The Commonwealth of Massachusetts
Executive Office of Health and Human Services
Department of Public Health
Bureau of Environmental Health
250 Washington Street, Boston, MA 02108-4619
Phone: 617-624-5757 Fax: 617-624-5777
TTY: 617-624-5286



November 18, 2009

Mr. Daniel Hall
Solid Waste Section Chief
Executive Office of Energy and Environmental Affairs
Massachusetts Department of Environmental Protection
Bureau of Waste Prevention, Western Region
436 Dwight Street
Springfield, MA 01103

Dear Mr. Hall:

The purpose of this letter is to provide comments relative to the October 28, 2009 Beneficial Use Determination (BUD) Permit - Provisional Permit Approval for the Palmer Renewable Energy, LLC (PRE), which proposes to build a 38 megawatt electric energy generation plant at 1000 Page Boulevard in Springfield, Ma. PRE proposes to burn an average of 700 tons per day (maximum of 900 tons per day) of Construction and Demolition (C&D)-derived wood fuel. PRE is separately seeking approval for their air pollution control plan, which aims to burn other fuels including green (virgin) wood fuel and natural gas along with, or in lieu of, C&D-derived wood fuels. It is our understanding that the issuance of a draft air permit is separate and distinct from the BUD.

According to the MassDEP Draft Interim Guidance for BUD (March 18, 2004), the applicant must make an adequate demonstration that public health, safety, welfare and the environment will not be endangered because of the beneficial use for the BUD to be approved. However, our careful review of the October 28, 2009 BUD Permit - Provisional Permit Approval for the Palmer Renewable Energy, the June 6, 2008 Certificate of the Secretary of Energy and Environmental Affairs (EEA) on the Environmental Notification Form (ENF) for the Palmer Renewable Energy (EEA Number: 14243), as well as the Fuel Sampling and Analysis Report/Proposed Fuel Specification by Epsilon Associates, Inc (August 1, 2007) indicates that no health impact assessment (HIA) has been conducted for this proposed facility.

The first step in conducting a HIA is to identify the contaminants of concern (COCs). Burning C&D waste raises public health concerns because emissions from burning green wood and wood adulterated with chemicals can be potentially hazardous. It is our understanding that the proposed biomass plant will be equipped with extensive air pollution control equipment to

minimize the release of these contaminants; however, yearly potential emissions are proposed to be as follows: 133.8 tons of NOx, 156.1 tons of CO, 22.3 tons of VOCs, 45.7 tons of $PM_{10}$, 45.7 tons $PM_{2.5}$, and 44.6 tons of $SO_2$. According to the 2007 Massachusetts Construction & Demolition Debris Industry Study, over 20% of the wood is considered adulterated with paint or other chemicals (e.g., chromated copper arsenate (CCA) treated wood). Given that these chemicals and trace metals are likely to be released in the emission stream, we believe more information is needed on the speciation and behavior of chemicals and trace elements during combustion, including the effects of different process variables, as well as of different fuels and fuel mixtures (Lundholm et al., 2007[1]). Further, the complex mixture associated with the combustion emissions is likely to result in the adsorption of trace metals and other chemicals to fine particles which, when inhaled, delivers these pollutants deep into the lung. For example, a study evaluating the fate of copper, chromium, and arsenic during combustion of CCA treated wood demonstrated that the fine particle fraction in flue gas contains particles with arsenic as $KH_2AsO_4(s)$ and $As_2O_3(s)$ and particles containing hexavalent chromium in the form of $K_2CrO_4$ or as a solid solution (Lundholm et al., 2007).

The second step of the HIA is quantifying environmental exposures from plant operations. This important step requires that the emissions of COCs from the proposed plant be quantified and modeled to predict upper-bound and average short-term and long-term ambient air concentrations. However, the quantification of COCs is particularly difficult to predict because the composition of C&D waste varies significantly depending on such factors as the type and age of building materials associated with the source of the demolition. In addition, PRE expects to burn C&D waste from other states but the availability and quality of data associated with C&D waste is not consistent among the Northeast states making comparisons highly uncertain (NEWMOA, 2009).

