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Department of Environmental Conservation
Air Pollution Control Division
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AGENCY OF NATURAL RESOURCES

MEMORANDUM

TO: A2 File: Beaver Wood Energy Fair Haven LLC

THRU: Doug Elliott, Engineering Services Section Chief
Engineering Services Section, Air Quality & Climate Division

FROM: Martin Gildea, Environmental Engineer
Engineering Services Section, Air Quality & Climate Division

DATE: February 02, 2015

SUBJECT: Extension of Expiration Date of Air Pollution Control Permit to Construct #AP-11-015a

On January 8, 2015 the Vermont Agency of Natural Resources, Air Quality & Climate Division received a request from Beaver Wood Energy Fair Haven, LLC (BWE) for a second extension to their original air pollution control permit to construct #AP-11-015 issued February 10, 2012. The first extension (#AP-11-015a) was issued on August 5, 2013 and is scheduled to expire on February 10, 2015. Since construction has not, and will not commence by the expiration date, BWE requested an additional 18-month extension to allow them additional time to procure a Power Purchase Agreement (PPA) in the time allocated in the development funding plan.

Prior to submitting the extension request, Power Engineers, Inc., BWE's agent for the extension request, and the Agency discussed what type of information would be necessary for the Agency to complete its review for considering extending the term of the permit.

The Agency directed Power Engineers to include the following information in the extension request:

- BWE will need to provide their reason(s) why an extension is justified, and include the status of the project and the new projected schedule.
- BWE must demonstrate that the BACT limits in the current permit still represent state-of-the-art BACT. If BACT for a given pollutant has changed since the issuance of the permit, then BWE must explain how they will comply with the new BACT.
- BWE must address whether any new National Ambient Air Quality Standards have come into effect since the submission of the permit application on 2/22/2011, and, as necessary, demonstrate that the proposed project will be in compliance with the new NAAQS.
- BWE must address any new regulatory requirements that apply to the proposed project and how BWE will comply with these new standards.

The Agency also indicated that the maximum period of time for an extension of the expiration date is limited to 18 months. If additional time is needed beyond 18 months, then another extension request would be needed.



The extension request submitted by BWE on January 08, 2015 included all the requested information. The following is my critique of their submittal.

BWE will need to provide their reason(s) why an extension is justified, and include the status of the project and the new projected schedule.

In BWE's extension request they have indicated they still are planning on developing the project but have been delayed in negotiating a power purchase agreement (PPA). To date they have been trying to secure a PPA through the SPEED program and/or other Vermont utilities. They are continuing to try and negotiate a PPA with Vermont's largest utility (Green Mountain Power), and are also in discussions with other New England Utilities. They expect to be able to start construction within six to twelve months of finalizing their PPA.

While the specifics of their explanation are limited, it is our understanding that a PPA is a key component to be able to draw the interest of investors. It should be noted that BWE has not returned to actively pursuing a Certificate of Public Good from the PSB, so this process could also further delay construction.

For the purposes of this extension of permit AP-11-015a, their description of the status of the project is sufficient.

BWE must demonstrate that the BACT limits in the current permit still represent state-of-the-art BACT. If BACT for a given pollutant has changed since the issuance of the permit, then BWE must explain how they will comply with the new BACT

Boiler:

BWE's review of the MSER (BACT) determinations at other, similar facilities included using the EPA's RACT/BACT/LAER Clearinghouse database, and they also followed up on some of the sources identified in the original MSER analysis.

Since the issuance of the BWE permit there has been limited permitting activity for similar facilities. Noted exceptions follow.

During the initial review of the BWE permit, there were two proposed wood-to-energy projects in Massachusetts that had NOx and CO limits lower than BWE: Palmer Renewable Energy and Pioneer Renewable Energy. Construction has not commenced on the Palmer Renewable Energy project; the MA DEP Plan Approval (equivalent to VT's Air Pollution Control Construction Permit) was issued in June 2011 and is currently going through its second appeal in the Massachusetts court system. In September 2010 the Pioneer Renewable Energy projected requested the MA DEP to put their permit application on hold. As a result, the MA DEP has not issued a Plan Approval for this project. The Agency still considers the proposed lower NOx and CO limits for these two facilities to not represent BACT for BWE in part since these emission rates have not been demonstrated.

In their review of BACT for PM, BWE noted that Warren County Biomass (Georgia) and Klamath Falls Biomass (Oregon) were both issued permits with a total PM limit of 0.018 lb/MMBtu (lower than the 0.019 lb/MMBtu for BWE). The applicants for both of these projects have decided to stop their efforts to develop the projects. The Agency does not consider these projects to represent BACT for total PM.

