



STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION



November 13, 2006

Daniel Caruso, Chairman
Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051

RE: 37.5 MW Wood Biomass Generating Plant
Plainfield Renewable Energy LLC
Plainfield, Connecticut
Petition No. 784

Dear Chairman Caruso:

Staff of this department have reviewed the above-referenced petition for a declaratory ruling that the construction and operation of a 37.5 MW wood biomass gasification generating plant will not have a substantial environmental impact and will not require a Certificate of Environmental Compatibility and Public Need. DEP has had pre-application discussions with the applicant and has received two permit applications to date, with additional applications anticipated. No site visit was undertaken during the department's review of this petition. The following comments are offered to the Council for your use in this proceeding.

The 2006 State Solid Waste Management Plan, which will see final adoption later this month, sets forth a new direction for solid waste management in Connecticut in which waste products will be handled as resources which can be put to productive use or reuse. The Plainfield Renewable Energy proposal presents an opportunity to create a beneficial use for a portion of Connecticut's waste stream which is currently not recycled, reused, recovered for energy, or otherwise removed from the waste stream. Only approximately seven percent of Connecticut's construction and demolition wastes are currently recycled or otherwise diverted from the waste stream. Most of this material is simply landfilled, the bulk of it out-of-state. Though there are some beneficial uses for land clearing debris such as chipping for mulch, compost, or fuel, most of it is either left on site to decay, burned, or illegally dumped or buried.

Air Permit

The DEP Bureau of Air Management received a New Source Review permit application for the Plainfield Renewal Energy facility on August 8, 2006. DEP's review of this application is in its very early stages. We have found that wood biomass gasification projects in New England are currently limited to several very small facilities in Maine. Larger wood gasification plants (30-50 MW) are currently being proposed in New Hampshire, Massachusetts, and

elsewhere in Connecticut. Although DEP's review of the Plainfield application is at a very early stage, we concur with the assertion made in the petition that approximately 210 tons of NOx emissions reduction credits will be required to offset the plant's anticipated 175 tons per year of NOx emissions at a 1.2:1 ratio. Such credits are getting more difficult to obtain but sufficient credits from downwind sources in serious or severe NOx non-attainment areas are available, chiefly from New York.

It is always difficult to speculate with any great accuracy just what other generating facilities would be displaced or partially displaced by a new generating plant, and such is the case with the Plainfield plant. Such decisions are largely under the control of ISO-New England. New baseload generation, such as proposed here, may displace the need for some amount of spinning reserve capacity, which would have the benefit of eliminating those associated emissions. With an emissions rate of approximately 1.05 pounds of NOx per megawatt-hour, the Plainfield plant will have a much higher emissions factor per megawatt-hour than combined cycle plants but below those of baseload coal and oil-fired plants, and well below those of peaking power facilities. Depending on the generating option displaced by the operation of Plainfield Renewable Energy, there is a potential for some air quality benefit.

The situation is somewhat different for CO₂ emissions however. The emissions of the Plainfield plant, at approximately 2,900 pounds of CO₂ emitted per MW-hour, are greater than any other Connecticut baseload or peaking power facility. CO₂ is not yet a regulated pollutant but that will change when Connecticut incorporates the Regional Greenhouse Gas Initiative (RGGI) regulatory requirements into our permitting process. The RGGI limits will not apply to biomass facilities that commenced operation prior to January 1, 2005 as long as the fossil fuel component of their fuel use is less than 50% in any year. This fossil fuel threshold will be 5% for units that commence operation on or after January 1, 2005. However, since the emergency generator is the only Plainfield plant component using fossil fuel, the fossil fuel component of the plant's overall fuel supply will be below this threshold. Therefore, this plant will not be subject to the CO₂ emissions limitation contained in RGGI so long as it does not combust more than 5% fossil fuel in any given year.

Volume Reduction Facility Permit

The Plainfield Renewable Energy facility will require a Volume Reduction Facility permit, application for which has been received by the department. A notice of permit sufficiency was issued on August 28, 2006. The permit will cover all aspects of the wood delivery, processing, and storage at the site and also of ash handling and disposal. Quality of the waste wood fuel component, including construction and demolition waste, will be monitored through the emissions stack testing, which includes continuous emissions monitoring (CEM), and possibly through specified periodic on-site sampling, as well as through the applicant's contracts with its fuel vendors. Connecticut General Statutes section 22a-208k contains a prohibition on the use of demolition debris originating out of state from use at wood-burning facilities in Connecticut. However, CGS section 22a-207(24) specifically exempts wood gasification plants which utilize land clearing debris, tree stumps, other biomass that regenerates, or wood fuel which will not result in the depletion of resources, from the definition of wood-burning facility. While it would appear that the use of demolition debris wood waste would qualify as a fuel which does not result in the depletion of resources, a final determination on the

applicability of CGS 22a-208k to the Plainfield facility will be made as an element of DEP's permit application review. Public Act 06-74 does not add any clarification to this point.