The MassDEP's BUD guidance recognized this inherent problem. For that reason, the MassDEP guidance recommends that statistically-based testing of representative samples be conducted in a transparent manner. However, the PRE BUD appears to be based on a single sampling and analysis program (20 samples) at one facility in Massachusetts (i.e., NER in Taunton, MA). Thus, there is considerable uncertainty not only in characterizing C&D waste in this facility but also in applying these data to other facilities in Massachusetts. The confidence in the dataset is further weakened when the data are considered somehow representative of out-of-state suppliers that not only have different definitions of C&D waste but, importantly, are not required to comply with Massachusetts rules, regulations or guidance.

Given the variability of the C&D waste stream, we believe that the overall approach of the BUD to retrospectively determine whether the fuel is meeting permit specifications is not sufficiently health protective. This includes the requirement that PRE notify MassDEP in writing of deviations in operations after they have occurred. We do not believe that visual inspection of the waste stream is an adequate method for determining the extent of contamination in the C&D waste stream. A robust and rigorous prospective sampling program would ensure that the emission limits are indeed complied with by the source.

Finally, and perhaps of greatest importance in the evaluation of health impacts associated with the proposed facility, is the need to consider the baseline health status in Springfield residents who may experience the increased exposures from facility operations. When reliable health surveillance data are available they should be relied upon more heavily to determine health

---

[1] Lundholm K, Boström D, Nordin A, Shchukarev A. Fate of Cu, Cr, and As During Combustion Of Impregnated Wood With And Without Peat Additive. Environ Sci Technol. 2007 Sep 15;41(18):6534-40.

impacts and risks. Springfield area residents asked our office to review readily available health data. We reviewed health outcome data for the area because the cumulative exposure to air pollution, including emissions from the proposed facility, may results in adverse impacts to nearby residents, especially individuals with preexisting respiratory or cardiovascular disease. This information is summarized below and provided in the attached letter.

For schools in Springfield located within 2 miles of the proposed site, five of the schools (Hiram L Dorman, Mary O Pottenger, Samuel Bowles, Thomas M Balliet, and the Van Sickle Middle School) reported statistically significantly higher pediatric asthma prevalence than the statewide prevalence for each of the three school years. It should be noted that the Samuel Bowles School is less than one mile to the west of the proposed site and the closest school to the proposed site. For hospitalization data for Springfield residents, the rates of hospitalization for asthma (i.e., hospital emergency room visits) as compared to statewide rates during the years 2004 through 2006 were statistically significantly higher than the state rate for each of the three years. Specifically, the age-adjusted rates were over twice the statewide rates. However, the age-adjusted rates for Springfield residents hospitalized for myocardial infarction are about the same as the statewide rate. Finally, the prevalence of blood lead levels greater than a level of concern of 10 µg/dL is about twice the statewide rates. Based on the available data and previous work with EEA, we believe that consideration should be given that Springfield be designated an Environmental Justice community for the purposes of this proposed project.

In summary, we believe the optimal approach to evaluating the public health impacts associated with the proposed facility and to best respond to resident concerns would involve conducting a comprehensive HIA that includes a more representative sampling and analysis program of the C&D waste stream.

If you have any questions, please call us 617-624-5757.

Sincerely,

Suzanne K. Condon, Associate Commissioner
Director, Bureau of Environmental Health

cc: Martha Steele, Deputy Director, BEH
Margaret Round, Senior Environmental Analyst, BEH, Environmental Toxicology Program
Helen Caulton Harris, Department of Health and Human Services, Springfield, MA

The Commonwealth of Massachusetts
Executive Office of Health and Human Services
Department of Public Health
Bureau of Environmental Health
250 Washington Street, Boston, MA 02108-4619
Phone: 617-624-5757 Fax: 617-624-5777
TTY: 617-624-5286

DEVAL L. PATRICK
GOVERNOR

TIMOTHY P. MURRAY
LIEUTENANT GOVERNOR

JUDYANN BIGBY, M.D.
SECRETARY

JOHN AUERBACH
COMMISSIONER

October 2, 2009

Ms. Michaelann Bewsee
25 Churchill Street
Springfield, Massachusetts 01108

Dear Ms. Bewsee:

The purpose of this letter is to respond to your request for an evaluation of health and environmental concerns related to the proposed Palmer Renewable Energy Plant to be located at 1000 Page Boulevard in Springfield. The proposed 38 MW electric generating plant is a biomass facility to be located in an industrial area adjacent to an existing asphalt plant operated by Palmer Paving.

