August 5, 2011

John Guth, Regional Air Quality Program Manager
Department of Environmental Protection
230 Chestnut Street
Meadville, PA 16335

Re: Crawford Renewable Energy, No. 20-305A

Dear Mr. Guth:

This letter provides the comments of Citizens for Pennsylvania's Future (PennFuture) and Group Against Smog and Pollution (GASP) on the proposed plan approval for the new Crawford Renewable Energy, LLC tire-derived fuel power generation plant in Greenwood Township, Crawford County (CRE). This proposal, No. 20-305A, was published in the Pennsylvania Bulletin on June 25, 2011.[1]

PennFuture is a statewide, public interest, membership organization, whose purposes include advocating and litigating on behalf of the environment and public health, air quality, and water quality in Pennsylvania. GASP is a Pittsburgh-based nonprofit environmental organization that has focused on improving regional air quality since its founding in 1969.

The proposed CRE plan approval represents the first time that the Department has evaluated control technology for greenhouse gases (GHGs). Under state law, the Department must determine both Best Available Control Technology (BACT) and Best Available Technology (BAT) for GHGs. Because this is an issue of first impression, the Department must thoroughly research and evaluate its options and apply technology that will set Pennsylvania on the right track to addressing the emission of greenhouse gases by major sources located in the Commonwealth.

I. Climate Change

The United States Environmental Protection Agency (EPA) has found that "greenhouse gases in the atmosphere may reasonably be anticipated both to endanger the public health and to endanger the public welfare of current and future generations".[2] EPA's endangerment finding relies on many observed and projected effects of climate change, including adverse air quality impacts; increased risk of wildfires, flooding, and drought; adverse impacts from sea level rise and more intense storms on coastal areas; and threats to energy, transportation, and water

[1] 45 Pa.B. 3212.
[2] Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act; Final Rule (Final Endangerment Finding), 74 Fed. Reg. 66,496, 66,516 (Dec. 15, 2009).

resource infrastructure.[3] In Pennsylvania, the Department's Climate Impact Assessment (Assessment) has also identified severe expected effects from climate change.[4]

EPA has found that "carbon dioxide is expected to remain the dominant anthropogenic greenhouse gas, and thus driver of climate change, over the course of the 21st century."[5] The Department's Assessment affirms the central role of carbon dioxide in climate change:

> As with other regions of the world, Pennsylvania's climate will change over the course of the next century and beyond in response to the substantial increase in atmospheric concentrations of carbon dioxide and other greenhouse gases that followed the development of the world's economy since the mid 1700s.[6]

By itself, Pennsylvania is responsible for 1% of carbon dioxide emissions in the world.[7] With its determination of GHG control technology for CRE, the Department has the opportunity to begin to reduce the Commonwealth's carbon dioxide emissions and its contribution to global climate change.

II. Applicable Technology Requirements

A. Best Available Control Technology

Prevention of Significant Deterioration (PSD) air permitting requirements apply to emissions from new and modified sources of air pollution in areas that do not exceed National Ambient Air Quality Standards. Pennsylvania regulations incorporate by reference federal standards.[8] When applicable, PSD requires that sources meet BACT, defined under the Clean Air Act as follows:

> …[A]n emission limitation based on the maximum degree of reduction of each pollutant subject to regulation under this Act emitted from or which results from any major emitting facility, which the permitting authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such facility through application of production processes and available methods, systems, and techniques, including fuel cleaning, clean fuels, or treatment or innovative fuel combustion techniques for control of each such pollutant.[9]

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[3] Id. at 66,497-99.
[4] Pennsylvania DEP, "Pennsylvania Climate Impact Assessment" at 6-14 (2009), prepared by the Environment and Natural Resources Institute, the Pennsylvania State University, available at http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-75375/7000-BK-DEP4252.pdf (last visited Aug. 5, 2011). See also Pennsylvania DEP, "Pennsylvania Climate Change Action Plan" (2009), Chapter 2, available at http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-77736/ALL%20OF%20VOLUME%201%20AND%202.pdf (last visited Aug. 5, 2011).
[5] Final Endangerment Finding at 66,519.
[6] Assessment at 19.
[7] Union of Concerned Scientists, "Climate Change in Pennsylvania: Impacts and Solutions for the Keystone State" (October 2008) at 6.
[8] 25 Pa. Code § 127.83.
[9] 42 U.S.C. § 7479 (see also 25 Pa. Code § 121.1).

BACT sets a "high threshold" which requires a "careful and detailed look" at a facility's proposed technology.[10] The BACT standard is a cornerstone of progress toward pollution reduction and protection of the public health.

Under EPA's Tailoring Rule, GHGs are now subject to regulation under the Clean Air Act and Pennsylvania's Air Pollution Control Act and air pollution regulations.[11] EPA has issued a "PSD and Title V Permitting Guidance for Greenhouse Gases" (GHG PSD Guidance) to assist permit applicants and permit writers in addressing permit requirements applicable as of January 2, 2011 under the Tailoring Rule.[12] EPA has also issued GHG Control Measures White Papers for several industrial sectors.[13]

B. Best Available Technology

Under Pennsylvania law, applications for plan approval must show that the emissions from a new source will be the minimum attainable through the use of BAT.[14] BAT means "[e]quipment, devices, methods or techniques as determined by the Department which will prevent, reduce or control emissions of air contaminants to the maximum degree possible and which are available or may be made available."[15]

III. Technology Options for Greenhouse Gases

The PSD GHG Guidance addresses control technology options for consideration in a BACT analysis. Chapter III of the Guidance specifically addresses BACT, including EPA's five-step, top-down process as it relates to GHGs. The GHG control options addressed include two general options for power generating facilities (energy efficiency and carbon capture and storage) as well as several other options specific to certain types of sources.