Diversions Permit Application

The Plainfield Renewable Energy facility will require between 656,000 and 994,000 gallons per day (gpd) for cooling water and the spray dryer system.¹ A diversion from the Quinebaug River is proposed as the source of this water. No application for this diversion has yet been received by this department.

This proposed diversion of cooling water from the Quinebaug River may be the most problematic regulatory and environmental issue arising from the proposed facility. Without prejudging an application we have not yet received, on a very preliminary basis, it appears that the quantity of water contemplated for diversion may be available. However, the DEP has long-standing concerns about chronic water quality impairments in most of the Quinebaug River main stem. Several waterbody segments and river reach segments of the Quinebaug River, the lowermost Shetucket River, and upper Thames River have been listed as impaired waterbodies for designated uses of aquatic life support and primary and/or secondary contact recreation for several years. Such impaired waterbody segment listings require State management action to restore these designated uses. The current document that details these impaired waterbody listings is the *2004 List of Connecticut Waterbodies Not Meeting Water Quality Standards*, established pursuant to the requirements of Section 303(d) of the Federal Clean Water Act, April 28, 2004.

DEP is assessing a complex set of nutrient enrichment and flow-regulated stressors on this river system through a recently published report developed through a cooperative agreement with the U.S. Geological Survey. This report, *The Thames Science Plan: Hydrological Investigations to Support Nutrient-Related Water-Quality Improvements in the Thames River Basin*, outlines water-quality investigations that will provide the information necessary for this department to develop water-quality management and restoration strategies for nutrient-related problems in the Thames River Basin. The Plan's purpose is to identify information that will support the department's development of Total Maximum Daily Load analyses (TMDLs) for nutrients for several watershed bodies and stream reaches in the Thames Basin, including the Quinebaug River main stem, as required under the Federal Clean Water Act. (The Plan is available through the U.S. Geological Survey website at: <http://pubs.usgs.gov/of/2005/1208/>.)

The Plainfield Renewable Energy diversion permit application will need to be reviewed carefully in terms of assessing water quality impacts to the Quinebaug River at, and downstream of, the proposed surface water intake and pipeline return discharge locations.

One statement on page 57 of the petition requires more clarification. The statement reads "In general, the CTDEP will not issue a water diversion permit for more than ten percent (10%) of 7-day, 10-year low flow rate." In actual practice, the department has no such rule of thumb for diversion permits. This statement also may convey the idea that a water use may consume up to 10% of the flow at 7Q10 conditions, as the 7-day, 10-year low flow condition is

¹ Twenty percent of the water volumes withdrawn would be returned to the river at the intake location, so the net diversion volumes would range from 530,000-800,000 gpd. No data on the temperature of the discharge water is given in the petition.

commonly referred to. This is not the case. The 7Q10 flow is a floor or base rate which cannot be further reduced. Diversions on a watercourse that is approaching 7Q10 conditions would be required to curtail or cease operations to assure that the 7Q10 flow levels were not violated.

Two relevant and important factors are missing from the discussion and comparison of wet and dry cooling technologies on pages 53-55 of the petition. A dry cooling system is cited as costing \$6,300,000 more than a wet cooling system and exacting a 2-3% energy penalty on an annual basis, which can rise to 4% in summer conditions. No figures are given for the cost of the 3-mile pipeline, pumps, and intake structure needed to transport the water from the Quinebaug River to the plant. Table 7 leads one to conclude that these costs are not included in the \$2,000,000 cost of the wet cooling option. The other factor not discussed in the petition is the energy penalty of pumping the needed volume of water three miles to the plant. Both the pipeline system cost and the pumping energy penalty would offset some portion of the cited cost and energy penalties of the dry cooling system. Determination of the net differential in plant output penalties between the cited 2-3% dry cooling system efficiency loss and the output penalty arising from the pumping of the cooling water from the Quinebaug River will also bear on the air emissions analysis for the plant as these cooling system penalties represent extra emissions that will occur at this plant or elsewhere to provide the marginal energy lost in plant cooling operations.

One last comment on the proposed diversion relates to the location shown on Figure 6, and in the aerial photo in Figure 2, for the diversion intake structure. The petition text leads one to conclude that the diversion will take water directly from the Quinebaug River. However, the location shown on these two figures is somewhat off the river, possibly implying the use of recharge wells. Due to the location of the intake structures being adjacent to the now-closed Yaworski landfill, any recharge wells would likely intercept leachate contaminated groundwater from that site. It is unlikely that recharge wells at this location could be permitted. However, the cross marking the intake structure location may simply be slightly mislocated on the map and photo and the intake structure may actually be directly on the river, where this specific concern would not apply.