According to the June 6, 2008 MEPA certificate, the proposed plant will use a wood-fired stoker boiler to convert approximately 900 tons of per day (tpd) of wood fuel consisting of 700 tpd of recycled wood from Construction and Demolition (C&D) processors and 200 tpd of "green" wood chips into combustible gas, which would eventually generate 38 Megawatts of energy.

Although C&D waste is not considered eligible biomass fuel, it is our understanding that pre-sorted C&D waste will be re-characterized as "recycled" wood under the Massachusetts Department of Environmental Protection (MassDEP) beneficial use determination (BUD) regulation and guidance (310 CMR 19.060). Thus, approximately 230,000 tons per year (tpy) of C&D wood fuel for the proposed Palmer facility is expected to be derived from a number of existing in-state and out-of-state C&D processing facilities that physically pre-sort recycled wood from adulterated wood and non-wood materials such as plastics or inorganic materials.

The definition of C&D waste in Massachusetts is: waste resulting from construction, remodeling, repair, or demolition of buildings, pavements, roads, or other structures. The waste stream from construction, repair, and/or remodeling activities consists of a variety of building waste including asphalt roofing shingles, gypsum wallboard, and wood products including lumber, siding, laminates, flooring, and painted wood. Demolition waste from older buildings, for example, includes concrete, wood, metals, insulation, electrical materials, plumbing pipes and fixtures, and wood possibly containing lead paint. According to the 2007 Massachusetts Construction & Demolition Debris Industry Study, over 20% of the wood is considered adulterated with paint or other chemicals (e.g., chromated copper arsenate (CCA) treated wood). However, the

composition of construction and demolition debris varies significantly depending on the type of construction/demolition project.

Incineration of "green" wood and recycled C&D waste wood results in the generation of combustion-related air pollutants including carbon monoxide (CO), oxides of nitrogen (NOx), sulfur dioxide ($SO_2$), volatile organic compounds (VOCs), hazardous air pollutants (HAPs; e.g., acid gases, dioxins/furans), polycyclic aromatic hydrocarbons (PAHs), course particles [$PM_{10}$- less than 10 micrometers in diameter] and fine particles [$PM_{2.5}$ - 2.5 micrometers or less in diameter]. In addition, contaminants contained in the C&D adulterated wood that are generated from combustion include heavy metals (e.g., chromium, copper, arsenic, lead), pesticides, and wood preservatives (e.g., pentachlorophenol). According to the May 7, 2008 MEPA certificate the proposed Palmer plant exhaust from the boiler will be ducted to a scrubber, fabric filter, oxidation catalyst and Regenerative Selective Catalytic Reduction (RSCR) system and then to a 275 foot tall stack. Other equipment on site will include silos for lime, carbon and ash, and a double-walled aqueous ammonia tank for the RSCR.

According to the MEPA certificate emissions estimates from the proposed facility after controls are estimated to be: 27 tpy $PM_{10}$, 167 tpy CO, 0.28 tpy lead, 47 tpy $SO_2$, 22 tpy VOCs, 134 tpy NOx and 23.8 tpy of HAPs. In addition to stack emissions, air quality impacts from the operation of the facility also include emissions from diesel trucks delivering fuel, and emissions from equipment associated with the operation of the proposed facility. Fine particle and fugitive emissions were not included in the Environmental Notification Form (ENF) but were requested in the MEPA certificate to be included in the final air permit. Epidemiological evidence has demonstrated a relationship between exposure to fine particles at levels below the current national ambient air quality standard (NAAQS) and respiratory and cardiovascular morbidity and premature mortality in exposed populations so this type of additional information will be valuable.

In follow-up to your discussion with Margaret Round, Senior Analyst for Air Toxics in our Environmental Toxicology Program, MDPH/BEH also reviewed readily available data on the occurrence of asthma and cardiovascular conditions in Springfield residents. We reviewed these health outcomes because individuals with preexisting respiratory or cardiovascular disease are more vulnerable to exposure to air pollution.

As part of this review, MDPH/BEH evaluated pediatric asthma for Springfield school children for schools. MDPH/BEH has been conducting statewide pediatric asthma surveillance since the 2003-2004 school year. Pediatric asthma data are reported by school nurses at schools with at least some of grades K-8. An earlier study carried out by MDPH/BEH in the Merrimack Valley region of the state demonstrated 96 percent agreement between doctor diagnosed asthma and school based asthma numbers, so the data are adequate for evaluation/comparison.

