loader will recover fuel from the west side of the shed. It will take about three days to clear out the fuel located on the west side of the fuel shed while the east side is being filled. At the end of three days, the operation will be reversed with the front end loader working the east side of the shed and the west side being filled with wood fuel. This type of storage and reclaim operation will prevent fuel which was first delivered/processed from ending up at the bottom of the pile.

Fugitive particulate matter emissions from the wood fuel receiving, processing and storage operations will be minimized using enclosures and a water misting system. More specifically, PRE has proposed to house the screening and grinding operations in a fully enclosed building and all conveyors and transfer points will be fully enclosed from the dump transfer bin to the boiler feed metering bin. A 3-sided shed in conjunction with a permanent on-demand misting system will minimize any fugitive emissions from the wood storage pile. The permanent on-demand misting system will consist of a disc fan water mister to be installed on the head of stock-out conveyor #4 and will be used, as needed, to moisten the surface of the wood as it drops onto the pile. Water will be supplied from the plant's service water system and the water lines to the misting system will be winterized by being electrically heat traced and insulated. The 3-sided shed will also be ventilated at approximately 60,000 acfm with the exhaust stack at 51 feet above ground level.

Wood Fuel-fired Boiler

The boiler design for the PRE facility will consist of a Riley Power, or equivalent, advanced stoker-fired boiler with a maximum heat input rate of 509 million British thermal units per hour (MMBtu/hr) which will be housed in an acoustically treated building. The boiler will have combustion and over-fire air controls as well as combustion air pre-heating, an economizer, water-cooled grate and feedwater heating to maximize the thermal efficiency. It will also have a balanced draft design to eliminate out-leakage of combustion products. Green wood chips will be fired in the boiler to supply steam to a multi-stage condensing turbine generator which will generate 35 MW of electricity.

Natural gas will be fired in the boiler's Coen, or equivalent, startup burner during cold and hot startups until the steam output reaches 40% load and for flame stabilization during operation with wood fuel. The startup burner will have a maximum heat input rate of 127 MMBtu/hr. It is expected that there may be up to 4 cold starts and 12 hot starts per year. A cold start will require 12 hours to reach full load and natural gas will be fired during just the first 4 hours. A hot start will require 4 hours to reach full load and natural gas will be fired during just the first 2 hours. A small amount of natural gas will also be used in a 1.5 MMBtu/hr burner used for reheat and temperature control of the HRSCR system.

The facility proposes to use a maximum of 18.2 million standard cubic feet per year (MMSCF/yr) of natural gas which is based on a maximum startup burner operation of 40 hours per year and a HRSCR burner operation of 8760 hours per year.

Boiler Air Pollution Control Equipment

The exhaust gases from the boiler will exit the air heater at approximately 340°F prior to entering the Babcock Power Environmental, Inc. or equivalent, dry circulating fluid bed scrubber. The dry scrubber will be designed to remove acid gas constituents, including sulfur dioxide (SO_2), sulfur trioxide (SO_3), hydrogen chloride (HCl), hydrogen fluoride (HF), mercury (Hg) and other trace pollutants from the flue gas stream. The flue gases entering the dry scrubber will flow upward through a fluidized bed reactor which will be comprised of solids such as calcium hydroxide, calcium carbonate, the solid reaction products of the flue gas cleaning process and ash from the combustion process. Fresh and active lime sorbent reactant (either calcium hydroxide or calcium oxide) will be injected into the scrubber while solids that have already undergone several cycles will be recirculated into the scrubber from the down stream fabric collector. Additionally, water will be injected at the inlet of the scrubber to lower the temperature to approximately 215°F for increased acid gas removal and relative humidity. The temperature of the exhaust flue gases will be continuously monitored and recorded at the inlet of the dry scrubber. The wetting of recirculated sorbents creates new reactive surfaces on the solid particles and the lower temperature promotes condensation of VOCs and metals on the solid particles.

The flue gas exiting the scrubber will contain fly ash, absorbent and reaction products such as calcium sulfite ($CaSO_3$), calcium sulfate ($CaSO_4$), calcium chloride ($CaCl_2$) and calcium fluoride (CaF_2). These solid particles will be removed from the flue gas stream by a SP Environmental, or equivalent, pulse jet type fabric collector. A portion of the collected solids will be recirculated to the scrubber inlet at a high ratio to the inlet solids and the remaining collected solids from the fabric collector will be pneumatically conveyed to a 170 ton ash storage silo for shipment offsite.

Downstream of the fabric collector will be a Babcock Power Environmental, Inc., or equivalent, HRSCR system comprised of two-canisters which will each have one layer of catalyst and an oxidation catalyst to minimize NOx, CO and VOC emissions. The HRSCR system will be located downstream of the fabric collector to minimize the blinding effect of dust and alkali metals on the HRSCR's reduction catalyst. Aqueous ammonia (19% ammonia by weight), which serves as the reagent for the HRSCR system, will be injected upstream of the HRSCR. An ammonia control system will be provided to accurately inject the correct stoichiometric amount of ammonia required to achieve a maximum NOx removal rate while minimizing the ammonia slip. The flue gases will be reheated within the HRSCR system to bring the catalyst temperature into the range for reaction. This flue gas reheat will be through the use of a 1.5 MMBtu/hr natural gas-fired duct burner and a regenerative ceramic bed that will heat the flue gas to a maximum temperature of 650°F to increase

the overall pollutants removal efficiency of the control device to greater than 90% for NOx, 75%-80% for CO and 50% for VOC. The final flue gas reheat temperature will be based upon optimization after startup.

The cleaned exhaust gases will be emitted to the atmosphere through a steel stack that will have a maximum inside diameter of 6.167 feet at the point of exhaust, a minimum height of 275 feet above ground level and a minimum exit velocity of 104.3 feet per second at full load. The proposed stack height is equivalent to the Good Engineering Practice (GEP) stack height.

Ancillary Sources

Ancillary sources will consist of a 170 ton ash storage silo and a 30 ton lime storage silo. No diesel-fired fire pumps or diesel-fired emergency generators have been proposed for the facility.

1. Ash Storage Silo

The solids collected in the stoker boiler's fabric collector, which will contain fly ash, powdered activated carbon granules, un-reacted lime and lime reaction products, will be pneumatically conveyed to a 170 ton ash storage silo at approximately 2,490 pounds per hour.

The ash silo will be equipped with a pugmill that will condition the solids with continuous water injection. The water conditioned ash will be discharged into an enclosed chute to feed the ash truck in a shed underneath the silo. These solids, as well as bottom ash, will be shipped offsite by means of a covered truck or maintained onsite for beneficial reuse as approved by MassDEP. The ash storage silo will be equipped with a pulse jet bin vent fabric collector designed to process an air flow rate of 2,700 actual cubic feet per minute (acfm). PRE has proposed to limit the operation of the ash silo to no more than 4000 hours in any 12 consecutive month period.

2. Lime Storage Silo

The lime used as the reactant for the dry scrubber will be stored in a 30 ton lime storage silo. A delivery truck will pneumatically convey the lime to the silo. The unloading of lime to the silo will take approximately 3 hours and will occur approximately 10 times per year. From the silo, the lime will be metered to the dry scrubber in a fully enclosed system. The lime silo will be equipped with a pulse jet bin vent fabric collector designed to process an air flow rate of 1,200 acfm. PRE has proposed to limit the operation of the lime silo to no more than 300 hours in any 12 consecutive month period.

Wood Fuel Characterization and Specification

PRE plans to use wood fuel consisting of green wood chips, also known as "virgin" or "clean" wood. The qualifying sources for the wood fuel are further discussed in the following paragraphs.

In accordance with 310 CMR 7.00, clean wood fuel may consist of whole trees, tree trimmings, cord wood, logs, lumber, stump grindings, saw dust, wood pellets, slabs, bark, chips, waste pallets, and/or wooden boxes. Sources of clean wood fuel for PRE will be supplied from non-forest derived wood materials which will consist of:

- Primary forest products industry: Lumber mill residues or lumber processing residues consisting of the slabs, shavings, trimmings, sawdust, bark, end pieces of wood, and log cores that result from the various processing operations occurring in sawmills pulp mills, and veneer and plywood plants.

- Secondary forest products industry: Woody biomass produced by the secondary forests products industry including but not limited to clean residues form woodworking shops, furniture factories, and truss and pallet manufacturing.
- Land use change – non-agricultural: Growing stock and other timber sources cut or otherwise destroyed in the process of converting forest land to non-forest and non-agricultural uses, principally residential and commercial development.
- Land use change – agricultural: Growing stock and other timber sources cut or otherwise destroyed in the process of converting forest land to agricultural usage, either for new or restored farm land.
- Yard waste – Leaves, grass clippings, prunings, and other natural organic matter discarded from yards and gardens.
- Wood waste: Non-treated clean sawn lumber; pallets; pruned branches, stumps and whole trees from public or private roads, highways, driveways, utility line, right of way and park maintenance.

Sources of non-forest derived wood materials will consist of Commercial Tree Care Service and Landscaping Firms, State and Municipal Park and Recreation Departments and Tree Care Divisions: Utility Line Construction and Maintenance Firms; Development, Land Clearing and Excavating Firms; and Orchards. It may also include municipal wood fuel including pallet grindings.

Municipal wood fuel will consist of clean wood collected from either a municipal transfer facility or a private wood yard facility. Wood from a private wood yard that accepts any type of treated wood is prohibited for use as fuel in the PRE plant. PRE shall not accept any clean wood fuel from private wood yards which are permitted to accept treated wood. MassDEP has determined that a municipal transfer facility may qualify as a clean wood fuel source only if it receives clean wood and is not co-located with a solid waste transfer station. No other municipal transfer facilities will be qualified as clean wood fuel sources unless they are first approved as such in writing by MassDEP.

The pallet recycling industry in New England picks up pallets from many locations, grinds the material and sells it to the marketplace. PRE will be prohibited from purchasing pallet grindings from a wood waste facility which accepts treated or contaminated wood. Any Asian Longhorned Beetle infested wood will be regulated in accordance with all Federal and Massachusetts standards including the United States Department of Agriculture Plant Protection Act of 7 CFR 301.51.[1]

To ensure compliance with the clean wood fuel specification, PRE will have a clean wood fuel monitoring and testing plan which will consist of supplier contracts, prequalification supplier testing, onsite wood fuel monitoring, onsite wood fuel testing and regular ongoing unannounced audits for each municipal wood facility and private wood yard facility. Prior to accepting any clean wood at the facility, all suppliers of clean wood fuel will sign a contract with PRE prohibiting any type of treated wood in the fuel supply to PRE. A copy of each signed contract will be provided to MassDEP which shall include the results of an initial wood sampling test for arsenic, chromium, lead and mercury for each municipal wood facility and private wood yard facility. PRE has developed a wood fuel specification with maximum concentration requirements for arsenic, chromium, lead and mercury, which will be used during prequalification supplier testing and onsite wood fuel testing. The maximum allowable concentrations for wood fuel from a municipal wood facility and private

[1] http://massnrc.org/pests/albdocs/ALBFederalOrder1-9-09.pdf

wood yard facility, as delivered, will be 1.9 mg/kg of arsenic, 30.4 mg/kg of chromium, 31.6 mg/kg of lead and 0.1 mg/kg of mercury. Additionally, there will be an annual average, as delivered, for chromium and lead of 8.3 mg/kg and 6.7 mg/kg, respectively. The annual average will be based on the average of all composite wood samples collected in any 12 consecutive month period. The only clean wood fuel suppliers which MassDEP considers as exempt from the above monitoring and testing are those suppliers which will supply only whole tree fuel, tree trimmings and/or stump grindings that has not been collected from either a municipal transfer facility or a private wood yard facility.

MassDEP reserves the right to modify the wood fuel supplier and onsite wood fuel sampling and testing constituents and frequency at any time.

II. Source Emissions

The annual potential emissions from the facility are based on the worst case emissions from the advanced stoker boiler burning 100% wood fuel for 8,760 hours at a maximum heat input rate of 509 MMBtu/hr. The boiler emissions include those from the firing of natural gas in the 1.5 MMBtu/hr HRSCR duct burner for 8,760 hours. Included in the annual potential emission calculations are the particulate matter (PM) emissions from the lime and ash storage silos, wood storage shed as well as fugitive emissions from the paved roadways. The PM emissions from the lime and ash storage silos have been based on an emission rate of 0.005 gr/dscf as well as 300 hours per year and 4,000 hours per year of operation, respectively. The potential emissions are summarized in Table 1 below:

Table 1
Proposed Annual Potential Emission Rates (Tons Per Year)

Pollutant	Boiler	Lime Storage Silo	Ash Storage Silo	Wood Storage Shed	Fugitive Emissions	Facility Wide
NOx	37.9	-	-	-	-	37.9
CO	81.4	-	-	-	-	81.4
VOC	11.15	-	-	-	-	11.15
SO_2	26.8	-	-	-	-	26.8
PM[1]	33.44	0.008	0.231	0.41	0.46	34.55
PM_{10}[2]	33.44	0.008	0.231	0.17	0.092	33.94
$PM_{2.5}$[3]	33.44	0.002	0.053	0.02	0.023	33.54
HAPs	13.2	-	0.0012	-	-	13.2
NH_3	13.4	-	-	-	-	13.4

[1] PM consists of all filterable and condensable PM including PM_{10} and $PM_{2.5}$.
[2] PM_{10} consists of filterable and condensable PM with an aerodynamic diameter equal to or less than 10 microns.
[3] $PM_{2.5}$ consists of filterable and condensable PM with an aerodynamic diameter equal to or less than 2.5 microns.

PRE shall use the following EPA reference methods for particulate testing:

40 CFR Part 60, Appendix A, Methods 1 through 5 – Total Filterable Particulates; and
40 CFR Part 51, Appendix M, Method 202 – Condensable Particulate Matter.

Fugitive particulate matter emissions were calculated using a maximum annual wood throughput of 432,160 tons and paved road emission factors from AP-42 Section 13.2. The storage shed

particulate matter emissions were based on unloading emission factors from AP-42 Section 13.2.4 and material handling/sorting emission factors from AP-42 Section 11.9.

III. Regulatory Applicability

The applicable air pollution control regulatory requirements include demonstration by PRE of compliance with:

- **MassDEP Plan Approval Requirements**
- **National Ambient Air Quality Standards (NAAQS)**
- **MassDEP Noise Requirements**
- **New Source Performance Standards (NSPS)**
- **Clean Air Interstate Rule (CAIR)**
- **Reporting of Greenhouse Gas Emissions to Regional Registry**
- **Title IV Sulfur Dioxide Allowances and Monitoring**
- **Title V Operating Permit**
- **Risk Management Plan for Ammonia**

The air pollution control regulations that are not triggered by the facility are: the Emission Offset and Nonattainment Review requirements of 310 CMR 7.00, Appendix A; Prevention of Significant Deterioration (PSD), 40 CFR Section 52.21; the National Emission Standards for Hazardous Air Pollutants (NESHAP)/Case-By-Case Maximum Achievable Control Technology Analysis; and, the Regional Greenhouse Gas Initiative (RGGI), the "Massachusetts CO_2 Budget Trading Program", under 310 CMR 7.70. The facility is below emission thresholds for Nonattainment Review requirements since the facility has the potential to emit less than 50 tons per year of NOx and less than 50 tons per year of VOCs. The facility is below emission thresholds for PSD since the facility will not emit greater than 250 tons per year of any regulated New Source Review (NSR) pollutant. The facility is also not a major source of HAPs since it has the potential to emit less than 10 tons of any individual HAP and less than 25 tons for any combination of HAPs, thus removing the requirements of the NESHAP/Case-By-Case Maximum Achievable Control Technology Analysis. Additionally, PRE is not subject to 310 CMR 7.70 since it is not projected to, and will not, burn fossil fuels in an amount greater than 5% of its annual heat input in any year. However, the facility, once operating, will be required to annually report, certify, and verify direct emissions of greenhouse gases pursuant to 310 CMR 7.71(5).

The applicable regulatory programs are discussed below in the context of the proposed facility.

A. MassDEP Plan Approval Regulations

Since the proposed facility will have a fuel utilization emission unit (boiler) with the potential to emit 1 ton or more per year of a single air contaminant and a maximum energy input capacity of 3 MMBtu/hr or greater utilizing solid fuel with automatic fuel feed, PRE is required to file an application for a comprehensive plan approval pursuant to 310 CMR 7.02(5). The review of a facility's comprehensive plan approval application is regulated pursuant to 310 CMR 7.02(1)(b) and 310 CMR 7.02(5) and is limited to regulating emissions from stationary sources.[2] The application

[2] 310 CMR 7.02(1)(b) states that "...[a] plan approval is required prior to construction of a facility that may emit contaminants to the ambient air..." 310 CMR 7.02(5)(a) Comprehensive Plan Approval (CPA) Applicability states that "[c]alculation of potential emission associated with a CPA shall be in accordance with 310 CMR 7.02(5)(b). A CPA is required from any person prior to constructing, substantially reconstructing altering or subsequently operating any facility or emission unit." Regulation of internal combustion engines is restricted to stationary units per 310 CMR 7.02(5)(a)(3). Per 310 CMR 7.00, a facility is defined "as any installation and associated equipment, located on the same, adjacent or contiguous property, capable of emissions". An emission unit is defined as "any individual piece of equipment from which any air contaminant is emitted into the ambient air space, for example an individual boiler, a single degreaser, etc."

must demonstrate that the facility will incorporate air pollution control technologies which attain and maintain the best available control technology (BACT) emission rates for all regulated air pollutants emitted from the facility pursuant to the requirements of 310 CMR 7.02(8)(a). Pursuant to 310 CMR 7.00, BACT means an emission limitation based on the maximum degree of reduction of any regulated air contaminant emitted from any regulated facility which MassDEP, on a case-by-case basis taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such facility. BACT may also include a design feature, equipment specification, work practice, operating standard or combination thereof. It must also demonstrate that the resulting emissions from the proposed facility will not cause or contribute to a violation of applicable Massachusetts and National Ambient Air Quality Standards. The application must also demonstrate that the plant will comply with noise criteria established by MassDEP.