Seneca Sustainable Energy (Oregon) is up and running and this project has been learning about issues with the EPA test methods and Oregon Department of Environmental Quality's test methods for total PM. This facility has a total PM limit of 0.008 lb/MMBtu. Due to the presence of SO₂, NO_x, and NH₃ in the exhaust, it appears that EPA Method 5/202 for and ODEQ Method 5 create ammonia sulfate and possibly ammonia nitrate compounds that become recorded as PM, and the total PM emission rate documented from these methods exceed their permit limit. To help demonstrate the interaction of ammonia in the

exhaust gas with SO₂ and NO_x, SSE operated their boiler without using ammonia injection for NO_x control: operating in this manner demonstrated a total PM emission rate below their 0.008 lb/MMBtu limit. SSE has also used a much more expensive test method: Conditional Test Method 039 (CTM039) that simulates the cooling of the exhaust gas as it leaves the stack and enters the atmosphere. CTM039 shows a much lower level of total PM emissions compared to Method 5/202, and most, but not all of the CTM039 results indicate compliance with the 0.008 lb/MMBtu limit. SSE is now in the process of requesting changes in their air permit to change the PM test frequency, PM test methods, and total PM limit.

The BWE total PM limit of 0.019 lb/MMBtu is based on PM test results using EPA Method 5/202. BWE's permit has a lower emission limit for ammonia than SSE, so BWE should have less interaction between ammonia and SO₂/NO_x in the PM sampling equipment (less formation of artifacts causing a false high PM value). Due to ongoing uncertainty with the effects of artifacts created by the test methods and the proposed changes to the SSE permit, the Agency does not consider SSE's original total PM limit to represent BACT at this time.

BWE also noted in their extension request that there is a new PM control technology that is coming onto the market: ceramic filters. The ceramic filters are used in the same manner that a filter bag is used in a baghouse. One significant difference is that the ceramic filters can be fabricated with embedded catalyst(s) that can be also used to reduce CO and, with the injection of ammonia upstream of the filters, NO_x. This is very promising technology, but at this time there are no installation on large industrial boilers. The use of ceramic filters could be used to meet PM BACT, but at this time the Agency does not consider the ceramic filters' potential lower PM emission rate as setting a new lower BACT for PM.

Wood Pellet Manufacturing:

Since the RBLC had only one wood pellet manufacturing operation listed (International Biofuels in Virginia – project was never built), BWE also contacted state environmental agencies in New England and New York to establish if there are any recently issued permits for pellet manufacturing facilities. BWE also checked the Biomass Magazine's listing of pellet manufacturing facilities.

The Agency is not aware of any pellet manufacturing facilities that have received air permits since the time the BWE permit was issued. Therefore the MSER/BACT analysis for BWE's pellet plant operation remains unchanged.

Hazardous Most Stringent Emission Rate:

BWE also conducted a review of the RBLC and permits from other facilities to identify if there were any sources with more stringent emission rates for ammonia from the wood fired boiler. While some sources had the same ammonia emission rate as BWE, no sources were found with a lower ammonia emission rate. Since the original HMSER determination is valid for 5 years, a review of the ammonia HMSER was not necessary for this extension request.

BWE must address whether any new National Ambient Air Quality Standards have come into effect since the submission of the permit application on 2/22/2011, and, as necessary, demonstrate that the proposed project will be in compliance with the new NAAQS.

On January 15, 2013 the EPA published a final rule for the NAAQS for PM_{2.5}. This new final rule reduced the annual PM_{2.5} standard from 15 µg/m³ to 12 µg/m³. The air dispersion modeling analysis for the original BWE permit indicates that the PM_{2.5} emissions from the proposed project is not expected to cause or contribute to a violation of this new NAAQS.

BWE must address any new regulatory requirements that apply to the proposed project and how BWE will comply with these new standards.

On February 1, 2013, the EPA published a new final rule for 40 *CFR* Part 63 Subpart JJJJJJ - the National Emission Standards for Hazardous Air Pollutant for Area Sources: Industrial, Commercial, and Institutional Boilers. Subpart JJJJJJ was initially issued as a final rule on March 21, 2011 and the Agency had included the applicable requirements into the original BWE permit. Since the EPA had announced its intent to reconsider this rule, the Agency wrote the original BWE permit to refer to sections of Subpart JJJJJJ rather than re-write the Subpart JJJJJJ requirements into the permit. As a result the changes in the new final rule are included in the original permit and no further changes are required.

Based on the available information, it is recommended to reissue the BWE Air Pollution Control Permit to Construct (AP-11-015a) permit with an extension of 18 months. The expiration date for the new permit will be August 02, 2016. The new permit will be given a new permit number: AP-11-015b.