Figure 1 shows the participating schools in Springfield and surrounding communities, as well as the location of the proposed transfer station. Table 1 shows the pediatric asthma data for school years for the last three school years (i.e., 2004-2005, 2005-2006 and 2006-2007). The pediatric asthma prevalence for the schools in Springfield located closest to the proposed site (Samuel Bowles Elementary School, Mary O. Pottenger Elementary School, and the Van Sickle Middle School) is statistically significantly higher than statewide prevalence for each of the three school years. It should be noted that the Samuel Bowles School is less than one mile to the west of the proposed site and the closest school to the proposed site.

MDPH/BEH also evaluated asthma and cardiovascular hospitalization data available for Springfield residents. Hospitalization data are housed in the Massachusetts Division of Health

Care Finance and Policy and are readily available through MassCHIP (Massachusetts Community Health Information Profile), a computerized database accessible to the general public and researchers. These data include all Springfield hospitalizations regardless of age and are available on MassCHIP by community and not at smaller geographical levels (e.g., zip code).

Table 2 shows asthma hospitalization data for Springfield residents as compared to statewide rates. During the years 2004 through 2006 the rates of asthma-related hospitalizations for Springfield residents were statistically significantly higher than the statewide rates for each of the three years. Specifically, the age-adjusted rates were over twice the statewide rates. However, as shown in Table 3, the age-adjusted rates for Springfield residents hospitalized for myocardial infarction are about the same as the statewide rate.

It is important to note that asthma is a multifactorial lung disease that is often associated with familial, allergenic, socioeconomic, psychological, and environmental factors. Studies have shown disparities in hospitalization rates for asthma by race/ethnicity and income. Hospitalization counts are based on the number of episodes (event based) rather than the number of patients (person based). As a result, the number of hospitalizations could indicate admissions for different individuals or re-admissions for the same person. Hospitalizations for asthma does not reflect the prevalence of the disease in the population but other conditions such as uncontrolled asthma conditions, limited access health care services, and/or inadequate medical treatment practices.

You also specifically requested information on blood lead levels in Springfield residents. The Massachusetts Lead Poisoning Prevention and Control Act requires all children up to age 3 years (up to 4 years old for those children in high risk communities and up to age 6 for a child entering kindergarten who has never been screened before) to have a blood test for lead. The Centers for Disease Control and Prevention (CDC) currently considers a blood lead level (BLL) of 10 micrograms per deciliter (μg/dL) or greater to be a "level of concern" that should be followed by public health officials. Table 4 shows the prevalence of BLL for children tested in Springfield for 2006, 2007 and 2008. The prevalence rate for children with BLL greater than 10 μg/dL is 15.5 per 1000, 15.8 per 1000, and 9.5 per 1000 for 2006, 2007, and 2008, respectively. These rates are about twice the statewide rates of BLL greater than 10 μg/dL (i.e., 8.5 per 1000 in 2006, 6.7 per 1000 in 2007 and 5.0 per 1000 in 2008.)

It is our understanding that the Secretary of the Executive Office of Energy and Environmental Affairs (EOEEA) determines whether or not to consider the Environmental Justice policy for specific MEPA projects. It is our further understanding that EOEEA did not require this project to meet Environmental Justice criteria.

In summary, the data reviewed by MDPH/BEH indicates that respiratory disease among the pediatric population attending school in relatively close proximity to the proposed facility is significantly higher than the statewide rates. In addition, Springfield residents in general have higher rates of respiratory disease but not myocardial infarction. Finally, the prevalence of blood lead levels in children tested in Springfield is about twice the statewide rates. Although site-specific data are limited at this stage of the proposed project, we do believe as stated that some additional information on the potential increase in emissions from the operation of this facility, including mobile sources and respiratory irritants (e.g., fine particles, acid gases (HF, HCL), lead, aldehydes) may be helpful in ensuring that the facility will not impact or exacerbate existing health conditions of nearby residents. In this regard, mitigation of emissions (e.g., diesel retrofit control technology on trucks associated with facility operations) should also be considered.

We hope this information is helpful to you. If you have any questions, please feel free to contact us at 617-624-5757.