The ash and lime storage silos are considered to be exempt from plan approval requirements pursuant to 310 CMR 7.03(4)(a) since they will comply with 310 CMR 7.03(12) which requires dry material storage silos to be equipped with a fabric filter control capable of maintaining 99.5% control efficiency of particulate matter. However, PRE has requested to voluntarily restrict the hours of operation from each of these silos to be more representative of actual operations.

B. National Ambient Air Quality Standards (NAAQS)

The United States Environmental Protection Agency (USEPA) promulgated National Ambient Air Quality Standards for criteria pollutants, for the protection of public health and welfare (40 CFR Part 50). The Massachusetts DEP has adopted many of these same standards in Regulation 310 CMR 6.00. The criteria pollutants are particulate matter with an aerodynamic diameter of less than or equal to 10 microns (PM_{10}), fine particulate matter with a mean diameter of less than or equal to 2.5 microns ($PM_{2.5}$), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), ozone (O_3), and lead (Pb). The NAAQS can be found in the tables contained in the ambient air quality impact analysis section of this plan application.

The City of Springfield is located in a region currently classified as either in attainment or unclassifiable area for PM_{10}, $PM_{2.5}$, SO_2, NO_2, CO, and Pb. The region is also currently classified by EPA as a "moderate" nonattainment area for O_3.

To identify those new sources with the potential to violate or contribute to a violation of an ambient air quality standard, the USEPA has adopted significant impact levels (SILs) for PM_{10}, NO_2, SO_2, and CO. If the predicted impacts of a new source are found to be below the SILs, using USEPA-approved computer dispersion screening models, no further modeling analysis is required to assess compliance with the ambient air quality standards. If the modeled impacts are found to exceed the SILs, a more detailed dispersion modeling analysis is required to assess compliance with ambient air quality standards. This more detailed analysis must consider the impacts associated not only with the new source, but also with existing sources in the region.

C. MassDEP Noise Regulations

MassDEP promulgated regulations governing noise from new and existing equipment under 310 CMR 7.10 and Policy 90-001. According to the MassDEP Policy 90-001, new equipment is not permitted to increase ambient sound levels by more than ten (10) decibels above the lowest measured community sound level at both the property boundaries and the nearest inhabited structures. In addition, new equipment is not permitted to emit tonal noise. Tonal noise occurs when any octave band center frequency sound pressure level exceeds the two adjacent center frequency sound pressure levels by three (3) decibels or more.

D. New Source Performance Standards (NSPS)

The proposed biomass-fired boiler will be subject to the applicable requirements of NSPS, 40 CFR Subpart Db, 60.40b through 60.49b for Industrial-Commercial-Institutional Steam Generating Units. It was determined that the facility would not be subject to the NSPS in 40 CFR Subpart Da, 60.40da through 60.52da for electric utility steam generating units capable of combusting more than 250 MMBtu/hr heat input based on EPA's applicability determination dated December 7, 1978 which states that "steam electric generating units that combust nonfossil fuels such as WOOD residue, sewage sludge, waste material, or municipal refuse (either alone or in combination with fossil fuel) would only be covered by the proposed standards if the steam generating unit is capable of firing more than 73 MW of fossil fuel."

The applicable emission limitations from 40 CFR Subpart Db include a particulate matter emission limit of not to exceed 0.030 lb/MMBtu of heat input pursuant to 40 CFR 60.43b(h)(1) as well as an opacity limitation no greater than 20 percent opacity (6-minute average), except for one 6-minute period per hour of not more than 27 percent opacity pursuant to 40 CFR 60.43b(f). However, 40 CFR 60.43b(f) also states that owners and operators of an affected facility that elect to install, calibrate, maintain and operate a continuous emissions monitoring system for measuring PM emissions according to the requirements of Subpart Db and are subject to a federally enforceable PM limit of 0.030 lb/MMBtu or less are exempt from the opacity standard specified in 40 CFR 60.43b(f). PRE shall also comply with the applicable performance testing, monitoring, recordkeeping and reporting requirements as specified in 40 CFR Sections 60.45b, 60.46b, 60.48b, and 60.49b

E. CAIR

The Project will be subject to the requirements of the Massachusetts Clean Air Interstate Rule (Mass CAIR) under 310 CMR 7.32.

The Massachusetts Clean Air Interstate Rule (310 CMR 7.32) is a market-based program intended to reduce power plant pollution that drifts from one state to another modeled on the federal Clean Air Interstate Rule (CAIR), 70 Fed.Reg. 25162 (May 17, 2005). Although it is a federal program applicable to a number of eastern states, CAIR is implemented and administered at the state level. In Massachusetts, CAIR regulates nitrogen oxide emissions from May 1 through September 30 of each year. As with the Acid Rain Program, the rule is based on a cap and trade system where each ton of emitted ozone season NOx is offset through the allocation or purchase of allowances, and NOx monitoring is to be conducted using methods specified in 40 CFR Part 75. Accordingly, the Project will select a CAIR designated representative, in an agreement binding on the owners and operators and all CAIR Ozone Season units at the source. The CAIR designated representative shall act in accordance with the certification statement in 310 CMR 7.32(2)(d)1.d.iv and ensure compliance of the Project with all monitoring, reporting, recordkeeping and compliance requirements of Mass CAIR.

The Project will be subject to the Mass CAIR (310 CMR 7.32) since the facility will have a stationary, fossil fuel-fired boiler serving a generator with a nameplate capacity of more than 25 MWe producing electricity for sale. The Project shall comply with any and all applicable requirements of 310 CMR 7.32. Applicable requirements of 310 CMR 7.32 will be included in the Project's Operating Permit Application. A CAIR application (BWP AQ 29 Clean Air Interstate Permit Application) must be submitted to MassDEP at least 18 months prior to commencing commercial operation pursuant to 310 CMR 7.32(3)(b)1.

F. Reporting of Greenhouse Gas Emissions to Regional Registry

Even though PRE is not subject to the Massachusetts CO_2 Budget Trading Program requirements of 310 CMR 7.70, the facility, once operating, will be subject to the greenhouse reporting requirements pursuant to 310 CMR 7.71(3)(a)2 since the facility will emit more than 5,000 short tons of greenhouse gases in carbon dioxide equivalents during a calendar year. Therefore, the facility will be required to report, certify, and verify direct emissions of greenhouse gases pursuant to 310 CMR 7.71(5), (6), (7) and (9). The CO_2 emissions from the facility (boiler) have been estimated by PRE to be 434,737 tons per year based on 8,760 hours of operation per year. The value used in the greenhouse gas analysis for the MEPA Notice of Project Change was lower (393,476 tons per year) based on an expected actual 90% annual capacity factor.

G. Title IV Sulfur Dioxide Allowances and Monitoring

The Title IV Acid Rain Program effects reductions of sulfur dioxide (SO_2) from existing power plants by allocating SO_2 allowances to existing power plants and by requiring new plants to purchase SO_2 allowances to offset their SO_2 potential to emit.

The facility is subject to the Title IV Acid Rain Program of the 1990 Clean Air Act Amendments because the stoker boiler is considered a "New Affected Unit" which will be capable of producing more than 25 MW of electricity and will sell 100% of its output to the electric transmission grid pursuant to 40 CFR Part 72.6. Therefore, PRE will be required to submit a Title IV acid rain permit application 24 months prior to the date on which the stoker boiler expects to commence operation pursuant to 40 CFR Part 72.30(b)(2). PRE will be required to obtain SO_2 allowances upon start-up of the facility. Once the facility commences operation, it will be required to hold enough allowances, after deductions that are no less than the total annual emissions of SO_2 for the previous calendar year from the facility.

PRE will be required to have a Designated Representative (DR) and to install a Continuous Emissions Monitoring System (CEMS) to service the proposed facility. The DR is PRE's facility representative responsible for submitting required permits, compliance plans, emissions monitoring reports, offset plans, and compliance certification, and is responsible for the requirements specified in 40 CFR Part 75 for monitoring and/or reporting SO_2, NO_x and CO_2 emissions as well as opacity and heat input at the proposed facility. In addition, pursuant to 40 CFR 75.13, CO_2 emissions may be estimated in accordance with 40 CFR Part 75 Appendix G or Appendix F, in lieu of installing a CO_2 CEMS. PRE will also be required to submit a complete, electronic, up-to-date monitoring plan no later than 45 days prior to initial certification test as required by 40 CFR 75.62.

PRE shall comply with all applicable provisions of Title IV, including the following:

40 CFR Part 72 Permits Regulations
40 CFR Part 73 Sulfur Dioxide Allowance System
40 CFR Part 75 Continuous Emissions Monitoring
40 CFR Part 77 Excess Emissions

H. Title V Operating Permit

Even though the facility is not a major source of any regulated air pollutant, a Title V operating permit is required pursuant to 310 CMR 7.00: Appendix C(2)(a)4. as the facility is an affected source as defined in 42 U.S.C. 7401, Title IV (acid rain provisions). Therefore, PRE shall file an application for an Operating Permit no later than 12 months after the commencement of operation pursuant to 310 CMR 7.00, Appendix C(4)(a)5.

I. Risk Management Plan for Ammonia

Because the HRSCR will be employed to control NO_x emissions from the stoker boiler, it will be necessary to store aqueous ammonia on-site. The HRSCR is designed to use aqueous ammonia at concentrations of less than 19.5% and thus the ammonia storage tank will not be subject to the EPA's Accidental Release Program under 40 CFR Part 68. However, the provisions of Section 112(r) of the Clean Air Act include a "general duty clause" that requires such facilities to be designed and operated in a manner that prevents the release of ammonia and that minimizes the consequences of an accidental release.

The aqueous ammonia will be stored in an aboveground 14,000 gallon double-walled aqueous ammonia storage tank. The tank and the ammonia pump skid will be situated within a concrete diked area which is able to contain 110% of the volume of the tank. To minimize evaporation in the highly unlikely event of a release into the diked area, multiple layers of passive evaporative controls (plastic ball-like baffles) will be installed to reduce the surface area by 90%.

A worst-case accidental release scenario analysis was performed to evaluate the potential health impacts at the nearest offsite receptor for a release of the entire contents of the tank into the surrounding concrete dike with passive evaporative controls.

The American Industrial Hygiene Association has developed Emergency Response Planning Guidelines (ERPGs) for ammonia and other substances. The ERPG-2 represents the concentration below which it is believed nearly all individuals could be exposed for up to one hour without irreversible or serious health effects. The ERPG-2 for ammonia is 200 ppm. EPA has adopted the ERPG-2 as the toxic endpoint for ammonia for the offsite consequence analysis.

The emissions and impacts of the worst-case release scenario were based on the ALOHA model (Areal Locations of Hazardous Atmospheres) which is included as a prescribed technique under the EPA Risk Management Plan Guidance. The results of the ALOHA Model indicate that in the event of a worst-case release, the ammonia concentration will not exceed the ERPG-2 level of 200 ppm at any offsite public receptors such as residences, institutions, parks, recreational areas, major industrial, commercial, or office buildings.

IV. Best Available Control Technology (BACT) Analysis

The 509 MMBtu/hr biomass-fired advanced stoker boiler will emit the following air pollutants: NOx, CO, VOCs, SO_2, PM, PM_{10}, $PM_{2.5}$, ammonia and HAPs. Each of these pollutants has been evaluated in the following paragraphs for compliance with the applicable requirements of BACT.

A. NOx BACT

Control technologies for evaluation in this BACT analysis to control NO_x emissions from the wood-fired stoker boiler consist of:

- Selective Catalytic Reduction (SCR) including high efficiency regenerative selective catalytic reduction (HRSCR)
- Selective Noncatalytic Reduction (SNCR); and
- Combustion Controls

All of the above NOx controls are technically feasible control alternatives for wood-fired boilers; however, SCR controls are known to achieve higher reduction efficiencies for NOx emissions. Until very recently, there were no SCR installations on wood-fired boilers in the United States due to the problems of blinding and deactivation of the catalyst from alkaline compounds in the biomass fuels.

PRE has proposed that the NOx emissions from the stoker boiler will be controlled by a combination of combustion controls (staged combustion and overfire air) and a Babcock Power Environmental, Inc. SCR also known as a high efficiency regenerative selective catalytic reduction (HRSCR) system. The HRSCR is capable of achieving a NOx removal efficiency of greater than 90% and has a highly efficient direct heat transfer which results in an overall heat recovery of greater than 95% which is why it is called a regenerative SCR. This system is a "cold-side" or "tail-end" SCR which will be located downstream from the particulate matter control device. Placing the HRSCR system on the "hot-side" or upstream of the particulate matter control device, where the flue gas exhaust stream is at the optimum temperature range of 600°F to 800°F for the catalyst to chemically reduce the mixture of NO_x gas and injected ammonia (NH_3) reagent to nitrogen gas and water, is technically infeasible for this application because the flue gas is heavily laden with alkali/alkaline metallic compounds and causes rapid catalyst deactivation. The alkaline nature of wood ash has been known to deactivate the SCR catalyst by poisoning and fouling. Poisoning is the main cause of catalyst deactivation since alkaline salts, that grow into the pores of the catalyst, and sodium cause irreversible poisoning. Vendors currently view a "hot-side" SCR as technically infeasible and will not offer it for wood-burning applications.

The "cold-side" SCR, or HRSCR, is located downstream of the particulate matter control device and consists of a 2-canister system with one layer of catalyst per canister. The flue gas temperature at this location is lower than the required temperature range of 600°F to 800°F for optimum catalytic reduction in the "hot-side" SCR system, so a natural gas-fired duct burner is used to provide supplemental fuel to increase the flue gas temperature to the appropriate range. The HRSCR also includes four heat recovery beds full of ceramic media which are connected to the two central catalyst canisters via ductwork and dampers. The central canisters also include burners to heat the flue gas. Prior to the flue gas entering the catalyst canisters, ammonia is injected to ensure it is well mixed with the flue gas. Then the flue gas enters one of the ceramic canisters where the hot ceramic bed increases the temperature of the flue gas to a maximum of 650°F prior to passing through the catalyst bed. The final flue gas reheat temperature will be based upon optimization after startup. After the flue gas has passed through the catalyst bed, the heated gas enters the central catalyst canister where the internal duct burner further elevates the gas temperature about 10°F. This offsets the heat loss from the unit and the energy lost in the exiting flue gas. The heated flue gas then flows downward through another heat recovery ceramic bed. The ceramic beds are heated by the flue gases before leaving the HRSCR unit at a reduced temperature. The resulting exit gas temperature is only slightly higher than the flue gas entering the HRSCR. After a predetermined cycle time has passed, the flow direction is reversed so inlet gas passes through a freshly heated bed and the exhaust gas is passed through a cooled bed.

According to PRE, the combustion controls in conjunction with the HRSCR have been designed to meet a NOx emission rate of 0.055 lb/MMBtu based on a 1-hour block average, 0.017 lb/MMBtu based on any 12 consecutive month average. The HRSCR will also be equipped with instrumentation to continuously monitor and record the inlet temperatures to the HRSCR.

PRE's proposed NOx emission rates are more stringent than any existing BACT or LAER determination for a similar sized biomass-fired boiler. This has been verified by evaluating EPA's

RACT/BACT/LAER Clearinghouse (RBLC) and other similar sized biomass-fired power plants which have been recently approved. The other existing biomass-fired power plants reviewed, in addition to those contained in the RBLC, included Schiller Station Unit 5 in New Hampshire which uses SNCR, Whitefield Power & Light in New Hampshire (15 MW) which uses a RSCR and Boralex Stratton Energy in Maine (50 MW) which also uses RSCR. According to PRE, the Whitefield, New Hampshire and Maine plants all have RSCRs installed in 2004 by Babcock Power which were guaranteed to achieve a NOx emission rate of 0.075 lb/MMBtu and an ammonia slip of 20 ppm corrected to 3% O_2. The Schiller Station Plant has a NOx short-term emission limit of 0.075 lb/MMBtu based on a 24-hour average and an ammonia slip of 10 ppm @ 7% O_2.

Three other biomass-fired power plants were reviewed which have received approvals but have yet to complete construction. These three plants are Plainfield Renewable Energy (37.5 MW) in Connecticut which uses SNCR, Russell Biomass, LLC (740 MMBtu/hr) in Russell, Massachusetts which uses RSCR and Laidlaw Berlin BioPower, LLC (70 MW) in New Hampshire which uses a cold SCR system. In April 2008, Connecticut issued a permit to Plainfield Renewable Energy (37.5 MW) using SNCR with a NOx emission rate of 0.075 lb/MMBtu and an ammonia slip of 20 ppm @ 7% O_2. MassDEP issued a Plan Approval #1-P-05-046 dated December 30, 2008, for a 50 MW wood-fired unit for Russell Biomass, LLC (740 MMBtu/hr) in Russell, Massachusetts which approved a RSCR and a NOx emission rate of 0.06 lb/MMBtu as satisfying BACT and LAER as well as an ammonia slip of 13 ppmvd corrected to 3% O_2 as BACT. Most recently, New Hampshire issued, on July 26, 2010, a PSD and Non-Attainment New Source Review Permit #TP-00054 to Laidlaw Berlin BioPower, LLC (70 MW) that approved PSD-BACT and LAER for NOx as 0.06 lb/MMBtu on a 30-day rolling average basis. Therefore, PRE's proposed NOx emission rate results in lower/more stringent emission rates as compared with the most recently approved rates for Laidlaw Berlin BioPower, LLC and Russell Biomass, LLC and more stringent than any other biomass-fired power plant contained in EPA's RACT/BACT/LAER Clearinghouse.