NPDES Permits

The proposed facility will require a National Pollutant Discharge Elimination System (NPDES) permit for the stormwater discharges from the site generated during construction activities and then during actual facility operation. For the construction activities stormwater permit, a stormwater pollution control plan, including measures such as erosion and sediment controls and post-construction stormwater management, must be prepared. For sites where ten acres or more will be disturbed, which appears to be the case here, a stormwater pollution control plan must be developed and submitted to the department. A goal of 80 percent removal of total suspended solids from the stormwater discharge shall be used in designing and installing stormwater management measures. Plainfield Renewable Energy is aware of the need for this permit as evidenced by its inclusion in the discussion on pages 58-59 and 113-114 of the petition.

Similarly, the discharge of stormwater from certain industrial areas, including power plants, requires an NPDES permit pursuant to EPA regulations promulgated in November 1990. The Permitting & Enforcement Division issued a *General Permit for the Discharge of*

Stormwater Associated with Industrial Activity that will cover these discharges. The industrial activities that require a permit are defined in the regulations by Standard Industrial Classifications. Registration describing the facility and the stormwater discharge must be submitted to the Department prior to the initiation of the industrial activity. A stormwater pollution prevention plan, including measures such as a monitoring program, controls for outside storage of materials, spill control plan, maintenance and inspection, employee training and recordkeeping, must be prepared. A copy of the general permit as well as registration forms may be downloaded at: <http://dep.state.ct.us/pao/download.htm#StormwaterIndustrialGP>. For further information on either of the above permits, the applicant may contact the division at 424-3018.

Gallup Quarry Superfund Site

As described in the petition, the proposed site, formerly known as the Gallup Quarry, was the subject of a Superfund cleanup, and a portion of the site is still subject to environmental land use restrictions due to residual groundwater contamination. The petition is accurate in describing all active remedial efforts on the site as completed. Groundwater monitoring of the leachate plume is continuing in order to assess progress in plume attenuation. Any withdrawal or use of groundwater on the site, other than for water quality monitoring, is prohibited.

Wetlands Impact and Mitigation

The application describes a total of 280 square feet of wetland impact, including 190 square feet of red maple forested wetland impact and 90 square feet of impact in a disturbed isolated wetland described as an excavation in the former gravel pit. Mitigation of these impacts is described on pages 43-46 of Exhibit C.

The Council exercises inland wetlands regulatory jurisdiction for projects that come before it by application. As this project is being reviewed pursuant to a petition, it is not clear if the Council will exercise such jurisdiction, either through its decision on the petition or through a development and management plan. In either case, we note that the proposed mitigation for the red maple forested wetland impact is to create new wetland by excavating a small area adjacent to the area to be filled (Exhibit C, page 44). C.G.S. section 22a-41(4) establishes a hierarchy of priority to restore, enhance or create productive wetlands and watercourse resources to compensate for irreversible or irretrievable wetland or watercourse losses. As the mitigation proposed involves wetlands creation, the applicant must demonstrate that wetlands restoration and then wetlands enhancement are not feasible alternatives for mitigation of the on-site wetlands impacts. The same condition is relevant to the isolated wetland mitigation proposed on page 43 of Exhibit C. Monitoring of the wetlands restoration, enhancement or creation for a period of five years is a standard timeframe for determining the success of such efforts (p. C-46).

Miscellaneous Petition Commentary

The list of site selection criteria on page 88 includes rail and barge access. While it is clear that the proposed site does not offer the latter attribute, DEP is hopeful that the rail access may be used for equipment deliveries, fuel supply and ash removal to the extent possible as a strategy to reduce miles of truck travel, highway congestion, and energy consumption. Also, relative to the issue of the rail line adjacent to the site, Figure 17 following Appendix H is slightly out of date in its reference to that line as belonging to the New York, New Haven and Hartford Railroad. That railroad was acquired by Penn Central in 1968, which in turn was

incorporated into Conrail in 1976. The line was subsequently transferred to its current owner, the Providence and Worcester Railroad, in 1981.

The SACTI cooling tower plume analysis is cited as yielding an estimated salt deposition of $675 \text{ kg/m}^2/\text{month}$ (page 101 and Exhibit B, page 6). If this number were correct, this would mean 1,485 pounds of salt deposition per square meter would be deposited each month at the maximum impact area north of the cooling tower. Annually, this would be 17,820 pounds or about nine tons of salt deposition per square meter. This does not seem remotely realistic, and if realistic, would represent a major source of contamination to groundwater and surface runoff. Relatedly, the reported maximum deposition rate occurrence cited as being in 1970 (and likewise the maximum plume shadowing occurrence in 1972) for a facility which may be built in 2008 shows a misuse of the 1970-1974 wind data or more accurately carelessness in applying the historic data dates to the future modeling.

Thank you for the opportunity to review this petition and to submit these comments to the Council. Should you, other Council members or Council staff have any questions, please feel free to call me at (860) 424-4110.

Respectfully yours,



Frederick L. Riese
Senior Environmental Analyst

cc: Commissioner Gina McCarthy