Sincerely,

Suzanne K. Condon, Associate Commissioner
Director, Bureau of Environmental Health

cc: Martha J. Steele, Deputy Director, MDPH/BEH
Meg Blanchet, Assistant Director, Environmental Toxicology Program, MDPH/BEH
Margaret Round, Environmental Toxicology Program, MDPH/BEH

## Table 1: Pediatric Asthma Rates By School in Springfield, Massachusetts

| School | 2004-2005 Prevalence | | 2005-2006 Prevalence | | 2006-2007 Prevalence | |
|---|---|---|---|---|---|---|
| Alfred G Zanetti | 11.9 | 8.6-15.3 | 6.2 | 3.8-8.7 | 4.75 | 2.55-6.95 |
| Alice B Beal | 10.2 | 6.8-13.6 | 11.3 | 7.6-15 | 11.94 | 8.33-15.55 |
| Arthur T Talmadge | 11.3 | 7.7-14.8 | 13 | 9.3-16.7 | 18.75* | 14.24-23.26 |
| Boland | 18.2* | 14.6-21.8 | 22.5* | 18.8-26.2 | 24.28* | 20.59-27.97 |
| Brightwood | 17.6* | 13.7-21.5 | 21.9* | 17.8-26 | 19.46* | 15.61-23.31 |
| Chestnut Accelerated | 13.4* | 11.5-15.3 | 18.2* | 16.1-20.4 | 20.69* | 18.35-23.03 |
| Curtis Blake Day | 6.3 | 0.9-11.6 | 13.2 | 5.6-20.8 | N/A | N/A-N/A |
| Daniel B Brunton | 20.6* | 17-24.1 | 18.1* | 15-21.3 | 16.73* | 13.63-19.83 |
| Dryden Memorial | 18* | 13.2-22.9 | 20.2* | 15.5-25 | 9.84 | 6.18-13.5 |
| Elias Brookings | 20.2* | 16.7-23.7 | 18.6* | 15.1-22.2 | 20.21* | 16.64-23.78 |
| Forest Park | 15.5* | 13.1-17.8 | 15.7* | 13.5-18 | 14.6* | 12.45-16.75 |
| Frank H Freedman | 21.6* | 16.2-27 | 21.9* | 16.4-27.4 | 19* | 13.83-24.17 |
| Frederick Harris | 16.8* | 13.8-19.8 | 16.2* | 13.1-19.2 | 17.75* | 14.61-20.89 |
| Gerena | 20.9* | 17.7-24.2 | 42.6* | 38.8-46.5 | 20.67* | 17.56-23.78 |
| Glenwood | 18.6* | 14.7-22.6 | 18.6* | 14.6-22.5 | 20.12* | 15.88-24.36 |
| Glickman | 18.1* | 13.4-22.8 | 16* | 11.8-20.2 | 17.59* | 13.21-21.97 |
| Hiram L Dorman | 16.9* | 12.4-21.3 | 17.4* | 12.5-22.2 | 15.79* | 11.06-20.52 |
| Holy Cross | N/A | N/A-N/A | 6.1 | 3.7-8.5 | 3.34 | 1.55-5.13 |
| Holy Name | N/A | N/A-N/A | 8.1 | 4.3-11.9 | 6.09 | 2.75-9.43 |
| Homer Street | 22.7* | 18.6-26.7 | 3.8 | 1.8-5.8 | 2.45 | 0.77-4.13 |
| Hughes Academy Charter | N/A | N/A-N/A | N/A | N/A-N/A | 12.22 | 7.44-17 |
| John F Kennedy | 13.1* | 10.6-15.5 | 13.3 | 10.7-15.9 | 17.37* | 14.38-20.36 |
| John J Duggan | 14.3* | 12-16.7 | 16.7* | 14-19.5 | 14.01* | 11.57-16.45 |
| Kathleen Thornton | N/A | N/A-N/A | 20.8 | 4.6-37.1 | 20 | 2.47-37.53 |
| Kensington Avenue | 18.2* | 14.4-22.1 | 19.9* | 15.9-23.9 | 19.29* | 15.08-23.5 |
| Liberty | 9.6 | 6.2-13.1 | 13.4 | 9.4-17.5 | 19.03* | 14.5-23.56 |
| Lincoln | 19.2* | 15.2-23.2 | 25.4* | 20.9-29.9 | 27.78* | 23.26-32.3 |
| M Marcus Kiley | 16* | 13.8-18.3 | 14.9* | 12.6-17.1 | 17.15* | 14.74-19.56 |
| Margaret C Ells | 10.8 | 7.1-14.4 | 12.6 | 6.7-18.6 | 10.34 | 4.8-15.88 |
| Martin Luther King Jr. Charter | N/A | N/A-N/A | N/A | N/A-N/A | 16.11 | 10.74-21.48 |
| Mary M Lynch | 13.3 | 9.3-17.2 | 20.8* | 16.1-25.5 | 20.2* | 15.63-24.77 |
| Mary M Walsh | 25.6* | 21.6-29.7 | 28.8* | 24.6-33.1 | 17.42* | 13.79-21.05 |
| **Mary O Pottenger** | **20.9*** | **17.2-24.7** | **20.8*** | **16.9-24.8** | **19.37*** | **15.56-23.18** |