Therefore, BACT for NOx is the use of combustion controls consisting of staged combustion and overfire air as well as a one layer, 2-canister HRSCR system capable of achieving a NOx emission rate of 0.055 lb/MMBtu based on a 1-hour block average, 28 pounds per hour based on a 1-hour block average, 0.017 lb/MMBtu based on any 12 consecutive month average and 37.9 tons in any 12 consecutive month period as well as an ammonia slip rate of 13 ppmvd corrected to 3% O_2. PRE has also proposed that they will monitor the NOx emissions using a continuous emission monitoring system.

B. CO BACT

Control technologies for evaluation in this BACT analysis to control CO emissions from the wood-fired stoker boiler consist of:

- Oxidation Catalysts; and
- Combustion Controls.

Both an oxidation catalyst and combustion controls are technically feasible for the control of CO emissions from wood-fired boilers. However the performance of the oxidation catalyst is dependent upon the temperature zone in which it is located. Because of the operating temperature requirement, the application of oxidation catalysts have not been successfully applied since the appropriate temperature zone is located upstream of the particulate matter control device in a high ash-loading zone which creates catalyst deactivation issues similar to the SCR catalyst deactivation described above. However, the plugging and deactivation of the catalyst can be avoided by placing the CO

oxidation catalyst downstream of the fabric collector and inside the HRSCR system. At this location the flue gas temperature is not hot enough for an oxidation catalyst to work, but the ceramic beds inside the HRSCR system will reheat the flue gas to the appropriate temperature. This location will also mitigate any CO formed in the HRSCR's duct burner.

Based on the above technical feasibility analysis for CO controls, PRE proposes to use good combustion practices and an oxidation catalyst within the HRSCR to achieve a 75-80% reduction of CO for an emission rate of 0.114 lb/MMBtu based on a 1-hour block average, 0.07 lb/MMBtu based on a 4-hour block average, 0.0365 lb/MMBtu based on a 12 consecutive month annual average, and 81.4 tons in any 12 consecutive month period. The 4-hour averaging period is necessary due to variations in the fuel moistures which can vary from 30% to 50%. The sudden increases in fuel moisture can cause higher CO emissions that can result in 1-hour or longer average spikes from the boiler above the normal operating condition where the boiler is at an uncontrolled emission rate of 0.25 lb/MMBtu.

The proposed CO emission rate results in a lower/more stringent annual CO emission rate than compared with the approved rate for Russell Biomass, LLC and more stringent than any other biomass-fired power plant contained in EPA's RACT/BACT/LAER Clearinghouse (see Table 4-2 in the amended NMCPA dated September 30, 2010). The proposed CO emission rate is also more stringent than the rate for Laidlaw Berlin BioPower, LLC (issued July 26, 2010) which was 0.075 lb/MMBtu based on a calendar day average and approved as BACT for PSD. PRE has also proposed that they will conduct a 1-year optimization period that will measure the actual CO emission performance to determine final 1-hour and 4-hour average emission rates which will be no less stringent than the proposed BACT emission rate.

Therefore, BACT for CO is the use of good combustion practices in combination with a CO oxidation catalyst inside the HRSCR unit to meet a CO emission rate of 0.114 lb/MMBtu based on a 1-hour block average, 58 pounds per hour based on a 1-hour block average, 0.07 lb/MMBtu based on a 4-hour block average, 35.6 pounds per hour based on a 4-hour block average, 0.0365 lb/MMBtu based on a 12 consecutive month annual average and 81.4 tons in any 12 consecutive month period. PRE has also proposed that they will monitor the CO emissions using a continuous emission monitoring system.

C. Volatile Organic Compounds BACT

Control technologies for evaluation in this BACT analysis to control VOC emissions from the wood-fired stoker boiler consist of:

- Oxidation Catalysts; and
- Combustion Controls.

The above control technologies are both technically feasible for the control of VOC emissions from wood-fired boilers. Therefore, PRE has proposed to use good combustion practices and an oxidation catalyst within the RSCR to achieve a VOC emission rate of 0.005 lb/MMBtu. The proposed VOC emission limit is as stringent as all permitted and operating wood-fired facilities (see Table 4-3 in the CPA dated September 30, 2010) and is equivalent to Schiller Station in New Hampshire which has the lowest VOC emission rate for any existing wood-fired power plant. The proposed VOC emission rate is more stringent than the April 2007 MassDEP Best Available Control Technology Guidance – Biomass-Fired Electric Generating Units – Table 2. Therefore, BACT for VOCs is the use of good combustion controls in conjunction with an oxidation catalyst capable to meet a VOC

emission rate of 0.005 lb/MMBtu, 2.545 pounds per hour and 11.15 tons in any 12 consecutive month period. Compliance with the short-term VOC emission rates will be based on the average of three 1-hour stack tests.

D. Particulate Matter, PM_{10} and $PM_{2.5}$ BACT

Control technologies for evaluation in this BACT analysis to control PM, PM_{10} and $PM_{2.5}$ emissions from the wood-fired stoker boiler consist of:

- Fabric collector and electrostatic precipitators (ESPs);
- Dry circulating fluid bed scrubber; and
- Multiclones.

All of the above control devices are technically feasible control alternatives for wood-fired boilers. However, dry scrubbers and mechanical collectors are typically used in conjunction with other PM control technologies such as ESPs or fabric collectors. Although the majority of wood-fired boilers have favored ESPs for particulate control due to fire-related concerns with fabric collectors, a few fabric collectors have been put in operation in the past few years. In general, fabric collectors are considered slightly superior to ESPs for PM control, especially for fine PM control. For purposes of this BACT review, the $PM_{2.5}$ emissions have been assumed to be equivalent to PM_{10}.

For this boiler design, PRE has proposed to incorporate the use of a Babcock Power Environmental Inc., or equivalent, dry circulating fluid bed scrubber (dry scrubber) in conjunction with a SP Environmental, or equivalent, fabric collector in order to achieve the highest removal control efficiency for PM, PM_{10} and $PM_{2.5}$. A multiclone or mechanical collector will not be necessary in this design since a dry scrubber will be located between the boiler and baghouse to alleviate any fire concerns by water quenching the exhaust gas temperature to 215°F and by providing additional scrubbing of the flue gas. The use of a dry scrubber will also promote condensation of various compounds onto the solid material that can then be efficiently removed by the fabric collector instead of condensing as PM_{10} in the atmosphere. The dry scrubber will be equipped with instrumentation to continuously monitor and record the reagent flow rate.

The proposed SP Environmental, or equivalent, fabric collector will be equipped with six compartments, each with 310 Ryton felt or woven fiberglass bags with a polytetrafluoroethylene (PTFE) membrane, a maximum air flow of 198,000 ACFM, a filtering surface area of 37 ft^2 per bag, a net air to cloth ratio of 3.48:1 with one compartment offline for cleaning, a gross air to cloth ratio of 2.9:1 with all compartments operating and instrumentation to continuously monitor and record the differential pressure across the fabric collector. The fabric collector will also be equipped with instrumentation to continuously monitor and record the inlet temperature to the fabric collector. A pulse jet cleaning system will be used for cleaning the fabric filters.

Based on the above technical feasibility analysis for PM and PM_{10} controls, PRE proposes to use a Babcock Power Environmental Inc., or equivalent, dry circulating fluid bed scrubber (dry scrubber) in conjunction with a SP Environmental, or equivalent, fabric collector to achieve a total filterable PM, including PM_{10}, emission rate of 0.008 lb/MMBtu and a total PM_{10} (filterable and condensable) emission rate of 0.015 lb/MMBtu since the condensable PM_{10} is estimated to add 0.007 lb/MMBtu based on 20% conversion of SO_2 to SO_3 over the CO oxidation catalyst, and reaction with ammonia slip to form ammonium sulfate after the fabric collector and HRSCR. PRE's total filterable PM and total PM_{10} emission rate is more stringent than any other biomass-fired power plant contained in EPA's RACT/BACT/LAER Clearinghouse (see Table 4-4 in the CPA dated September 30, 2010).

Therefore, BACT for PM, PM_{10} and $PM_{2.5}$ is the use of the dry circulating fluid bed scrubber (dry scrubber) in conjunction with a SP Environmental, or equivalent, fabric collector to meet a total filterable particulate matter emission rate, including PM_{10}, of 0.008 lb/MMBtu, 4.072 pounds per hour and 17.84 tons in any 12 consecutive month period as well as to meet a total PM_{10} (filterable and condensable) emission rate of 0.015 lb/MMBtu, 7.635 lb/hr and 33.44 tons in any 12 consecutive month period. Compliance with the short-term total filterable particulate matter and total PM_{10} emission limits will be based on the average of three 1- hour stack tests.

Since particulate matter can be used as a surrogate (with carbon monoxide) to demonstrate good combustion and HAP control, MassDEP feels strongly that a filterable particulate matter CEM would be a useful monitoring device for this application. Based on these concerns, PRE has proposed to include the use of a filterable particulate matter CEM.

In addition to the PM, PM_{10} and $PM_{2.5}$ emission rate limitations, the stoker boiler will have an opacity limitation of not to exceed 10% at any time (not including periods of startup and shutdown). This determination was based on the highly efficient capabilities of the proposed air pollution control equipment to minimize visible emissions as well as the fact that the same opacity limitation was established as MACT and BACT for Russell Biomass, LLC in Plan Approval #1-P-05-046 dated December 30, 2008. PRE has requested that the use of a continuous opacity monitor (COM) be waived since 40 CFR Subpart Db does not require a COM if a PM CEM is being used. However 310 CMR 7.04(2) requires a fuel utilization facility equal to or greater than 40 MMBtu/hr to be equipped with a smoke density sensing device regardless of the Subpart Db requirement. In some cases 310 CMR 7.04(2) has been waived due to technical feasibility issues when using an opacity monitor on high temperature exhaust stacks from simple cycle combustion turbines, but stack exhaust temperature is not an issue with the PRE stoker boiler. Therefore, MassDEP will require the opacity to be monitored using a continuous opacity monitoring system pursuant to 310 CMR 7.04(2).

PRE has also proposed that the 3-sided shed will be ventilated at approximately 60,000 acfm with the exhaust stack at 51 feet above ground level. The storage shed stack will have an opacity limitation of 0% at any time.

E. Sulfur Dioxide BACT

Control technologies for evaluation in this BACT analysis to control SO_2 emissions from the wood-fired stoker boiler consist of:

- Wet scrubbers;
- Dry scrubbers (dry circulating fluid bed scrubber);
- Low sulfur fuels; and
- Good combustion practices

Emissions of SO_2 from fuel combustion result from the oxidation of sulfur compounds present in the fuel. Emissions of SO_2 from wood-fired boilers are inherently minimized by the low sulfur content of the biomass fuel. The SO_2 emissions in the flue gas stream can be further minimized by the use of add-on control devices such as flue gas desulfurization (FGD) or scrubber systems (wet or dry) which have been used on sulfur-laden fuels like coal and residual oil. Wet scrubbers use a wet sorbent to react with the sulfur resulting in a wet solid by-product that may require additional

treatment prior to disposal or sale. Dry scrubbers remove SO_2 as a dry solid by-product that requires collection by downstream particulate control equipment.

PRE has proposed that BACT for SO_2 is the use of a Babcock Power Environmental Inc., or equivalent, dry circulating fluid bed scrubber (dry scrubber) in conjunction with a SP Environmental, or equivalent, fabric collector, the use of natural gas as a supplemental fuel for boiler start-up and flame stabilization as well as the use of good combustion practices. Vendor information from Babcock Power Environmental indicates that the dry scrubber can maintain greater than 97% SO_2 removal efficiency. PRE has also proposed that the boiler can achieve a SO_2 emission rate of 0.02 lb/MMBtu based on a 1-hour block average. This emission rate is lower than the permitted emission rate for any wood-only unit and equal to the lowest permitted emission rate for a wood unit co-fired with a higher sulfur fuel contained in EPA's RACT/BACT/LAER Clearinghouse (see Table 4-5 in the CPA dated September 30, 2010). The proposed emission rate is also in compliance with the April 2007 MassDEP Best Available Control Technology Guidance – Biomass-Fired Electric Generating Units – Table 2.

Therefore, BACT for SO_2 is the use of the dry circulating fluid bed scrubber (dry scrubber) in conjunction with a SP Environmental, or equivalent, fabric collector, the use of natural gas as a supplemental fuel for boiler start-up and flame stabilization as well as the use of good combustion practices to meet a SO_2 emission rate of 0.02 lb/MMBtu based on a 1-hour block average, 10.2 pounds per hour based on a 1-hour block average, 0.012 lb/MMBtu based on a 12 consecutive month average and 26.8 tons in any 12 consecutive month period. PRE has also proposed that they will monitor the SO_2 emissions using a continuous emission monitoring system.

F. Boiler Ammonia BACT

Emissions of ammonia from the wood-fired stoker boiler are created from excess reagent (ammonia) passing through the catalyst reactor. This excess reagent is referred to as ammonia slip which can be emitted if the reaction temperature for the HRSCR system is too low. Too low a reaction temperature will prevent all of the ammonia from reacting with the NOx emissions, thus creating ammonia slip. Additionally, ammonia slip does not remain constant as the HRSCR operates, but increases as the catalyst activity decreases. It is initially low when the catalyst is new and increases up to the design limit at the end of the catalyst's life.

BACT for ammonia is an emission rate that ensures minimal NOx but is still low enough to prevent health risks from low-level ammonia exposure and prevents problems associated with ammonium sulfate emissions. The vendor's guaranteed ammonia slip is 13 ppmvd at 3% O_2 based on a 1-hour block average, 0.006 lb/MMBtu based on a 1-hour block average, 3.1 lb/hr based on a 1-hour block average and 13.4 tons in any 12 consecutive month period. The above ammonia emission rate is tied to the guaranteed NOx emission rate and is considered BACT for ammonia. Russell Biomass, LLC was also approved with a similar ammonia slip emission rate as BACT. PRE has also proposed that they will monitor the inlet temperature to the HRSCR as well as the ammonia emissions using a continuous emission monitoring system.

G. Facility Fugitive Particulate Matter Emission BACT

Fugitive particulate matter emissions from the PRE facility will be negligible since all material processing and handling (screening, grinding, conveying) operations will be within enclosed areas except for the wood fuel deliveries and the northside opening of the wood fuel storage shed. The potential for dust from the storage shed will be minimized by the use of a water suppression system consisting of a disc fan water mister to be located at the head of the last stockout conveyor (stock-out

conveyor #4) and will be used, as needed, to moisten the surface of the wood as it drops onto the pile. Water will be supplied from the plant's service water system and the water lines to the misting system will be winterized by being electrically heat traced and insulated. In addition, the roads will be paved and a maximum speed limit of 10 miles per hour will be posted. A vacuum-type road sweeper (or equivalent as determined by MassDEP) will be maintained on-site and utilized as necessary to keep roads clean. Therefore, MassDEP has determined that the above mentioned best management operating practices are BACT for the minimization of fugitive particulate matter from the delivery and movement of the wood chips at PRE.

H. Hazardous Air Pollutants BACT

The facility is not a major source of HAPs; however, the HAP emissions must still comply with BACT. HAP emissions from the boiler can be broken down into organic HAPs, metal HAPs and hydrogen chloride. The physical and chemical characteristics of green wood as well as the combustion of these fuels and the associated HAP emissions from the facility have been based on several sources such as:

- EPA AP-42, Fifth Edition Compilation of Air Pollutant Emission Factors, Section 1.6, Wood Residue Combustion in Boilers, Update September, 2003.
- Major Comprehensive Plan Approval Plan Approval # 1-P-05-046 for Russell Biomass, LLC, issued December 30, 2008.
- Phyllis, database for biomass and waste, http://www.ecn.nl/phyllis, Energy Research Centre of the Netherlands

Organic HAPs, which are considered to be all VOCs, are created during the combustion of the wood fuel and are best controlled by the use of good combustion controls in conjunction with the use of an oxidation catalyst in the HRSCR which is identical to the control of VOC emissions previously discussed. The organic HAP emission rates do not exceed any of the applicable MA AALs or TELs.

PRE has proposed to control the metallic compound HAPs, which are considered to be PM at exhaust gas temperatures and are mostly PM-2.5, by the use of only clean wood fuel (eliminating treated wood that may contain copper, chromium, and arsenic) which incorporates PRE's wood fuel specification limits as well as through the use of add-on controls for particulate matter which will consist of a dry scrubber and a fabric collector for the proposed stoker design boiler. PRE has proposed that these control devices will have a combined metal HAP removal efficiency of 99% or greater depending on the specific HAP. The metal HAP removal efficiency of 99% or greater also meets the April 2007 MassDEP Best Available Control Technology Guidance – Biomass-Fired Electric Generating Units – Table 2 and the metal HAP emission rates do not exceed any of the applicable MA AALs or TELs. In addition, the emission of mercury will not exceed 1.2×10^{-6} lb/MMBtu and 5.36 pounds in any 12 consecutive month period and the emission of lead will not exceed 2×10^{-5} lb/MMBtu and 89.2 pounds in any 12 consecutive month period. PRE's proposed short-term emission rates for mercury are equivalent to Russell Biomass, LLC and the lead emission rates are more stringent as compared to Russell Biomass, LLC. Therefore, BACT for metal HAP emissions will be the combined use of a dry scrubber and fabric collector which can achieve the removal efficiency and emission limitations as specified above.