## Table 1: Pediatric Asthma Rates By School in Springfield, Massachusetts

| School | 2004-2005 Prevalence | | 2005-2006 Prevalence | | 2006-2007 Prevalence | |
|---|---|---|---|---|---|---|
| Mill Pond | N/A | N/A-N/A | 35.7 | 10.6-60.8 | N/A | N/A-N/A |
| Milton Bradley | 15.2* | 12.4-18.1 | 23.2* | 19.7-26.6 | 26.22* | 22.69-29.75 |
| Mount Carmel | N/A | N/A-N/A | 5.1 | 1.1-9.1 | 7.48 | 2.5-12.46 |
| Our Lady of Hope | 11.1 | 7.8-14.4 | 9.1 | 6-12.2 | 3.21 | 1.15-5.27 |
| Our Lady Sacred Heart | N/A | N/A-N/A | N/A | N/A-N/A | 3.44 | 1.44-5.44 |
| Pioneer Valley Christian | N/A | N/A-N/A | 7.9 | 3.4-12.4 | 6.33 | 2.53-10.13 |
| Pioneer Valley Montessori | N/A | N/A-N/A | 11.9 | 2.1-21.7 | 7.69 | 0.45-14.93 |
| Rebecca M Johnson | 18.9* | 15.9-21.9 | 24.9* | 21.4-28.4 | 25.04* | 21.52-28.56 |
| Sabis International Charter | 13.8* | 11.7-15.9 | N/A | N/A-N/A | 18.07* | 15.74-20.4 |
| **Samuel Bowles** | **18.2*** | **14.2-22.1** | **19*** | **14.8-23.3** | **16.1*** | **12.09-20.11** |
| Sumner Avenue | 19.7* | 16.1-23.4 | 16.4* | 12.8-19.9 | 16.49* | 13.1-19.88 |
| The Macduffie School | 11.7 | 3.5-19.8 | 12.7 | 4.5-20.9 | 15.09 | 5.45-24.73 |
| Thomas M Balliet | 23.2* | 17.8-28.6 | 20.6* | 15.4-25.8 | 21.07* | 16.12-26.02 |
| **Van Sickle** | **13*** | **10.9-15** | **15.5*** | **13.4-17.6** | **18.15*** | **15.91-20.39** |
| Warner | 14.6* | 10.3-18.8 | 15.4* | 10.8-19.9 | 20.77* | 15.84-25.7 |
| Washington | 15.6* | 11.6-19.5 | 19.5* | 14.7-24.4 | 19.08* | 14.66-23.5 |
| White Street | 19.4* | 15.7-23 | 18* | 14.2-21.8 | 15.45* | 11.83-19.07 |
| William N Deberry | 21.3* | 16.5-26.2 | 19.3* | 14.7-23.9 | 16.16* | 11.97-20.35 |
| **State Totals** | **10.0** | **9.9-10.1** | **10.6** | **10.5-10.7** | **10.8** | **10.7-10.9** |

* Statistically significant determined by comparing school prevalence with overall state prevalence for given year.
N/A - Not reported

## Table 2: Asthma-related Hospitalizations: Age-Adjusted Rate Per 100,000 (with 95% C.I.): Springfield

| | | 2004 | 2005 | 2006 |
|---|---|---|---|---|
| **Springfield** | Total Population | 1602.68 (1538.49-1666.88) * | 1703.66 (1637.93-1769.38) * | 1877.29 (1808.36-1946.21) * |
| **Statewide** | Total Population | 773.25 (766.56-779.93) | 814.46 (807.60-821.32) | 862.74 (855.68-869.79) |

* Statistically significantly higher

1. Parentheses are 95 percent confidence intervals
2. Age adjustment is used to compare risks of two or more populations at one point in time or one population at two or more points in time. Age-adjusted rates are computed by the direct method by applying age-specific rates in a population of interest to a standardized age distribution, in order to eliminate differences in observed rates that result from age differences in population composition. Age-adjusted rates should be viewed as relative indexes rather than actual measures of risk.

## Table 3: Acute Myocardial Infarction Hospitalizations: Age-Adjusted Rate Per 100,000 (with 95% C.I.): Springfield

| | | 2004 | 2005 | 2006 |
|---|---|---|---|---|
| **Springfield** | Total Population | 248.70 (223.09-274.31) | 207.32 (183.89 – 230.75) | 184.95 (162.88 – 207.02) |
| **Statewide** | Total Population | 231.97 (228.2-235.52) | 214.49 (211.08-217.89) | 204.77 (201.46-208.08) |

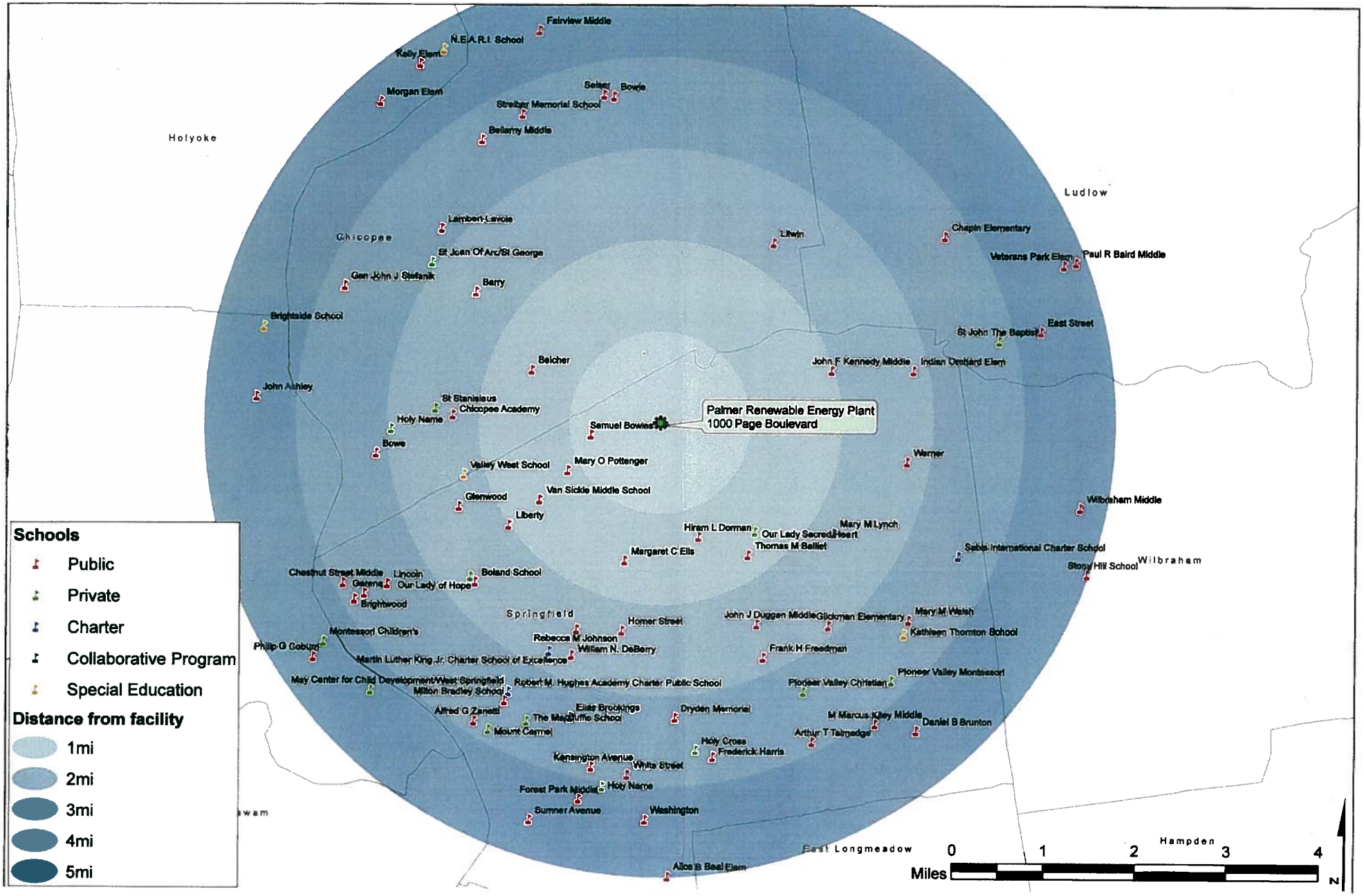
** Statistically significantly higher

1. Parentheses are 95 percent confidence intervals
2. Age adjustment is used to compare risks of two or more populations at one point in time or one population at two or more points in time. Age-adjusted rates are computed by the direct method by applying age-specific rates in a population of interest to a standardized age distribution, in order to eliminate differences in observed rates that result from age differences in population composition. Age-adjusted rates should be viewed as relative indexes rather than actual measures of risk.

## Table 4: Prevalence and Rate Per 1,000 of Blood Lead Levels in Springfield

| | 2006 | | 2007 | | 2008 | |
|---|---|---|---|---|---|---|
| **Springfield** | **Prevalence** | **Rate per 1,000** | **Prevalence** | **Rate per 1,000** | **Prevalence** | **Rate per 1,000** |
| <10 µg/dL | 7,884 | 979.9 | 7,698 | 979.3 | 8,087 | 986.2 |
| 10 – 14 µg/dL | 125 | 15.5 | 124 | 15.8 | 78 | 9.5 |
| 15 + µg/dL | 37 | 4.6 | 39 | 5.0 | 35 | 4.3 |
| **Total** | **8,046** | | **7,861** | | **8,200** | |
| **Statewide** | **Prevalence** | **Rate per 1,000** | **Prevalence** | **Rate per 1,000** | **Prevalence** | **Rate per 1,000** |
| <10 µg/dL | 220,595 | 988.8 | 223,268 | 990.9 | 223,537 | 993.0 |
| 10 – 14 µg/dL | 1,889 | 8.5 | 1,516 | 6.7 | 1,129 | 5.0 |
| 15 + µg/dL | 609 | 2.7 | 540 | 2.4 | 445 | 2.0 |
| **Total** | **223,093** | | **225,324** | | **225,111** | |