The control of inorganic HAPs and minimization of HCl will be accomplished, in part, by the use of only clean wood fuel in the boiler (eliminating C&D wood and plastics which may contain chlorine

in high concentrations). HCl will be further controlled by the use of a dry scrubber and a fabric collector. The emission of HCl emission from the stoker boiler will not exceed 0.000834 lb/MMBtu and 1.86 tons per year in any 12 consecutive month period. In comparison, Russell Biomass has a short term HCl emission rate of 0.0035 lb/MMBtu and an annual emission rate of 11.4 tons per year. Laidlaw Berlin BioPower, LLC (issued July 26, 2010) has a short term HCl emission rate of 0.000834 lb/MMBtu. Therefore, PRE's emission rates are more stringent as compared to Russell Biomass and identical to Laidlaw Berlin BioPower. Additionally, the proposed HCl emission rate is well below the HCl guideline of 20 ppm @ 3% O_2 (~0.02 lb/MMBtu) contained in the April 2007 MassDEP Best Available Control Technology Guidance – Biomass-Fired Electric Generating Units – Table 2 and the HCl emission rates do not exceed the MA AALs or TELs. Therefore, BACT for HCl will be the use of the fuel specification limit in conjunction with the use of the dry scrubber and fabric collector which can achieve the emission limitations as specified above.

In addition to the above discussed individual HAP emission limits, the stoker boiler will have a total HAP emission limit of 13.2 tons in any 12 consecutive month period and an individual HAP emission limit of 4.15 tons in any 12 consecutive month period which is based on the total HAPs provided in Table 4-6 (revised November 30, 2010) in the CPA dated September 30, 2010. Initial stack testing shall be required to be performed for antimony, arsenic, beryllium, total chromium, chromium (VI), cadmium, cobalt, lead, nickel, manganese, phosphorus, selenium, mercury, HCl and all organic HAPs.

Representative as-fired wood samples will be taken at the time of the HAP stack tests to accurately determine the HAP content of the wood fired during the testing. These stack tests will be repeated on a yearly basis. The permittee may request a change in frequency of testing and in the type of constituents tested once enough data has been generated to determine the consistency of the results.

V. Ambient Air Quality Impact Analysis

This section documents the results from an air quality computer dispersion modeling analysis performed using USEPA approved AERMOD model (version 09292) for the proposed stoker design boiler, lime silo, ash silo, wood storage shed and on-site fugitive particulate matter emissions to demonstrate that the predicted air quality impacts associated with the construction and operation of the source will comply with applicable NAAQS and MassDEP's air toxics limits for non-criteria pollutants. The air quality analysis was reviewed by MassDEP.

The boiler design was evaluated at a clean wood load of 100%. The PM_{10} and $PM_{2.5}$ emissions from the boiler included filterable plus condensable emissions and the $PM_{2.5}$ emissions were assumed to be equal to the total PM_{10} (filterable plus condensable) emission. The boiler's stack height of 275 feet above ground level was determined to be GEP stack height; therefore, building downwash effects were not required for the air quality modeling analysis.

In addition to the emissions from the boiler stack, PM_{10} and $PM_{2.5}$ emissions from the lime silo, ash silo, wood storage shed and on-site fugitive particulate matter emissions were included in the air quality modeling analysis.

Type of Model

The refined air quality analysis was performed with EPA's AERMOD model (version 09292), using EPA's recommended regulatory default options and rural dispersion coefficients. Land use around the proposed site indicated that a rural dispersion environment was appropriate for the modeling analysis.

Meteorological Data
Five years of surface meteorological data (1991 through 1995) from Westover Air Force Base (AFB) in Chicopee, Massachusetts and five years of upper air data from Albany, New York (1991 through 1995) were employed. Meteorological data for AERMOD runs were prepared with EPA's AERMET meteorological processing model using land use surface characteristics (Albedo, Bowen Ratio and surface roughness) prepared with EPA's AERSURFACE processor for one 360 degree wind sector around Westover AFB. The Westover AFB is located 7 miles to the north of the plant site at an elevation of 246 feet above mean sea level. The AFB station is the closest site for which extensive meteorological data is available and is representative of similar topographic influences that affect the proposed site.

Selected Air Quality Monitors
MassDEP air quality monitors in Springfield were used for estimating background concentrations for NO_2, PM_{10}, $PM_{2.5}$, CO and SO_2. For lead (Pb), the Kenmore Square monitor in Boston was used, which is the only lead monitor in the Commonwealth.

Receptor Network
A Cartesian grid receptor network consisting of 25,701 discrete receptors were employed for the modeling analysis. Receptors were located 50 meters apart out to 1000 meters, 100 meters apart from 1000 to 2500 meters, and 200 meters apart from 2500 to 15,000 meters. In addition, 177 receptors corresponding to the location of 177 public and private schools within 15 kilometers of the proposed facility were included. This receptor network was employed to estimate the maximum air quality impacts associated with emission from the boiler stack.

A second receptor network (400 meters by 450 meters space 10 meters apart) was used to estimate maximum combined impacts of PM_{10} and $PM_{2.5}$ for the boiler, lime silo, ash silo, wood storage shed and on-site fugitive particulate matter emissions.

Receptor elevations and height scales were determined with EPA's AERMAP terrain processor using USGS National Map Seamless server NED digital terrain data (1/3 Arc-second GeoTiff). The receptor network was considered to be adequate for predicting maximum air quality impacts due to combined PM_{10} and $PM_{2.5}$ emissions from the boiler, lime silo, ash silo, wood storage shed and on-site fugitive particulate matter emissions.

Background Air Quality
Model predicted air quality impacts were added to background concentrations to estimate the total air quality impact from the project. Air pollutant background concentrations were conservatively estimated for the air quality analysis. The methodology is consistent with EPA and DEP guidance and is described below.

To determine background pollutant levels representative of the area, the most recent air quality data reports prepared by MassDEP and data obtained from the EPA were reviewed. MassDEP guidance specifies the use of the most-recent 3-year period (2007-2009) of available monitoring data representative of the Project site. A summary of the air monitoring data and the selected background values are shown in Table 5-3 of the non-major comprehensive plan approval application dated September 30, 2010.

For CO, NO_2, SO_2, and PM_{10}, the background values for averaging periods of 24-hours or shorter were the highest concentration of the yearly observations. For the annual averages of these air pollutants, the highest yearly observation was used as the background concentration.

For $PM_{2.5}$, the average concentration of the 98th percentile value for three years was used for the 24-hour background and the average concentration of three years was used for the annual background concentration. These values are consistent with the form of the new $PM_{2.5}$ air quality standard.

EPA Significant Impact Levels (SILs)
The maximum predicted impacts for 1-hour CO concentrations, 8-hour CO concentrations, 3-hour SO_2 concentrations, 24-hour SO_2 concentrations, 24-hour PM_{10} concentrations, 24-hour $PM_{2.5}$ concentrations and annual average concentrations for SO_2, PM_{10}, $PM_{2.5}$ and NO_2 are all below EPA SILs. Impacts below EPA SILs are considered by themselves to be an acceptable demonstration of attainment with applicable NAAQS. Final EPA SILs for the new 1-hour NO_2 and SO_2 NAAQS have not yet been promulgated by EPA. Impacts of PM_{10} and $PM_{2.5}$ include the stoker boiler, lime silo, ash silo, wood storage shed and on-site fugitive particulate matter emissions.

Air Dispersion Modeling Results
Table 2 below presents the modeling results compared to the NAAQS. The modeling results were added to monitored background values and then compared to the NAAQS. For the long-term averaging periods (i.e. annual), the maximum annual modeled concentrations were obtained and added to monitored background values. For short-term averaging periods (i.e. 1-hour CO, 3-hour SO_2, 8-hour CO, 24-hour SO_2 and 24-hour PM_{10}) the highest second highest values were obtained and added to monitored background values. For $PM_{2.5}$, the highest 5-year average of the maximum 24-hour concentrations at each receptor was obtained and added to monitored background values per EPA guidance (March 2010).

EPA supplemented the existing annual NAAQS for NO_2 of 53 parts per billion (ppb) by establishing a new short-term standard based on the 3-year average of the 98th percentile of the yearly distribution of 1-hour average daily maximum concentrations. EPA set the level of the new standard at 100 ppb (188 microgram/m^3). The new standard became effective on April 12, 2010. Therefore, PRE also demonstrated that the operation of the stoker boiler will not cause or contribute to violations of the new 1-hour average NO_2 NAAQS of 100 ppb.

In addition, EPA has promulgated a new 1-hour SO_2 NAAQS based on the 3-year average of the 99th percentile of the yearly distribution of 1-hour average daily maximum concentrations. The new 1-hour SO_2 standard is 75 ppb (195 microgram/m^3). Therefore, PRE has also demonstrated that the operation of the stoker boiler will not cause or contribute to violations of the new 1-hour average SO_2 standard of 75 ppb.

The modeling results contained in Table 2 indicate that the worst case predicted modeled concentrations plus monitored background values are below the NAAQS for all averaging periods. The PM_{10} and $PM_{2.5}$ concentrations were modeled using two different scenarios. One scenario modeled the PM_{10} and $PM_{2.5}$ concentrations with the stoker boiler operating at 100% load. The second scenario modeled the PM_{10} and $PM_{2.5}$ concentrations with the stoker boiler operating at 100% load along with contributions from the lime silo, ash silo, wood storage shed and on-site fugitive particulate matter emissions. The PM_{10} and $PM_{2.5}$ concentrations contained in Table 2 represent the worst case from the two modeled scenarios.

Table 2 - SUMMARY OF CRITERIA POLLUTANT REFINED MODELING RESULTS (microgram/m^3)

Result and Criteria	NO_2 1-Hour	NO_2 Annual	SO_2 1-Hour	SO_2 3-Hour	SO_2 24-Hour	SO_2 Annual	PM_{10} 24-Hour	PM_{10} Annual	$PM_{2.5}$ 24-Hour	$PM_{2.5}$ Annual	CO 1-Hour	CO 8-Hour	Pb Rolling 3-mth	Pb Quarterly
Predicted Concentration:	9.36	0.04	5.89	3.59	0.63	0.04	2.44	0.65	0.51	0.12	55.79	5.72	9.4E-4	9.4E-4
Background Concentration:	146.64	31.96	153.40	88.40	41.60	8.32	57.0	18.4	29.37	10.5	3876	3420	0.01	0.01
Maximum Total Impact:	**156.00**	**32.00**	**159.29**	**91.99**	**42.23**	**8.36**	**59.4**	**19.0**	**29.9**	**10.6**	**3931.79**	**3425.72**	**0.01**	**0.01**
NAAQS:	188	100	195	1300	365	80	150	50	35	15	40,000	10,000	0.15	1.5
Percent of NAAQS:	83%	32%	81.7%	7.1%	11.6%	3%	39.6%	38%	85.4%	70.7%	9.83%	34.3%	6.7%	0.7%

Air Toxics Analysis

Projected concentrations of non-criteria pollutants were modeled and the maximum impacts over the five year meteorological period for the 100 percent boiler load condition were compared to the annual Allowable Ambient Limit (AAL) and the 24-hour Threshold Effects Exposure Limit (TEL). The AALs and TELs are emission concentrations established by MassDEP to be health protective from toxicity of non-criteria pollutants. As shown in Table 5-8 of the non-major comprehensive plan approval application dated September 30, 2010, the maximum modeled 24-hour and annual concentrations for each non-criteria pollutant are below all applicable MassDEP TELs and AALs.

Conclusion

The air contaminant emissions from the proposed PRE project will not cause or significantly contribute to violations of the NAAQS for SO_2, NO_2, PM_{10}, $PM_{2.5}$, CO and lead. Additionally, emissions from the stoker boiler will not exceed applicable DEP TELs and AALs.

VI. Noise Impact Analysis

A noise impact assessment was conducted to demonstrate that the proposed 35 MW (nominal net output) biomass-fired power plant in Springfield, MA will comply with requirements under 310 CMR 7.10, The DEP Division of Air Quality Control Policy Statement 90-001 (Noise Policy) and BACT. The MassDEP Noise Policy states that a noise source will be considered to be violating the Department's noise regulation (310 CMR 7.10) if the source does:

1. Increase the broadband sound level by more than 10 dB(A) above ambient.

2. Produce a "pure tone" condition - when any octave band center frequency sound pressure level exceeds the two adjacent center frequency sound pressure levels by 3 decibels or more.

These criteria are measured both at the property line and at the nearest inhabited residence. Ambient is defined as the background A-weighted sound level that is exceeded 90% of the time measured during equipment operating hours, this is also known as the L_{90}.

The biomass-fired power plant will be located on 7 acres of the existing 13 acre site; an existing asphalt plant will remain on site. The site is bounded by Page Boulevard (Route 20) and a Friendly's restaurant to the south, a residential community located to the east, a private roadway accessing a Western Massachusetts Electric Company (WMECO) service facility and printing company to the north, and WMECO electrical transmission lines and the Route 291/Route 20 interchange to the west. Current noise sources in the immediate vicinity of the plant include vehicular traffic from I-291 and Route 20 as well as the operations at the asphalt plant.

A. Measurement of Existing Ambient Sound Levels

Noise surveys were conducted to acoustically characterize the environment near the site and within the community. Ambient background sound level monitoring was conducted at three locations during both daytime and overnight periods. Two locations were near residences while one location was at the site property line.

The following table summarizes the noise monitoring locations.

Table 3 – Noise Monitoring Locations

Position	Description
Location 1	Northern Property Line – Industrial/Commercial
Location 2	Cadwell Drive -Residential wooded lot east of site
Location 3	Residence at Ronald Dr./Jean Dr.

Continuous measurements were taken at Location 1 and Location 2 which are the closest measurement locations to the site. These monitors continuously measured and stored hourly sound level statistics for 72 consecutive hours to determine the background noise levels with and without the asphalt plant operating. These monitors ran from 4:00PM Thursday, December 14, 2006 until 4:00PM on Sunday, December 17, 2006.

Short-term sound level measurements were made at all three locations. The weekday measurements were made for approximately 20 minutes per location on Thursday, December 14, 2006 from approximately 11:50AM to 1:35PM and weeknight sound level measurements were made for approximately 20 minutes per location from Thursday, December 14 to Friday, December 15, 2006 from approximately 11:50PM to 1:05AM. The weekend nighttime measurements were made for approximately 20 minutes per location from Saturday, December 16 to Sunday, December 17, 2006 from approximately 11:55PM to 1:05AM, and the weekend daytime measurements were made for approximately 20 minutes per location on Sunday, December 17, 2006 from approximately 2:45PM to 4:10PM. Since noise impacts are greatest when existing noise levels are lowest, the study was designed to measure nighttime community noise levels under conditions typical of a "quiet period" for the area.

B. Instrumentation

Short-term broadband and octave band ambient sound pressure level data was collected using CEL Instruments Model 593.C1 Precision Sound Level Analyzer. The CEL 593.C1 is equipped with a

CEL-257 Type 1 Preamplifier, a ½" electret microphone and a four-inch foam windscreen. This meter meets the "Type 1 – Precision" requirements set forth in the American National Standards Institute (ANSI) S1.4 for acoustical measuring devices. The measurement equipment was calibrated in the field before and after the surveys with a CEP-110/1 or equivalent acoustical calibrator which meets the standards of IEC 942 Class 1L and ANSI S1.40-1984.

Larson Davis model 812 sound level meters were used for the continuous monitoring. The model 812 meter meets Type 1 ANSI S1.4-1983 standards for sound level meters. The meters have been calibrated and certified as accurate to standards set by the National Institute of Standards and Technology by an independent laboratory within the past 12 months. The model 812 has data logging capability and was programmed to log statistical data every hour for the following parameters: L_1, L_{10}, L_{50}, L_{90}, L_{max} and L_{eq}.

The sound levels were measured at a height of five feet above the ground and at locations where there were no large reflective surfaces to affect the measured levels. The measurements were made under low wind conditions and with dry roadway surfaces.

C. Existing Ambient Sound Level Results

The results of the daytime and nighttime background ambient sound levels (L_{90}) are provided in Tables 6-2, 6-3 and 6-4 of the plan approval application. As shown in these tables, the short-term daytime background L_{90} measurements ranged from 48 dBA to 58 dBA and the short-term nighttime background L_{90} levels ranged from 44 dBA to 46 dBA. The 72-hour continuous background L_{90} measurements at Location 1 ranged from 43 dBA to 59 dBA and the 72-hour continuous background L_{90} measurements at Location 2 ranged from 46 dBA to 60 dBA.

D. Measurements of Future Sound Levels

The primary sources of sound resulting from the plant have been identified as an induced draft (ID) fan, booster fan, air-cooled condenser, boiler, steam turbine generator, and a transformer which have the potential to operate 24 hours a day. Additional daytime-only exterior sources consist of a front-end loader and a wood grinding operation. The loading of lime into a silo will also occur during the day, but this is not anticipated to occur more than once per week.

The plant has incorporated noise control in several aspects of its design to minimize noise impacts. Operations such as wood grinding, silo loading and the movement of wood material through the use of a front-end loader will be limited to the operating hours of 6AM to 10PM to minimize noise impacts at the nearby residences. Also, the wood grinder, boiler and steam turbine generator will be placed inside a metal housing which will greatly reduce sound associated with their operation. The HRSCR system will act as noise mitigation for the exhaust fan noise associated with the ID fan. A stack silencer will be installed to mitigate the noise associated with the exhaust stack. A casing and inlet box insulation will be used to attenuate the sound levels associated with the ID and booster fans.

Two future scenarios were modeled which were nighttime and daytime DEP compliance. Both scenarios included all operational sound sources at the facility except the front-end loader, wood grinding operations and the loading of the lime silo since they will only operate in the daytime period.

The Cadna/A (Computer Aided Noise Abatement) noise calculation model was used to predict the sound pressure level impacts associated with the plant. The acoustical model uses the International Standard ISO 9613-2 for sound propagation. It also includes the effects of topography, ground attenuation,

multiple building reflections, drop-off with distance and atmospheric absorption. The model was run using standard meteorology conditions of 68°F, 70% relative humidity and no wind.

The future maximum sound levels were calculated at 12 separate receptors. These were comprised of the three locations where the ambient monitoring data was collected, the property lines (four cardinal directions), the three closest residences on Cadwell Drive, the restaurant south of the site, the closest residence west of the site (west of Interstate 291), and the closest business north of the site. The following table specifies the modeling receptor locations.

Table 4 – Noise Monitoring Locations

Position	Description
Location 1	Northern Property Line – Industrial/Commercial
Location 2	Cadwell Drive -Residential wooded lot east of site
Location 3	Residence at Ronald Dr./Jean Dr.
Location 4	Residence at Cadwell Dr./Curve St.
Location 5	Cadwell Dr. Residence
Location 6	Cadwell Dr. Residence
Location 7	Property line – West
Location 8	Property Line – South
Location 9	Property Line – East
Location 10	Restaurant – South
Location 11	Residence West of 291
Location 12	Business North of Site

The results from the future maximum sound levels at the nearest sensitive receptors for the daytime and nighttime MassDEP compliance scenarios are provided in the following table.

Table 5- MassDEP Noise Policy Compliance Demonstration for Operational Sound (dBA)

Receptor Location	Min. L_{90} Background Day/Night	Facility Sound Day/Night	Combined Level Day/Night	Net Increase Day/Night
Location 1	46/43	55/55	56/55	10/12
Location 2	50/46	49/42	53/47	3/1
Location 3	48/44	39/37	49/45	1/1
Location 4	50/46[1]	45/44	51/48	1/2
Location 5	50/46[1]	50/45	53/49	3/3
Location 6	50/46[1]	52/44	54/48	4/2
Location 7	46/43[2]	64/51	64/52	18/9
Location 8	46/43[2]	48/43	50/46	4/3
Location 9	50/46[1]	54/46	55/49	5/3
Location 10	50/46[1]	48/44	52/48	2/2
Location 11	46/43[2]	35/32	46/43	0/0
Location 12	46/43[3]	50/48	51/49	5/6

1 The daytime and nighttime L_{90} is assumed to be equal to the L_{90} at Location 2
2 The daytime and nighttime L_{90} is assumed to be the lower of the sound levels at Locations 1 and 2.
3 The daytime and nighttime L_{90} is assumed to be equal to the L_{90} at Location 1.

The results contained in Table 5 above demonstrate that the predicted changes in sound pressure levels resulting from the operation of the biomass-fired power plant at the closest noise sensitive areas will be in full compliance with the 10 dBA incremental limit contained in MassDEP's Noise Policy. However, at the northern and western property lines the sound pressure level modeling predicts increases above 10 dBA. These locations are not noise-sensitive land uses since the abutting properties west of the site property line are a transmission R-O-W and an on-ramp to I-291. The northern property line is a roadway and the actual commercial building is 150 ft or more beyond the property line. The modeling analysis at this commercial building (location 12) indicates a less than 10 dBA increase. In these two instances, MassDEP is willing to accept letters of acceptance of the 10 dBA increase from the abutting property owners. Letters dated July 17, 2008 and July 22, 2009 were received from Bassette Company and Western Massachusetts Electric Company which indicated that both companies had no issues with the 10dBA increase over the background sound levels.

The daytime and nighttime predicted cumulative sound pressure level results for the octave band (tonal) compliance assessment showed that no octave band level exceeds an adjacent octave band level by 3 decibels at any of the closest noise sensitive areas. However, at the western property line a pure tone at 63 Hz was predicted during the daytime only. This pure tone is only predicted to occur during the operation of the limestone blower. The limestone blower will only operate for two hours, approximately twice per week. In this instance, MassDEP is willing to accept a letter of acceptance for the infrequent pure tone condition from the abutting Western property line owner. A letter dated July 22, 2009 from Western Massachusetts Electric Company indicated that the company had no issues with the pure tone condition. Therefore, the project will also comply with the tonal requirements of the MassDEP Noise Policy.

In conclusion, the noise impact analysis has demonstrated that the proposed biomass-fired power plant design, including low noise equipment and proven noise mitigation technologies, will meet the applicable acoustic criteria at all residential locations. With the exception of the western and northern property lines which have been adequately addressed above, the operation of the proposed biomass-fired power plant, by employing BACT, will fully comply with the most stringent sound level limits set by The DEP Division of Air Quality Control Policy Statement 90-001, and will not result in a noise nuisance condition.

E. Noise Mitigation Controls

In order to comply with MassDEP noise policy and BACT, acoustical controls are incorporated into the design of the proposed facility. Although the specific type and amount of mitigation will be selected during the detailed design phase of the project, a successful noise control program will include, at a minimum, the following components:

- An industrial grade building shall enclose the boiler, turbine unit, wood grinding and auxiliary support equipment.
- A stack silencer shall be installed to mitigate the noise associated with the stoker boiler's exhaust stack.
- All on-site mobile equipment shall be equipped with exhaust mufflers and shall have low-noise, ambient-adjusting backup beepers.

- The operation of the front end loader and wood grinding operation shall be limited to the hours of 6AM through 10PM.

- The wood fuel deliveries and lime silo loading shall be limited to the hours of 6AM through 7PM.

- Low-noise generation building ventilation fans and acoustically treated air intake and discharge ventilation louvers.

VII. MEPA Notice of Project Change Certificate Commitments

In response to the MEPA Notice of Project Change (NPC) Certificate dated November 19, 2010, PRE has agreed to provide the following mitigation and monitoring as requested by the NPC Certificate which includes methods to reduce air pollution and minimize health impacts.

For the purposes of improving the efficiency of the plant process and minimizing greenhouse gas emissions, PRE has proposed to further evaluate or implement the following efficiency improvements as identified by The Massachusetts Division of Energy Resources (DOER).

- PRE will install a steam turbine generator that will be a multi-valve, multi-stage design using state of the art steam throttle conditions, high level stage efficiencies and full condensing at minimum pressure to extract the maximum amount of energy from each pound of steam passing through the machine. In addition, the steam turbine will include an extra extraction port to allow for future incorporation of cogeneration steam output.

- PRE will modify the steam cycle design to improve overall plant efficiency by implementing a reheat type cycle which will improve the overall efficiency by approximately 14% (i.e. from a base of 24.4% to 27.8%).

- PRE will design the plant to run primarily at or near full load. Major pumps and fans will operate at a single load except for transition periods such as startup or shutdown. In these cases, variable frequency drives (VFDs) offer no efficiency benefit. However, in applications such as material handling, where variable loads are expected on a routine basis, either multiple components will be installed, operating in a step-wise sequence to match the load, or VFDs will be utilized. Equipment optimizations will be conducted during the detailed design.

- PRE will optimize high pressure steam line routing and line sizing to minimize system pressure drops.

- PRE will evaluate VFDs for air cooled condenser fan motors and variable pitch blades (VPBs) during the detailed design. Maintaining efficient control of airflow through the air cooled condenser is necessary to manage proper operation of the steam cycle.

- PRE will optimize the air cooled condenser sizing and arrangement to minimize pressure drop within the constraints of steam turbine operation.

- PRE evaluated the use of fuel drying as part of the non-major comprehensive plan approval application and found that the costs, increase in PM and VOC emissions, along with other

issues, far outweighed the potential efficiency gains from wood fuel drying. However, PRE will continue to evaluate fuel drying in the detailed design to determine if there is an economically viable method of drying the wood fuel without increasing VOC and PM emissions.

- PRE will evaluate premium grade step-up and distribution transformers for reducing operating losses. This will be evaluated for the economic viability of equipment performance during the detailed design.

- PRE will evaluate controls to minimize energy for operating in all process modes for fuel handling and conveyance system. This will be evaluated for the economic viability of equipment performance during the detailed design.

- PRE will evaluate a state of the art feedwater treatment system to reduce boiler blowdown. This will be evaluated for the economic viability of equipment performance at the time of detailed design.

PRE has also committed to implementing the following greenhouse gas mitigation measures consisting of the following:

- a high-efficiency shell and heating ventilation/air condition (HVAC) system for the office building.
- the use of biodiesel for the yard front-end loader.
- encourage the use of biodiesel by fuel delivery and ash haul trucks.
- the installation of a solar photovoltaic (PV) array with an approximate capacity of 135 kW on the roof of the fuel storage shed to provide onsite power.
- the use of refrigerants with low ozone depletion potential.
- establish a goal of a 50% reduction in construction debris.
- continue to explore the incorporation of cogeneration at the site and conduct a district energy prefeasibility assessment to identify potential users.

Within 12 months of issuance of the air quality plan approval, PRE has committed to providing an engineering report to MassDEP on the efforts to maximize efficiency and mitigate greenhouse gas emissions through design and operation measures including those mentioned above. After the initial report, PRE will submit an engineering report to MassDEP by January 30th of each year. This report shall contain, at a minimum, an update on the efficiency improvements and greenhouse gas mitigation measures listed above as well as a list of any new improvements to process efficiency or greenhouse gas mitigation that are being implemented or evaluated by PRE with a goal of achieving 33% efficiency within 5 years of commencing operation. The report will also contain an update on efforts to incorporate cogeneration and/or district energy.

As mobile sources are not part of the air quality non-major comprehensive plan approval review for stationary sources, PRE has voluntarily agreed to provide diesel retrofits for 25 diesel trucks owned by Palmer Paving or Northern Tree Service, and/or municipal trucks. The retro fits will consist of Catalyzed Diesel Particulate Filters (CDPF), which EPA has indicated would reduce PM by 90% when combined with ultra low sulfur distillate oil. The CDPF will also reduce CO and VOC emissions on the order of 20% to 90%.

PRE will provide $2 million to the City of Springfield as mitigation for the project. Of that amount, $1.33 million will be dedicated specifically to funding local health improvements.

PRE entered into a Host Community Benefit Agreement dated September 23, 2008 with the City of Springfield and the East Springfield Neighborhood Council. This document has been attached to the non-major comprehensive plan approval as Appendix A.

The NPC Certificate also required the use of post-construction air monitoring at the property perimeter. PRE has agreed to establish three separate $PM_{2.5}$ air quality monitors, two NO_2 air quality monitors and a permanent meteorological (met) station. The location of the monitors will be determined during the monitoring protocol review. The met station will be located on top of the fuel building for recording wind speed and direction.

Each monitor will be operated during the initial year of operation to capture $PM_{2.5}$ 24-hour average data and NO_2 1-hour average data during three months in the summer as well as three months during the winter. PRE has committed to providing the monitored $PM_{2.5}$ 24-hour average data, the monitored NO_2 1-hour average data and all reports submitted to MassDEP for public access on a website.

VIII. Provisions of Approval

It is the opinion of MassDEP that the 35 megawatt (MW) (nominal net output) biomass-fired power plant proposed by Palmer Renewable Energy, LLC, consisting of a 509 million Btu per hour water-cooled grate stoker boiler is consistent with modern air pollution control technology and Best Available Control Technology. MassDEP hereby proposes to grant a Conditional Approval for the construction of a biomass-fired power plant as described herein and in the plans submitted with the application pursuant to 310 CMR 7.02(5)(a) of the Air Pollution Control Regulations, subject to the following provisions:

1. The biomass-fired power plant shall be constructed in accordance with the plans submitted with the application (as approved herein).

2. Palmer Renewable Energy, LLC shall submit to MassDEP before startup, in accordance with the provisions of Regulation 310 CMR 7.02(4), **one (1) Limited Plan Application** for written MassDEP approval detailing a quality control/quality assurance (QA/QC) program for the long-term operation of the CEMS and temperature, ammonia injection and dry scrubber reagent injection monitoring systems. Palmer Renewable Energy, LLC, must conform to 40 CFR Part 60, Appendix F, all applicable portions of 40 CFR Parts 72 and 75, and 310 CMR 7.32 (Massachusetts Clean Air Interstate Rule). The QA/QC program must be submitted in writing, reviewed and approved in writing by MassDEP at least 30 days prior to commencement of operation. MassDEP shall approve any subsequent changes to the program.

3. Palmer Renewable Energy, LLC is subject to the following emission restriction and limitation requirements unless otherwise specified below.

Emission Unit	Emission Restrictions and Limitations
Boiler	1. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), the stoker boiler shall have a maximum heat input rate of 509 million Btu per hour and the associated air contaminants shall be controlled by a dry circulating fluid bed scrubber, a fabric collector and a two-canister high efficiency regenerative selective catalytic reduction system. 2. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), the emission of nitrogen oxides, expressed as nitrogen dioxide, from the stoker boiler shall not exceed 0.055 pounds per million Btu of heat input based on a 1-hour block average, 28 pounds per hour based on a 1-hour block average, 0.017 pounds per million Btu of heat input based on any 12 consecutive month average and 37.9 tons in any 12 consecutive month period. 3. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), the emission of carbon monoxide from the stoker boiler shall not exceed 0.114 pounds per million Btu of heat input based on a 1-hour block average, 58 pounds per hour on a 1-hour block average, 0.07 pounds per million Btu of heat input based on a 4-hour block average, 35.6 pounds per hour based on a 4-hour block average, 0.0365 pounds per million Btu of heat input based on any 12 consecutive month average and 81.4 tons in any 12 consecutive month period. 4. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), the emission of sulfur dioxide from the stoker boiler shall not exceed 0.02 pounds per million Btu of heat input based on a 1-hour block average, 10.2 pounds per hour, 0.012 pounds per million Btu of heat input based on any 12 consecutive month average and 26.8 tons in any 12 consecutive month period. 5. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), the emission of total filterable particulate matter, including particulate matter with an aerodynamic diameter of 10 microns or less, also known as PM-10, from the stoker boiler shall not exceed 0.008 pounds per million Btu of heat input, 4.072 pounds per hour and 17.84 tons in any 12 consecutive month period. Compliance with the total filterable particulate matter emission rates shall be based on the average of three stack test runs. 6. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), the emission of total PM-10 (filterable and condensable) from the stoker boiler shall not exceed 0.015 pounds per million Btu of heat input, 7.635 pounds per hour and 33.44 tons in any 12 consecutive month period. Compliance with the total PM-10 emission rates shall be based on the average of three stack test runs. 7. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), the emission of total PM-2.5 (filterable and condensable) from the stoker boiler shall not exceed 0.015 pounds per million Btu of heat input, 7.635 pounds per hour and 33.44 tons in any 12 consecutive month period. Compliance with the total PM-2.5 emission rates shall be based on the average of three stack test runs. 8. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), the visible emissions from the stoker boiler shall not have an opacity in excess of 10 percent at any time (excluding steam). 9. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), the emission of volatile organic compounds from the stoker boiler shall not exceed 0.005 pounds per million Btu of heat input, 2.545 pounds per hour and 11.15 tons in any 12 consecutive month period. Compliance with the short-term VOC emission rates shall be based on the average of three 1-hour stack tests. 10. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), the emission of ammonia from the stoker boiler shall not exceed 13 parts per million by volume dry basis corrected to 3% oxygen based on a 1-hour block average, 0.006 pounds per million Btu of heat input based on a 1-hour block average, 3.05 pounds per hour based on a 1-hour block average and 13.4 tons in any 12 consecutive month period.

Emission Unit	**Emission Restrictions and Limitations - Continued**
Boiler	11. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), the emission of mercury from the stoker boiler shall not exceed 1.2×10^{-6} pounds per million Btu of heat input and 5.36 pounds in any 12 consecutive month period. 12. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), the emission of lead from the stoker boiler shall not exceed 2×10^{-5} pounds per million Btu of heat input and 89.18 pounds in any 12 consecutive month period. 13. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), the emission of hydrogen chloride from the stoker boiler shall not exceed 0.000834 pounds per million Btu of heat input and 1.86 tons in any 12 consecutive month period. 14. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), the emission of any individual hazardous air pollutant, as defined by 310 CMR 7.00, from the stoker boiler shall not exceed 4.15 tons in any 12 consecutive month period. 15. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), the emission of total hazardous air pollutants, as defined by 310 CMR 7.00, from the stoker boiler shall not exceed 13.2 tons in any 12 consecutive month period. 16. Compliance with the HAP emission rates shall be demonstrated during stack tests, as required herein. 17. MassDEP reserves the right to evaluate the actual emission rates and revise the allowable emission rates as contained in this approval upon advanced notice to permittee and opportunity by permittee to comment for total PM-10, total PM-2.5 and hazardous air pollutants for the stoker boiler based upon demonstrated performance during the intial stack test, and/or subsequently promulgated applicable requirements. Any revision of the allowable emission rates shall not exceed levels at which the best available control technology (BACT) were evaluated, shall not exceed the level at which facility impacts were modeled, and shall not be a result of a physical change at the facility. 18. Emission limitations for nitrogen oxides, carbon monoxide, sulfur dioxide, volatile organic compound, total filterable particulate matter, total PM-10, total PM-2.5 and opacity during periods of start-up and shut down will be determined during initial compliance stack tests. MassDEP shall incorporate the emission limits into the Final Approval for the stoker boiler upon issuance and such limits shall be considered enforceable.
Storage Silos (lime, ash)	19. Pursuant to 310 CMR 7.03(12), each dry material storage silo shall be equipped with a fabric filter control capable of maintaining 99.5% control efficiency of particulate matter.
Wood Storage Shed	20. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), there shall be no visible emissions from the wood storage shed stack at any time.