1. Age of children when tested ranges from 9 to 71 months
2. Prevalence is the number of children with blood lead level screened
3. Rate per 1,000 is the (number of children with blood lead levels screened/number of children screened) X 1000


Palmer Renewable Energy Plant
1000 Page Boulevard
Schools
Public
Private
Charter
Collaborative Program
Special Education
Distance from facility
1mi
2mi
3mi
4mi
5mi
Holyoke
Chicopee
Springfield
Ludlow
Wilbraham
Hampden
East Longmeadow
Miles
0
1
2
3
4
N
Fairview Middle
N.E.A.R.I. School
Kelly Elem
Morgan Elem
Selser
Bowie
Streiber Memorial School
Bellamy Middle
Lambert-Lavoie
St Joan Of Arc/St George
Gen John J Stefanik
Barry
Brightside School
Litwin
Chapin Elementary
Veterans Park Elem
Paul R Baird Middle
East Street
St John The Baptist
Belcher
John F Kennedy Middle
Indian Orchard Elem
John Ashley
St Stanislaus
Chicopee Academy
Holy Name
Bowe
Samuel Bowles
Valley West School
Mary O Pottenger
Van Sickle Middle School
Glenwood
Liberty
Warner
Wilbraham Middle
Hiram L Dorman
Our Lady Sacred Heart
Mary M Lynch
Thomas M Balliet
Margaret C Ells
Sabis International Charter School
Stony Hill School
Chestnut Street Middle
Lincoln
Boland School
Gerena
Our Lady of Hope
Brightwood
Homer Street
John J Duggan Middle
Glickman Elementary
Mary M Walsh
Kathleen Thornton School
Montessori Children's
Philip G Coburn
Rebecca M Johnson
William N. DeBerry
Martin Luther King Jr. Charter School of Excellence
Frank H Freedman
May Center for Child Development/West Springfield
Robert M. Hughes Academy Charter Public School
Pioneer Valley Christian
Pioneer Valley Montessori
Milton Bradley School
Alfred G Zanetti
Elias Brookings
The Maj Duffy School
Dryden Memorial
M Marcus Kiley Middle
Daniel B Brunton
Mount Carmel
Arthur T Talmadge
Holy Cross
Frederick Harris
Kensington Avenue
White Street
Forest Park Middle
Holy Name
Sumner Avenue
Washington
Alice B Beal Elem