4. Palmer Renewable Energy, LLC is subject to the following testing requirements unless otherwise specified below.

Emission Unit	Testing Requirements
Boiler	**STACK EMISSIONS TESTING** Palmer Renewable Energy, LLC shall: 1. ensure that all stacks are constructed so as to accommodate the emissions testing requirements as stipulated in 40 CFR Part 60, Appendix A. The two outlet sampling ports (90 degrees apart from each other) for each stack must be located at a minimum of one duct diameter upstream and two duct diameters downstream of any flow disturbance. All emissions testing shall be conducted in accordance with the MassDEP's "Air Contaminant Emission Test Guidelines" and in accordance with the Environmental Protection Agency tests as specified in the 40 CFR Part 60, Appendix A, or by a methodology approved by MassDEP. All ammonia testing shall be conducted in accordance with EPA Conditional Test Method 027 or an equivalent test method approved by EPA — Region 1. 2. ensure that all initial stoker boiler emission stack tests are performed within 180 days after initial start-up of the boiler. 3. submit emission test protocol(s) (including testing for startup and shutdown emissions) for review and written MassDEP approval at least 30 days prior to the date of actual testing. The test protocol(s) must describe the test methods and procedures to be used in the performance of testing, shall include dimensioned sketches of the exhaust systems showing the locations of all proposed sampling ports, shall identify all process data which will be monitored and recorded during testing. 4. conduct initial compliance emission stack tests for the stoker boiler at 100% of maximum load and at 'typical' load conditions, to determine compliance with the emission limits (lb/hr, lb/MMBtu, ppmvd, and opacity) established herein for nitrogen oxides, carbon monoxide, sulfur dioxide, volatile organic compounds, ammonia, total filterable particulate matter, total PM-10, total PM-2.5, mercury, hydrogen chloride, lead and opacity. The nitrogen oxides and carbon monoxide stack testing shall be conducted simultaneously. Removal efficiencies shall be determined for metal HAPs. In addition, antimony, arsenic, beryllium, total chromium, chromium (VI), cadmium, cobalt, lead, nickel, manganese, phosphorus and selenium stack tests shall be performed to determine the emission rates (lb/hr and lb/MMBtu) of these metal HAPs. Representative as-fired wood samples shall be taken at the time of the HAP stack tests to accurately determine the HAP content of the wood fired during the testing. Testing shall also be conducted for all organic HAPs. 5. conduct initial compliance stack tests for the duration of start-up and shut down periods for the stoker boiler. Emission data generated from this testing shall be made available for review by MassDEP prior to determining and approving the maximum allowable emissions, including opacity limits, for these periods of time. This testing shall be for nitrogen oxides, carbon monoxide, sulfur dioxide, volatile organic compound, total filterable particulate matter, total PM-10, total PM-2.5 and opacity. 6. repeat the stack tests contained in testing requirement's condition #4 herein at a minimum of every 12 months. The permittee may request a change in frequency of testing and in the type of constituents tested once enough data has been generated to determine the consistency of the results. **BOILER INSPECTION, MAINTENANCE AND TESTING** 7. Pursuant to 310 CMR 7.04(4)(a), have the boiler inspected and maintained in accordance with the manufacturer's recommendations and tested for efficient operation at least once in each calendar year. The results of said inspection, maintenance and testing and the date upon which it was performed shall be recorded and posted conspicuously on or near the proposed equipment. 8. comply with all applicable testing requirements as specified in 40 CFR Part 60 Subpart Db Section 60.45b and Section 60.46b.

Emission Unit	**Testing Requirements – Continued**
Plant-Wide	NOISE TESTING Palmer Renewable Energy, LLC shall: 9. conduct noise testing to determine if Palmer Renewable Energy, LLC can operate the facility in compliance with the L_{90} Combined (facility plus background) Day/Night levels specified in Table 5 "MassDEP Noise Policy Compliance Demonstration for Operational Sound" with the stoker boiler operating at full load, or at another load point agreed to by MassDEP in writing. The noise testing shall: a. be conducted within 180 days after initial start-up of the (entire) facility. b. have a sound monitoring protocol which must be approved by the MassDEP prior to conducting the noise testing. c. be conducted on three separate days for a one-hour period each day during the time of day most likely to result in an exceedance of the sound level. In choosing the time to conduct the testing, both the operation of the facility and the background level should be considered. d. measure the A-weighted sound level and 1/3 octave band sound pressure levels. e. be monitored at the specific locations for which the L_{90} Combined (facility plus background) Day/Night levels have been specified in Table 5 "MassDEP Noise Policy Compliance Demonstration for Operational Sound". f. be rejected for days where, in the opinion of the MassDEP, weather unduly influenced the monitoring results. g. monitor the background sound level, at the option of Palmer Renewable Energy, LLC. The background may be determined by: 1) measuring the sound level with the facility shutdown 2) measuring the sound level near the area that the Department concurs is representative of the background sound in the area. 10. ensure that MassDEP is notified of compliance noise testing no less than 3 days in advance of the testing. 11. work in full cooperation with MassDEP if the noise test results indicate a condition of non-compliance with the L_{90} Combined (facility plus background) Day/Night levels specified in Table 5 "MassDEP Noise Policy Compliance Demonstration for Operational Sound." Changes shall be implemented to bring the facility into compliance within 90 days of measuring the non-compliant noise situation. MassDEP shall be notified in advance of any physical changes at the facility to reduce noise, and of the times any noise measurements will be made to determine the effect of the changes made. 12. ensure that the facility is designed, constructed, operated and maintained such that at all times: a. No condition of air pollution shall be caused by emissions of sound as provided in 310 CMR 7.01; b. No sound emissions resulting in noise shall occur as provided in 310 CMR 7.10 and MassDEP's Policy 90-001 other than approved herein; and c. Sound emissions from the facility shall not exceed the L_{90} Combined Level (facility plus background) Day/Night levels set forth in Table 5 "MassDEP Noise Policy Compliance Demonstration for Operational Sound" at the specified noise sensitive areas. 13. MassDEP reserves the right to require additional measurement periods, locations, or events if in the opinion of MassDEP such additional measurements are necessary to determine compliance with the Air Pollution Control Regulations.

Emission Unit	**Testing Requirements - Continued**
Plant-Wide	**Wood Fuel Testing** Palmer Renewable Energy, LLC shall: 14. conduct initial prequalification testing at each municipal wood facility and private wood yard facility which intends to supply wood to the facility. The testing shall determine the concentration in units of milligram per kilogram (mg/kg) as delivered for arsenic, chromium, lead and mercury. Both the sampling and the analysis shall be conducted by an independent third party. The results of each sample shall be evaluated for compliance with the applicable clean wood fuel specification contained in condition #6 of 8. Special Terms and Conditions herein. 15. repeat the fuel tests contained in the Wood Fuel Testing requirement's condition #14 herein, at a minimum of a quarterly basis, for each municipal wood facility and private wood yard facility which supplies wood to the facility. The results of each quarterly sample shall be evaluated for compliance with the applicable wood fuel specification contained in condition #6 of 8. Special Terms and Conditions herein. The permittee may request a change in frequency of testing and in the type of constituents tested once enough data has been generated to determine the consistency of the results. 16. collect a weekly composite sample from a minimum of five wood fuel delivery trucks, containing wood from municipal wood facilities and private wood yards, for a heavy metals analysis to determine the concentration in units of milligram per kilogram as delivered for arsenic, chromium, lead and mercury. The samples making up the composite sample shall be obtained on different days. The results of each composite truck sample shall be evaluated for compliance with the applicable wood fuel specification contained in condition #6 of 8. Special Terms and Conditions herein. 17. allow representatives of MassDEP to conduct composite/grab samples from conveyors or wood chip stockpiles at PRE and/or municipal wood facilities and private wood yards. In addition, upon request, PRE shall inform MassDEP of upcoming sampling events so that MassDEP may observe sampling by PRE or third parties. The samples shall be submitted to a laboratory at PRE's expense for physical and/or chemical analysis, as specified by MassDEP. 18. perform sampling and analysis of the wood fuel in accordance with the following requirements: a. All analyses shall be performed on representative samples of the material. b. A qualified environmental professional shall perform all sampling. The samples shall be taken and processed in accordance with the procedures stated in the Wood Fuel Quality Assurance Program dated November 8, 2010, except as modified by this permit or otherwise approved by MassDEP in writing. c. Samples shall be sent to a Massachusetts-certified laboratory for analysis using standard chain of custody procedures. d. All analyses shall be performed pursuant to Massachusetts and/or EPA approved test methods.

5. Palmer Renewable Energy, LLC is subject to the following monitoring requirements unless otherwise specified below.

Emission Unit	**Monitoring Requirements**
Boiler	**OPACITY MONITOR** Palmer Renewable Energy, LLC shall: 1. install, calibrate, operate, and maintain a Data Acquisition and Handling System(s) (DAHS) and opacity monitor to continuously monitor and record opacity from the stoker boiler stack. 2. equip the opacity monitor with audible and visible alarms which activate when opacity exceeds the limits established herein. 3. operate the opacity monitor at all times the subject emission unit is operating, except for periods of calibration checks, zero and span adjustments, and preventive maintenance. 4. obtain and record emission data from each opacity monitor for at least 75% of the hours per calendar day, 75% of the days (whole 24-hour days) per calendar month, and 95% of the hours per calendar quarter that the subject emission unit operates, except for periods of calibration checks, zero and span adjustments, and preventive maintenance. 5. maintain on-site for the opacity monitor an adequate supply of spare parts to maintain the on-line availability and data capture requirements contained herein. 6. use and maintain the opacity monitor as a "direct-compliance" monitor to measure compliance with the opacity limit contained herein. A "Direct-compliance" monitor generates data that legally documents the compliance status of a source. MassDEP may also use the opacity monitor or any credible evidence in its determination of compliance with the limits and conditions specified in this approval. 7. ensure that the opacity monitor equipment complies with MassDEP approved performance and location specifications, and conforms with the EPA monitoring specifications in 40 CFR Part 60. **TEMPERATURE MONITORING SYSTEM** Palmer Renewable Energy, LLC shall: 8. install, calibrate, operate, and maintain a temperature monitoring system to continuously monitor the inlet flue gas temperatures to the high efficiency regenerative selective catalytic reduction system, the dry scrubber and the fabric collector. 9. equip each temperature monitoring system with audible and visible alarms which activate when these temperatures deviate from normal operating temperatures. 10. operate all temperature monitoring equipment at all times the stoker boiler is operating, except for periods of calibration checks, zero and span adjustments, and preventive maintenance. 11. obtain and record temperature data from each temperature monitor specified herein for at least 75% of the hours per calendar day, 75% of the days (whole 24-hour days) per calendar month, and 95% of the hours per calendar quarter that "the boiler" operates, except for periods of calibration checks, zero and span adjustments, and preventive maintenance. 12. maintain on-site for the temperature monitoring equipment an adequate supply of spare parts to maintain the on-line availability and data capture requirements contained herein. 13. ensure that all temperature monitors and recording equipment comply with MassDEP approved performance and location specifications.

Emission Unit	**Monitoring Requirements - Continued**
Boiler	Palmer Renewable Energy, LLC shall: 14. equip and maintain instrumentation to continuously monitor the pressure drop across the fabric collector. 15. equip and maintain instrumentation to continuously monitor the reagent flow rate of the dry scrubber. 16. equip and maintain instrumentation to continuously monitor the ammonia injection rate of the high efficiency regenerative selective catalytic reduction system. 17. install, calibrate, operate, and maintain a NOx CEMs at the inlet and outlet of the high efficiency regenerative selective catalytic reduction system to continuously monitor and record flue gas emissions of NOx and NOx removal efficiency. 18. comply with the CEMS monitoring requirements specified in Table A (below). 19. comply with all the applicable monitoring requirements contained in 40 CFR Parts 72 and 75 (Acid Rain Program) and 310 CMR 7.32 (Massachusetts Clean Air Interstate Rule) 20. comply with all applicable monitoring requirements as specified in 40 CFR Part 60 Subpart Db Section 60.48b.
Plant-Wide	Palmer Renewable Energy, LLC shall: 21. conduct regular, documented, unannounced visits to all municipal and private wood yards on a minimum of a quarterly basis for the purposes of inspecting the clean wood fuel supplies for compliance with the applicable clean wood fuel conditions in Section 8. Special Terms and Conditions herein. An initial compliance inspection of each municipal or private wood yard shall be conducted by Palmer Renewable Energy, LLC prior to accepting any shipments of clean wood from the respective source. 22. visually inspect all wood fuel deliveries for any amount of obvious non-wood materials that would exceed the wood fuel specification. If the load fails the visual inspection, the load shall be rejected and sent back to the supplier. 23. in accordance with 310 CMR 7.01 and the Notice of Project Change Certificate dated November 19, 2010, construct, operate and maintain three separate $PM_{2.5}$ ambient air monitoring devices, two separate NO_2 ambient air monitoring devices and a meteorological station. The exact locations of the $PM_{2.5}$ and NO_2 monitors shall be determined during review of the monitoring protocol. Each $PM_{2.5}$ and NO_2 monitor shall be operated and maintained during the stoker boiler's initial year of operation using applicable EPA methods for ambient air monitoring to measure and calculate $PM_{2.5}$ 24-hour average data and NO_2 1-hour average data during three months in the summer as well as three months in the winter. The monitored months shall be specified in the monitoring protocol. 24. establish a website for public access and post on the website the three month monitoring reports of perimeter $PM_{2.5}$ 24-hour average data and NO_2 1-hour average data, all stack test reports, semi-annual compliance reports and annual engineering reports within 7 days of the dated submittal to MassDEP.

Table A - CEMS Monitoring Requirements

Required for Boiler	Palmer Renewable Energy, LLC shall:
	25. install, calibrate, operate, and maintain a data acquisition and handling system(s) (DAHS) and stack CEMs to continuously monitor and record flue gas emissions of NO_x, CO, SO_2, filterable PM, NH_3, and a diluent gas (oxygen or carbon dioxide) from the stoker boiler stack.
	26. equip each CEMs with audible and visible alarms which activate when emissions exceed the limits established herein.
	27. operate all CEMs at all times the stoker boiler is operating, except for periods of CEMs calibration checks, zero and span adjustments, and preventive maintenance.
	28. obtain and record emission data from each CEMS at all times while the emission unit is operating except for periods of calibration checks, zero and span adjustments, and preventive maintenance. PRE should notify the MassDEP in writing when they intend to perform periods of calibration checks, zero and span adjustments, and preventative maintenance. For periods when the CEMS malfunctions, PRE should follow the reporting steps specified in condition #6 of the Reporting Requirements section herein.
	29. maintain on-site for the CEMs equipment an adequate supply of spare parts to maintain the on-line availability and data capture requirements contained herein.
	30. use and maintain all its CEMs systems as "direct-compliance" monitors to measure compliance with the emission limits contained herein. "Direct-compliance" monitors generate data that legally documents the compliance status of a source. MassDEP may also use the CEMs or any credible evidence in its determination of compliance with the limits and conditions specified in this approval.
	31. ensure that the CEMS equipment complies with MassDEP approved performance and location specifications, and conforms with the EPA monitoring specifications specified in 40 CFR Part 60 and all applicable portions of 40 CFR Parts 72 and 75.
	32. Ensure that the NH_3 CEMS complies with the CEMS linearity check and Relative Accuracy Test Audit (RATA) frequencies and grace periods specified in 40 CFR Part 75 in conducting linearity checks and RATA's. The relative accuracy (mean difference between the reference method values and the corresponding CEMS values) of the NH_3 CEMS shall be within the greater of +/- 15% of the approved NH_3 emission limits or +/- 0.75 ppmvd or +/- 0.001 lb/MMBtu or lb/hr = +/- 0.001 lb/MMBtu x WA_MMBtu/hr, where WA_MMBtu/hr = the weighted average MMBtu/hr determined by the DAHS over the hours during which the RATA was performed.
	33. In the event a given NH_3 CEMS RATA does not meet the relative accuracy specified in condition #31, proceed as follows: a. PRE shall investigate the possible reasons for a RATA failure and whether repairs or adjustments are necessary for the NH_3 CEMS or its sampling location/path. If such NH_3 CEMS repairs or adjustments are necessary prior to a successful RATA, or if sampling location/path adjustments are required, then the NH_3 CEMS data shall be considered invalid from the time of the failed RATA until a successful RATA occurs. b. If no repairs or adjustments to the NH_3 CEMS are necessary between the time of a failed RATA and a successful RATA, and no sampling location/path adjustments are needed, then the NH3 CEMS data shall be considered valid during the period between the failed RATA and successful RATA.
	34. Ensure that In the event data from the NH_3 CEMS is not available, corrective action is implemented as quickly as practical to bring the NH_3 CEMS back to service. During the time when the NH_3 CEMS is not available, PRE may submit a parametric monitoring methodology to MassDEP for approval to provide assurance that the NOx levels, operating loads, and NH_3 injection rates being maintained are consistent with prior NH_3 compliant operation.

6. Palmer Renewable Energy, LLC is subject to the following recordkeeping requirements unless otherwise specified below.

Emission Unit	**Recordkeeping Requirements**
Boiler	Palmer Renewable Energy, LLC shall: 1. maintain a log to record problems, emergencies, malfunctions, upsets or failures associated with the emission control systems, CEMS, temperature monitors, or ammonia handling system. 2. record all periods of excess emissions, even if attributable to an emergency/malfunction or startup/shutdown, and shall quantify these emissions and include them in the determination of annual emissions. 3. record all measurements, performance evaluations, calibration checks, maintenance, and adjustments for each CEMS, ammonia injection system, fabric collector pressure drop monitoring system, dry scrubber reagent flow monitoring system and temperature monitoring system devices. 4. keep on-site permanent records of output from each CEMS, fabric collector pressure drop monitoring system, ammonia injection system, dry scrubber reagent flow monitoring system and temperature monitoring systems. 5. record on a daily basis the type(s) of fuel burned, heat content of each fuel, total heating value of the fuel consumed, and the actual emission rate for each pollutant demonstrating compliance with CEMS. 6. record the quantity (tons) of clean wood contained in each delivery of wood fuel received at the plant as well as the corresponding identity of the supplier for each wood fuel delivery. 7. record the quantity (tons) of clean wood fuel burned in the stoker boiler each month and in each 12 consecutive month period. 8. record the total amount of natural gas burned in the stoker boiler and in the HRSCR burner each month and the amount burned in each 12 consecutive month period. 9. keep a record of each signed contract for each supplier of clean wood fuel. 10. record the inspections and clean wood fuel test results for each municipal wood facility and private wood yard facility which supplies clean wood. These records shall include, at a minimum: a. the name and location of the municipal wood facility or private wood yard facility b. the date and time that the inspection was performed c. the date and time that the fuel sample was obtained d. the identity of the person performing the inspection and obtaining the fuel sample e. the location of where the sample was obtained f. detailed description of the clean wood fuel storage area g. the estimated ton per year of wood fuel the supplier generates h. the estimated tons to be supplied to PRE i. the test results for each sample including the analytical methods, with the expected minimum detection levels, which were used for the measurement of the contaminants j. a description of any noncompliance issues and any corrective actions taken for the purposes of verifying compliance with the applicable wood fuel specification contained in Section 8. Special Terms and Conditions herein.

Emission Unit	**Recordkeeping Requirements-Continued**
Boiler	Palmer Renewable Energy, LLC shall: 11. record the results of each heavy metals analysis of the clean wood fuel composite sample taken from the wood fuel delivery trucks. The records shall include, at a minimum: a. the date and time that each sample of the composite was obtained b. the identity of the person obtaining the fuel sample c. the location of where each sample was obtained d. the name of the wood supplier from which each sample of the composite was obtained e. the test results for each composite sample including the analytical methods, with the expected minimum detection levels, which were used for the measurement of the contaminants f. a description of any noncompliance issues and any corrective actions taken for the purposes of verifying compliance with the applicable wood fuel specification contained in condition #6 in Section 8. Special Terms and Conditions herein. 12. record for each wood fuel delivery which fails the visual inspection for obvious non-wood the following information: a. the date and time of the visual inspection b. the identity of the person performing the inspection c. the name of the wood fuel supplier which failed the visual inspection d. reason for the failed load and description of contaminants found in the wood fuel delivery e. corrective actions taken with the wood fuel supplier which failed the visual inspection. 13. record the inlet flue gas temperature to the two canister high efficiency regenerative selective catalytic reduction system (on a continuous basis). 14. record the ammonia injection rate of the multi-pollutant catalytic reduction system (on a continuous basis). 15. record the differential pressure across the fabric collector and the fabric collector inlet temperature (on a continuous basis). 16. record the dry scrubber reagent flow rate (on a continuous basis). 17. record the dry scrubber temperature (on a continuous basis). 18. record the calculated lead, mercury and hydrogen chloride emission rates, all associated calculations and all supporting data used to verify compliance with emission limitations contained herein. 19. record the calculated highest individual HAP and total HAP emission rates, all associated calculations and all supporting data used to verify compliance with emission limitations contained herein. 20. record the sulfur content in natural gas used by the stoker boiler on a daily basis in accordance with 40 CFR Part 75. 21. comply with all applicable record keeping requirements regarding the stoker boiler contained in 40 CFR Parts 72 and 75, and 310 CMR 7.32. 22. comply with all applicable recordkeeping requirements as specified in 40 CFR Part 60 Subpart Db Section 60.49b.

Emission Unit	**Recordkeeping Requirements-Continued**
Storage Silos (lime, ash)	Palmer Renewable Energy, LLC shall: 23. maintain comprehensive accurate records for the number of hours that the ash storage silo is operated for loading and unloading during each month and in each 12 consecutive month period. 24. maintain comprehensive accurate records for the number of hours that the lime storage silo is operated for loading and unloading during each month and in each 12 consecutive month period.
Plant-Wide	Palmer Renewable Energy, LLC shall: 25. maintain comprehensive accurate records for the entire facility which shall be adequate to allow compliance to be determined with the requirements contained in all conditions contained herein. At a minimum, these records shall include those specified in the Recordkeeping Requirements section herein. 26. record all operating and monitoring records and logs for the life of the facility. Palmer Renewable Energy, LLC shall make available to MassDEP for inspection upon request the five most recent years' data.

7. Palmer Renewable Energy, LLC is subject to the following reporting requirements unless otherwise specified below.

Emis-sion Unit	**Reporting Requirements**
Boiler	1. Palmer Renewable Energy, LLC shall notify MassDEP, in writing, the date for initial startup of the boiler at least five (5) days prior to initial startup. 2. Within 12 months of the commencement of operation of the stoker boiler, Palmer Renewable Energy, LLC, shall submit a report to MassDEP with a proposal for an optimized carbon monoxide 1-hour block average, 4-hour block average and ton per year emission rate which shall be based on actual carbon monoxide emission data from the boiler stack test and continuous emission monitoring system. The proposal for the final optimized carbon monoxide emission rates shall contain supporting emission data and written justification. The final optimized carbon monoxide emission rates shall be no less stringent than the emission rates as specified in condition #3 of the Emission Limits and Restrictions section herein. 3. Palmer Renewable Energy, LLC shall submit the final emission stack test report(s)/ noise test report(s) to MassDEP within 60 days after the completion of each of the tests. This test report shall contain the results of the testing, a description of the test methods and procedures actually used in the performance of the tests, copies of all process data collected during the testing, copies of all raw test data and copies of all calculations generated during data analysis. The results of the testing shall be expressed in units which allow for a direct comparison, and determination of compliance, with the air contaminant emission limitations contained herein. 4. Palmer Renewable Energy, LLC shall ensure that the boiler complies with all applicable reporting requirements contained in 40 CFR Parts 72 and 75, and 310 CMR 7.32. 5. Palmer Renewable Energy, LLC shall comply with all applicable reporting requirements as specified in 40 CFR Part 60 Subpart Db Section 60.49b.
Plant-Wide	6. Palmer Renewable Energy, LLC shall submit to MassDEP after commencing operation, in a format acceptable to MassDEP, a semi-annual report postmarked by no later than January 30th of each year (containing the records generated for the immediately preceding July through December six month period) and July 30th of each year (containing the records generated for the immediately-preceding January through June six month period), which minimally contains for the prior calendar 6 consecutive month period the following information: a. reports from the facility CEMS (NOx, SO_2, CO, Ammonia, PM and Opacity), temperature monitors, ammonia injection rate monitor and dry scrubber reagent flow rate monitor containing summary data, and; b. for each period of excess emissions or excursions from allowable operating conditions, Palmer Renewable Energy, LLC shall list the duration, cause (including whether it is attributable to a malfunction or emergency), the response taken, and the amount of excess emissions. Periods of excess emissions shall include malfunctions, emergency, and upsets or failures associated with the emission control system, CEMS or temperature monitors. **"Malfunction"** means any sudden and unavoidable failure of air pollution control equipment or process equipment or of a process to operate in a normal or usual manner. Failures that are caused entirely or in part by poor maintenance, careless operation, or any other preventable upset condition or preventable equipment breakdown shall not be considered malfunctions. **"Emergency"** means any situation arising from sudden and reasonably unforeseeable events beyond the control of this source, including acts of God, which situation would require immediate corrective action to restore normal operation, and that causes the source to exceed a technology based limitation under the Approval, due to unavoidable increases in emissions attributable to the emergency. An emergency shall not include noncompliance to the extent caused by improperly designed equipment, lack of preventative maintenance, careless or improper operations, operator error and decision to keep operating despite knowledge of these things. **"Upset"** means any situation arising that varies from normal operating conditions and is not a malfunction or emergency.

Emission Unit	Reporting Requirements - Continued
Plant-Wide	c. the quantity of wood fuel used in the boiler each month and in each 12 consecutive month period. d. the total amount of natural gas fuel used in the boiler and in the HRSCR duct burner each month and in each 12 consecutive month period. e. the calculated lead, mercury and hydrogen chloride emission rates from the boiler during each month and in each 12 consecutive month period. Associated calculations and all supporting data may be required upon request by MassDEP. f. the calculated highest individual HAP and total HAP emission rate from the boiler during each month and in each 12 consecutive month period. Associated calculations and all supporting data may be required upon request by MassDEP. g. a list of all municipal or private wood yards for which inspections were performed, the corresponding date that each the wood yard was inspected and any inspection reports for which a municipal or private wood yard was found to be in noncompliance with the applicable clean wood fuel conditions contained in Section 8. Special Terms and Conditions herein. The report shall contain an explanation of the noncompliance issue and the corrective actions taken. 7. Within 12 months of the issuance date of the air quality plan approval, Palmer Renewable Energy, LLC shall provide an engineering report to MassDEP on the efforts to maximize efficiency and mitigate greenhouse gas emissions through design and operation measures with a goal of achieving a minimum efficiency of 33% within 5 years of commencing operation. After the initial annual report, Palmer Renewable Energy, LLC shall annually submit the engineering report to MassDEP, in a format acceptable to MassDEP, and postmarked by no later than January 30th of each year. The engineering report shall contain, at a minimum, an update on the efficiency improvements and greenhouse gas mitigation measures, as well as a list of any new improvements to process efficiency or greenhouse gas mitigation that are being implemented or a being evaluated. The report shall also contain an update on efforts to incorporate cogeneration and/or district energy. Palmer Renewable Energy, LLC, may request in writing that MassDEP waive the requirement to perform the engineering reports if it can be demonstrated that a significant increase in efficiency and greenhouse gas mitigation has been achieved in practice at the facility. **EMERGENCY / MALFUNCTION** 8. Palmer Renewable Energy, LLC shall notify MassDEP immediately by telephone and in writing within three (3) business days of any upset, emergency or malfunction, when the upset, emergency or malfunction may cause emissions to the ambient air that exceed any emission limits including noise limits contained herein; or cause a condition of air pollution, or otherwise violate a term or condition of this approval. The written notice must contain a description of the upset, emergency or malfunction, the nature and cause of the upset, emergency or malfunction, time when the upset, emergency or malfunction was first observed, any steps taken to mitigate emissions, an estimate of the quantity of emissions released as a result of the upset, emergency or malfunction, duration of excess emissions and any corrective actions taken. 9. Palmer Renewable Energy, LLC shall notify MassDEP immediately by telephone and in writing within three (3) business days, following the release or the threat of a release of ammonia, and/or upsets, emergencies or malfunctions to the ammonia handling or delivery systems, and comply with all notification procedures required under M.G.L. c. 21 E - Spill Notification Regulations, and the Massachusetts Contingency Plan, 310 CMR 40.000. 10. If the initial notice was not provided within three (3) business days, then Palmer Renewable Energy, LLC shall have the burden of establishing that the initial notice was provided as soon as reasonably practical in any subsequent enforcement action. 11. The reporting requirements of this Conditional Approval for an emergency or malfunction do not supersede, limit, or make inapplicable any reporting obligation under federal law, including but not limited to 42 U.S.C. sections 9603 or 11004.

Emission Unit	Reporting Requirements - Continued
Plant-Wide	12. An emergency and/or malfunction may constitute an affirmative defense to an action brought for noncompliance with emission limitations if Palmer Renewable Energy, LLC demonstrates the affirmative defense of emergency or malfunction through properly signed, contemporaneous operating logs and other relevant evidence shows that: a. an emergency or malfunction occurred and that the cause(s) of the emergency or malfunction can be identified; b. Palmer Renewable Energy, LLC , was, at that time, operating the facility in a correct manner; c. during the period of the emergency or malfunction, Palmer Renewable Energy, LLC took all reasonable steps as expeditiously as possible to minimize levels of emissions that exceeded the emission standards, or other requirements in this approval; and d. Palmer Renewable Energy, LLC submitted notice of the emergency or malfunction to MassDEP in writing within three (3) business days of the emergency or malfunction. The written notice must contain a description of the emergency or malfunction, any steps taken to mitigate emissions, an estimate of the quantity of emissions released as a result of the emergency or malfunction and any corrective actions taken. **SOURCE REGISTRATION** 13. Pursuant to 310 CMR 7.12 (1)(a) and (2)(a), the facility shall submit a source registration to MassDEP by April 15th of each year. The first source registration will be due on the April 15th following the year that the facility commenced operation. 14. The source registration required by reporting requirement condition #13 herein shall include the contents as specified in 310 CMR 7.12 (3)(a). **AMBIENT AIR MONITORING** 15. At least 90 days prior to the commencement of operation of the stoker boiler, Palmer Renewable Energy, LLC, shall submit to MassDEP a $PM_{2.5}$ and NO_2 ambient air monitoring protocol for written approval by MassDEP. The monitoring protocol shall include a detailed plan for installing, operating and maintaining the $PM_{2.5}$ and NO_2 monitors using applicable EPA methods such as 40 CFR Part 50, Appendix F and Appendix L. The protocol shall also specify the exact locations for each $PM_{2.5}$ and NO_2 ambient air monitor with supporting justification, the proposed monitor operating schedules (i.e. continuous, non-continuous filter-based, etc.), as well as the specific months in which the monitoring will be conducted. 16. Within 60 days after the end of each three month monitoring period, Palmer Renewable Energy, LLC shall submit a report to MassDEP which shall contain the results of the 24-hour average $PM_{2.5}$ and 1-hour average NO_2 ambient air monitoring data.

8. Special Terms and Conditions

Biomass-Fired Boiler
Operational Requirements / Restrictions

1. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), the stoker boiler shall not be operated without the simultaneous operation of the respective air pollution control equipment as specified in condition #1 of the Emission Limits and Restrictions section herein.

2. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), only clean wood, as defined in condition #3 of 8. Special Terms and Conditions herein, shall be fired in the stoker boiler except that natural gas, or equivalent as determined by MassDEP, may be fired in the boiler's startup burner during cold and hot startups, for flame stabilization and for reheat and temperature control of the HRSCR system. Additionally, the permittee shall not burn residual, municipal, hazardous, hospital, infectious, chemotherapeutic wastes or any other material not specifically identified in this plan approval.

3. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), clean wood fuel shall include trees, cord wood, logs, lumber, saw dust, wood pellets, slabs, bark, chips, waste pallets, boxes, etc. The clean wood fuel fired in the stoker boiler shall not contain any construction and demolition waste or any wood that may contain paints, surface treatments, plastic laminants, preservatives including but not limited to creosote, pentachlorophenol (penta), chromated copper arsenate (CCA) or hazardous materials which shall include asbestos, polychlorinated biphenyls (PCBs), petroleum products and any pollutant contaminants, chemical or industrial, toxic, or hazardous substances or wastes, as these terms are defined by federal, state, or local laws, rules, regulations, ordinances, codes, policies or rules of common law now or hereinafter in effect, and any judicial or administrative interpretation. Noncombustibles including rocks, metal, ice, etc. are unacceptable.

   Clean wood fuel shall be supplied only from non-forest derived wood materials which comes from only the following sources: primary forest products industry, secondary forest products industry, land use change – non-agricultural, land use change – agricultural, yard waste and wood waste as specified and defined in the Wood Fuel Quality Assurance Program dated November 8, 2010. The non-forest derived wood materials which are collected at a municipal wood facility or a private wood yard facility shall be defined as municipal wood fuel.

4. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), no more than 432,160 tons of wood fuel consisting of clean wood, as defined in condition #3 of Section 8. Special Terms and Conditions herein, shall be fired in the stoker boiler during any 12 consecutive month period.

5. Sources of municipal wood fuel shall consist of clean wood, as defined in condition #3 of Section 8. Special Terms and Condition herein, collected from either a municipal wood facility or a private wood yard facility.

a. Allowable municipal wood fuel facilities shall receive only clean wood and shall not be co-located with a solid waste transfer facility.

b. Wood from a private wood yard facility that accepts any type of treated wood is prohibited for use as fuel.

c. No municipal wood facilities (other than those described in a. above) are qualified as a wood fuel source unless first approved in writing by MassDEP.

6. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), allowable sources of municipal wood fuel which meet the requirements of conditions #3 and #5 of Section 8. Special Terms and Conditions herein shall comply with Palmer Renewable Energy, LLC s wood fuel specification of:

Wood Fuel Design Specification

Contaminant	Test Method[1]	Maximum Allowable Level (As Delivered)	Maximum Annual Average[2] (As Delivered)
Arsenic	EPA SW-846-6010B	1.9 mg/kg	-
Chromium	EPA SW-846-6010B	30.4 mg/kg	8.3 mg/kg
Lead	EPA SW-846-6010B	31.6 mg/kg	6.7 mg/kg
Mercury	EPA SW-846-7471A	0.1 mg/kg	-

[1] Test methods to be updated as-needed to reflect updates in standard methods.
[2]The annual average shall be based on the average of all composite samples collected in any 12 consecutive month period.

7. Prior to Palmer Renewable Energy, LLC receiving clean wood fuel, Palmer Renewable Energy, LLC, shall have a signed contract with all suppliers of clean wood fuel, as defined in condition #3 of Section 8. Special Terms and Conditions herein, which prohibits any type of treated wood in the fuel supply to Palmer Renewable Energy, LLC. Contracts for sources of municipal wood fuel shall specify that representatives of MassDEP shall be allowed to conduct composite/grab samples of the wood, if requested.

8. At least 30 days prior to the initial receipt of clean wood from a qualified municipal wood fuel supplier as specified in condition #5 and #6 of Section 8. Special Terms and Conditions herein, a copy of the supplier's signed contract, as specified in condition #7 of 8. Special Terms and Conditions herein, shall be provided to MassDEP which shall include the wood sampling test results for each municipal wood facility and private wood yard facility.

9. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), the stoker boiler and the HRSCR duct burner shall use no more than a combined total of 18.2 million standard cubic feet of natural gas, or equivalent as determined by MassDEP, in any 12 consecutive month period.

10. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), only natural gas fuel, or equivalent as determined by MassDEP, shall be burned in the boiler startup burner and in the duct burner of the two canister HRSCR. The startup burner and duct burner shall have a maximum heat input rate of 127 million Btu per hour of heat input and 1.5 million Btu per hour of heat input, respectively.

11. The exhaust stack of the stoker boiler shall exhaust vertically to the atmosphere at a height of no less than 275 feet above grade. Additionally, the inside diameter of the flue shall be no greater than 6.167 feet at the point of exhaust.

12. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), the fabric collector controlling the stoker boiler shall have an effective air-to-cloth ratio under actual conditions of no more than 3.48:1 and the collector bags shall be cleaned using a pulse jet system.

13. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), a sufficient quantity of spare fabric bags for the fabric collector of the stoker boiler shall be kept on hand at all times in order to immediately replace any worn or damaged bags due to deterioration resulting from routine operation of the fabric collector.

14. The stoker boiler is subject to Subpart Db of the federal New Source Performance Standards, 40 CFR Part 60.40b-60.49b. Palmer Renewable Energy, LLC shall comply with all applicable requirements of the Subpart as well as any other applicable Subpart of the Standards of Performance.

Wood Handling/Processing Requirements

15. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), all conveyors and transfer points transporting wood shall be fully enclosed, except for where wood enters and exits the conveyor, unless a portion of the conveyor is completely inside a fully enclosed building. Additionally, the wood grinding/screening operations shall be located inside a building which shall be fully enclosed and all of the building's potential openings shall be closed during the processing of wood.

16. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), the air contaminant emissions from the wood fuel conveying/transfer system shall be controlled by a water spray dust suppression system, as needed, which shall, at a minimum, incorporate a spray nozzle at the head of the last stock-out conveyor (stock-out conveyor #4). More spray nozzles may be added without the necessity of obtaining MassDEP plan approval but none of those identified herein may be deleted or removed without prior MassDEP approval.

17. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), the water spray dust suppression system shall be connected to an on-demand water source capable of delivering an adequate supply of water at any time the plant is in operation. On-demand shall be interpreted as meaning that adequate water can be provided to all spray nozzles at any time with no more effort than turning a valve. If at any time the water spray dust suppression system is unable to provide an adequate supply of water due to freezing weather or any other reason Palmer Renewable Energy, LLC shall immediately cease operation of the wood fuel conveying/transfer system or put in place an equivalent replacement water spray dust suppression system.

18. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), the water spray dust suppression system shall be equipped with strainers to prevent clogging of the associated water spray nozzle(s).

19. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), all stockpiles of wood fuel shall be contained inside a covered three-sided storage building.

170 Ton Ash Storage Silo

20. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), the fly ash from the 170 ton ash storage silo shall be sufficiently conditioned with water in a pug mill prior to loading of the fly ash into trucks so that fugitive emissions are prevented from occurring.

21. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), an enclosed discharge chute shall be used during all fly ash loadouts into trucks in order to minimize the drop height.

22. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), the ash storage silo shall not be operated for the purposes of loading and unloading for more than 4000 hours in any 12 consecutive month period.

23. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), the ash storage silo pug mill and associated water supply lines shall be heated with an electrical or steam heat tracing system.

30 Ton Lime Storage Silo

24. Pursaunt to the best available control technology provision of 310 CMR 7.02(8)(a), the lime storage silo shall not be operated for the purposes of loading and unloading for more than 300 hours in any 12 consecutive month period.

Noise Mitigation Controls

25. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), an industrial grade building shall enclose the boiler, turbine unit, wood grinding and auxiliary support equipment.

26. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), a stack silencer shall be installed on the stoker boiler's exhaust stack.

27. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), all on-site mobile equipment shall be equipped with exhaust mufflers and shall have low-noise, ambient-adjusting backup beepers.

28. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), wood fuel deliveries and lime silo loading shall be limited to the hours of 6AM through 7PM and the operation of the front end loader and wood grinding operation shall be limited to the hours of 6AM through 10PM.

Plant-Wide Additional Requirements

29. Within 30 days of selection of the specific boiler, dry scrubber, high efficiency regenerative selective catalytic reduction system, fabric filter collector, that Palmer Renewable Energy, LLC proposes to install, Palmer Renewable Energy, LLC shall notify MassDEP of the manufacturer and model of the respective piece of equipment selected and shall additionally, at the same time, submit to MassDEP for review specifications for the respective piece of equipment that are comprehensive enough to allow MassDEP to determine if the selected piece of equipment is equivalent to that proposed in the comprehensive plan approval application.

30. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), all active plant roadways shall be paved and maintained.

31. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), all trucks loaded with bottom ash or fly ash entering or exiting the facility via public roadways shall have their truck beds completely tarped or have their loads sufficiently wetted prior to exiting the facility so as to prevent the emission of fugitive particulate matter.

32. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), all trucks loaded with clean wood entering or exiting the facility via public roadways shall have enclosed trailers or have their truck beds completely tarped so as to prevent the emission of fugitive particulate matter.

33. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), all bottom ash and fly ash processing and handling systems shall be enclosed.

34. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), an operable vacuum type road sweeper shall be used, as needed, for the prevention and control of fugitive particulate matter emissions from plant roadways. The use of non-vacuum type road sweepers is prohibited.

35. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a), the facility shall establish and enforce vehicle speed limits of no higher than 10 miles per hour and this speed limit shall be posted in highly visible locations along the respective roadways.

36. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a)2, Palmer Renewable Energy, LLC shall employ all reasonable good housekeeping practices to minimize fugitive particulate matter emissions from the loading and unloading of material, material processing and the use of internal roadways at the facility.

37. If, at any time, the biomass-fired plant, or any piece of equipment incorporated in the plant, is determined by MassDEP to be causing the emission of fugitive particulate matter in excess of the limitations specified in any applicable rule or regulation contained in 310 CMR 7.00 or in excess of the level which MassDEP considers to be the minimum attainable through the use of best available control technology, Palmer Renewable Energy, LLC shall, upon notification by MassDEP, immediately take such control measures as are necessary to reduce the air contaminant emissions to within the level deemed acceptable by MassDEP.

38. Palmer Renewable Energy, LLC shall install a fence and gates to enclose all areas within the ambient air boundary as shown in the plan approval application modeling analysis. The fence shall be at a height of no less than four feet and constructed such that an adult person cannot easily step through. The fence shall have signs spaced at intervals no greater than 100 yards, with the message "No Trespassing". Lockable gates shall be installed at any place where access through the fence is needed.

39. Palmer Renewable Energy, LLC shall ensure that the diked area around the double walled ammonia storage tank is equipped with passive evaporative control (such as polyethylene balls) that, in the event of a spill, is capable of achieving at all times a minimum surface area reduction

of 90% and is maintained free of ice/snow/leaves or anything else that could reduce its surface area reduction properties.

40. By October 31 of each year, Palmer Renewable Energy, LLC shall calculate the total combined mass-based NOx emission rate in units of tons for the immediately preceding ozone season which is from May 1 through September 30 of each year. Palmer Renewable Energy, LLC shall then purchase mass-based NOx emission reduction credits for the amount of NOx emissions which were calculated for the preceding ozone season rounded up to the next whole ton. The purchased mass-based NOx emission reduction credits shall be transferred to MassDEP in order to be retired by no later than December 31 of each year. Palmer Renewable Energy, LLC shall keep records of the ozone season NOx emission rate for each year as well as documentation for the amount of ozone season NOx emission reduction credits which were purchased and retired for the benefit of the environment.

41. Palmer Renewable Energy, LLC shall comply with the visible emission limitations pursuant to 310 CMR 7.06, the dust, odor, construction and demolition limitations pursuant to 310 CMR 7.09 and the noise limitations pursuant to 310 CMR 7.10.

42. Palmer Renewable Energy, LLC shall properly train all personnel to operate the facility monitoring and control equipment in accordance with vendor specifications and all applicable regulations. This training shall be updated at least once annually. MassDEP personnel shall be informed of scheduled training sessions at least 30 days in advance and MassDEP personnel shall be allowed access to attend these training sessions.

43. Within one year of commencement of operation, Palmer Renewable Energy, LLC shall file an Operating Permit Application for the Project with the MassDEP, pursuant to Regulation 310 CMR 7.00: Appendix C.

44. Palmer Renewable Energy, LLC shall ensure that the Project complies with all applicable operational standards contained in 40 CFR Parts 72 and 75, 40 CFR 60, 310 CMR 7.32 and 310 CMR 7.71.

General Requirements

45. MassDEP may revoke any plan approval if construction has been suspended or has not commenced within the timeframes specified in 310 CMR 7.02 (3)(k).

46. Suspension: This Conditional Approval may be suspended, modified, or revoked by MassDEP if, at any time, MassDEP determines that Palmer Renewable Energy, LLC is violating any condition or part of the approval.

47. Other Regulations: This Conditional Approval does not negate the responsibility of Palmer Renewable Energy, LLC to comply with this or any other applicable federal, state, or local regulations now or in the future. This Conditional Approval does not supersede or imply compliance with any other applicable federal, state or local regulation now or in the future.

48. Compliance Determination: Continuous compliance with the emission limits contained herein shall be determined by data collected by CEMS, the temperature monitoring system and other parametric monitoring systems as specified within this Conditional Approval and/or by stack

emission test methods as approved by MassDEP. MassDEP may also use any credible evidence in its determination of compliance with the limits and conditions specified in these approvals.

49. The facility shall allow MassDEP personnel access to the site, buildings, and all pertinent records at all reasonable times for the purpose of making inspections and surveys, collecting samples, obtaining data, and reviewing records.

50. This Conditional Approval consists of the application materials and this Approval letter. If conflicting information is found between these two documents, then the requirements of the Approval letter shall take precedence over the documentation in the application materials.

This approval is an action of MassDEP. If you are aggrieved by this action, you may request an adjudicatory hearing. A request for a hearing must be made in writing and postmarked within twenty-one (21) days of the date of issuance of this approval.

Under 310 CMR 1.01(6)(b), the request must state clearly and concisely the facts which are the grounds for the request, and the relief sought. The hearing request along with a valid check payable to the Commonwealth of Massachusetts in the amount of one hundred dollars ($100.00) must be mailed to:

Commonwealth of Massachusetts
Department of Environmental Protection
P.O. Box 4062
Boston, Massachusetts 02211

The request will be dismissed if the filing fee is not paid unless the appellant is exempt or granted a waiver as described below.

The filing fee is not required if the appellant is a city or town (or municipal agency), county, or district of the Commonwealth of Massachusetts, or a municipal housing authority.

MassDEP may waive the adjudicatory hearing filing fee for a person who shows that paying the fee will create an undue financial hardship. A person seeking a waiver must file, together with the hearing request as provided above, an affidavit setting forth the facts believed to support the claim of undue financial hardship.

If you have any questions regarding this Conditional Approval, please do not hesitate to contact Cortney Danneker at 413-755-2234 or Marc Simpson at 413-755-2115.

Sincerely,

This final document copy is being provided to you electronically by the Department of Environmental Protection. A signed copy of this document is on file at the DEP office listed on the letterhead.

Michael Gorski
Regional Director
Department of Environmental Protection
Western Regional Office

ecc: Dale Raczynski, PE, Epsilon Associates, Inc.

ecc: David Howland - WERO
Peter Czapienski - WERO
Yi Tian - DEP Boston
Marc Wolman – DEP Boston
Tom Cusson – CERO
James Belsky - NERO
John Winkler - SERO
Ida McDonnell -EPA Region 1

Appendix A - Host Community Benefit Agreement

PALMER RENEWABLE ENERGY, LLC
1000 PAGE BOULEVARD
SPRINGFIELD, MA 01103

September 23, 2008

Mr. David Panagore
City of Springfield
70 Tapley Street
Springfield, MA 01103

Ms. Kathleen Brown
East Springfield Neighborhood Council
136 Edendale Street
Springfield, MA 01104

Re: Palmer Renewable Energy, LLC

Dear David and Kathleen:

This letter will set forth certain agreements, covenants and commitments of Palmer Renewable Energy, LLC (hereinafter "Palmer") relating to the development and construction of a biomass renewable energy generation facility on property located at 1000 Page Boulevard in Springfield, Massachusetts (hereinafter the "Project"). The agreements, covenants and commitments contained herein are subject to receipt of all required approvals for the construction and operation of the Project, including but not limited to the following.

1. The issuance by the City Council of the City of Springfield of a special permit for the Project containing conditions satisfactory to Palmer Renewable Energy, LLC.

2. Receipt of all necessary permits from the Commonwealth of Massachusetts.

3. Approval of the necessary equity and debt financing for the development, construction and operation of the facility.

Upon receipt of the foregoing and commencement approval of construction of the facility, Palmer hereby agrees as follows:

A. The construction of the facility, including but not limited to the building size, architecture, landscaping, site lighting, parking, access, egress and signage will be substantially in accordance with the plan as set forth in the Special Permit.

B. Although, the site will operate on a twenty-four (24) hour basis, delivery of fuel shall occur only between the hours of 6:00 A.M.. and 7:00 P.M.., for six (6) days per week, Monday through Saturday. The starting times for Saturday deliveries will be discussed as necessary.

C. The site will be developed to allow for adequate queuing of trucks within the perimeters of the site eliminating queuing on Cadwell Drive. Initially, trucks coming to and from the site will utilize Page Boulevard, however this route will be reviewed within three (3) to six (6) months of the commencement of operations in order to determine if the alternate use of Route 141 should be considered.

D. Strict adherence to the laws and regulations of the Commonwealth of Massachusetts with respect to engine idling shall be enforced. There will be no queuing on public roads by trucks entering the facility

E. Representatives of Palmer will meet every three (3) months during the first year of operation, and at least semi-annually with the East Springfield Neighborhood Council to provide progress reports and address any ongoing concerns.

F. Palmer will provide the required Host Community Benefits set forth on the attached Exhibit "A."

* * * *

Please acknowledge your agreement and understanding of the foregoing on the line provided for that purpose below.

Very truly yours,

FRANK P. FITZGERALD
Attorney for Palmer Renewable Energy, LLC

* * * * *

The above letter is approved in its terms.

CITY OF SPRINGFIELD

By: David Panagore
DAVID PANAGORE
Date: 9.23.08

EAST SPRINGFIELD NEIGHBORHOOD COUNCIL

By: Kathleen Brown
KATHLEEN BROWN
Date: 9.23.08

EXHIBIT "A"

HOST COMMUNITY BENEFIT

1. Truck Route Restrictions. The City will request that the project owner agree to specific route restrictions for all truck traffic to and from the City.

2. Public Infrastructure Improvements. The City will request that the project owner agree, within three (3) to five (5) years of commencement of construction, to provide in the vicinity of the Facility, the following community benefits:

Community Benefit	Proposed Cost	Note
Paving of local streets	$200,000.00	
Replace 30 streetlights along Page Boulevard between St. James Avenue and Roosevelt Avenue with 60 decorative streetlights	$300,000.00	$5,000/light
Street trees throughout area	$100,000.00	$800/tree plus stump removal and trimming where needed
Demolition of old firehouse	$25,000.00	$5/square foot
Banners (40)	$12,00.00	$300/banner includes hardware
Gateway signage with landscaping at old firehouse location	$30,000.00	Signage, landscaping, irrigation
TOTAL	$667,000.00	

3. City Inspection and Access Rights. The City will request that the project owner agrees to provide the City with unrestricted access to the Facility for purposes of inspection and monitoring.

9-23-08

4. Community Right-To-Know Information. The City will request that the project owner provide to a designated City contact all reports and data submittals that are submitted to the Massachusetts Department of Environmental Protection (MassDEP), at the same time they are submitted to MassDEP. Such reports should include, by way of example, stack test results, emission inventories, excess emission reports and waste generation reports.

9-23-08

5. Noise Reduction Enhancements.

   A. The City will request that the project owner agree to install equipment mufflers on all outdoor engines at the Facility, and self-adjusting backup alarms on all vehicles in use at the Facility.

   B. The City will request that the project owner commit to comply with (i) the MassDEP Noise Requirements (310 CMR 7.10 and DEP Noise Policy), and (ii) the City's Noise Ordinance (Chapter 7.20).

   C. The City will request that the project owner agree that any fuel screening, grinding, chipping, or shredding activities will be performed in fully enclosed structures.

6. City Hiring Preference. The City will request that the project owner agree to (i) provide a hiring preference for residents of the City, and (ii) work with community social service employment organizations to enhance employment opportunities in the community.

7. Assistance with City's Waste Wood. The project owner will commit to manage, and process up to 7,000 cubic yards per year of the City's waste wood generated by the Park and Forestry Department, providing the City delivers the waste wood to a mutually agreed upon site. The project owner and the City will also, in good faith, explore the possibility of entering into other agreements relative to the management and processing of other waste wood generated by the City.

   In connection with the utilization of waste wood as a fuel, the project owner will insure that appropriate inspection protocols are in place with respect to infestation.

8. Insurance. The City will request that the project owner obtain and carry a reasonable amount of liability insurance to ensure that there are financial resources available to indemnify the City and to respond to an adverse casualty event such as fire or explosion. The City will seek to be added as an additional insured on such insurance to ensure that funds are available should the then current owner not be willing to respond following an event. The project owner will provide the City with a certificate showing the City as "additional insured."

9. Public Education. The City will request that the project owner agree to fund the development of, and implement, a green energy education program for the City's school department in consultation with the City's Superintendent. Proposed value of benefit: $25,000 annually, escalated by the CPI.

10. Consultant Costs. The City will request that the project owner agree to fund the actual costs to the City for environmental, engineering,and energy consulting fees and legal fees incurred in (i) evaluating and permitting the project in the approximate amount of $30,000.00, and (ii) negotiating a host community agreement. The City will also