Under the PSD GHG Guidance, an applicant may evaluate and propose to apply "innovative technologies" that qualify for coverage under the innovative control technology waiver in the EPA rules.[16] Under the waiver, a source is allowed an extended period of time to bring innovative technology into compliance with the required performance level.[17] With some GHG control options now in development, such an extension may present an opportunity for a permitting authority to create a reasonable schedule for such controls.

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[10] *In re: Northern Michigan University, Ripley Heating Plant*, PSD Appeal No. 08-02, slip op. at 12 (Env. Appeals Board, Feb. 18, 2009) and cases cited therein.
[11] Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule, 75 Fed. Reg. 31,514 (June 3, 2010).
[12] Available at http://www.epa.gov/nsr/ghgdocs/ghgpermittingguidance.pdf (last visited Aug. 5, 2011).
[13] Available at http://www.epa.gov/nsr/ghgpermitting.html (last visited Aug. 5, 2011).
[14] 25 Pa. Code § 127.12(a)(5).
[15] 25 Pa. Code § 121.1.
[16] PSD GHG Guidance at 28, citing 40 CFR 52.21(v); 40 CFR 51.166(s).
[17] PSD GHG Guidance at 28.

A. Efficiency

The PSD GHG Guidance emphasizes that techniques to increase energy efficiency are a key GHG-reducing opportunity. Energy efficient technologies translate into fewer overall emissions of all air pollutants per unit of energy produced. Generally, examples of energy efficiency improvement of a primary energy producing boiler are:

- supercritical steam rather than subcritical steam;
- combined cycle turbines rather than simple cycle turbines. [18]

Examples of energy efficiency related to projects on a greenfield site are:

- using the thermal energy and electricity that is generated on site; and
- optimizing the design, operation, and maintenance of the steam distribution system to require less demand. [19]

For a new facility, EPA recommends that the BACT analysis concentrate on efficiency of equipment that uses the largest amounts of energy (i.e., induced draft fans, electric water pumps, etc.).[20]

B. Carbon Capture and Storage

Carbon capture and storage (CCS) involves separation and capture of CO_2 from the flue gas, pressurization of the captured CO_2, transportation of the CO_2 via pipeline, and finally injection and permanent geologic storage of the captured CO_2. Specific processes include the following:

- Pre-combustion systems;
- Post-combustion systems;
- Oxy-fuel combustion;
- Sequestration; and
- Bio-sequestration.

Several different technologies, at varying stages of development, have the potential to separate and capture CO_2. Some have been demonstrated at the slip-stream or pilot-scale, while many others are still at the bench-top or laboratory stage of development. The PSD GHG Guidance classifies CCS as an add-on pollution control technology that is available for large CO_2 emitting facilities, such as fossil fuel-fired power plants.[21] EPA expects that CCS should be listed as a control option in Step 1 of the BACT analysis for GHG.

[18] Id. at 29.
[19] Id. at 30-31.
[20] Id. at 31.
[21] Id. at 32.

C. Clean Fuels

The Clean Air Act definition of BACT, above, includes "clean fuels". EPA has recognized that this requirement will not usually be applied to fundamentally redefine a source by requiring the permit applicant to switch its primary fuel at the source.[22] However, EPA notes that "a permitting authority retains the discretion to conduct a broader BACT analysis and to consider changes in the primary fuel", and to require consideration of greater use of a fuel that the applicant is already proposing to use in some aspect of the project design.[23]

IV. CRE GHG BACT Submission

In response to a request from the Department dated December 10, 2011, CRE submitted Addendum A to its Control Technology Evaluation, Section 5 of the plan approval application (Addendum A). CRE's submission reviewed emissions of GHGs at the proposed plant, discussed possible controls, and proposed BACT.[24]

V. Department Review of GHG BACT

This plan approval application is the first ever submitted in Pennsylvania that requires the Department to conduct a technology review for GHGs. It is critical that the Department establish a rigorous approach to this review that will set an aggressive standard for future technology reviews. The national effort to reduce greenhouse gases and address climate change depends on sound permitting decisions at the state level, and in Pennsylvania, this effort starts with CRE.

The Department's review of the Tailoring Rule as applied at CRE acknowledges that the facility is subject to 40 C.F.R. 51 and 52 (Review Memo at 20). The Department summarized "the BACT determination" by noting the following potential control technologies:

- CFB Combustion
- Carbon Capture & Storage
- Energy Efficiency utilization[25]

The Department then lists CFB Combustion and Energy Efficiency utilization as technically feasible control technologies. With no discussion, in the next sentence, the Department states: "The use of CFB technology, utilization of TDF (biomass of ~20%), and utilization of energy efficient components & equipment represent BACT for the facility." Also with no analysis, the Department then lists GHG emission rates for CRE.

This Department's GHG BACT evaluation is deficient in many ways. First, the Department failed to conduct an independent evaluation of plant emissions of GHGs. CRE estimates emissions of CO2 at the plant at over 800,000 tons per year (Addendum A at 3), a high emissions level that requires independent evaluation by the Department. Further, CRE's

[22] Id. at 27.
[23] Id. at 28.
[24] Addendum A.
[25] Review Memo at 20.

estimate of emissions of nitrous oxide, a GHG with a global warmng potential over 100 years that is 310 times as high as carbon dioxide[26] and that can be formed in high amounts in circulating fluidized bed boilers like the ones proposed for CRE, relies on a single unnamed overseas study.[27] The Department must investigate GHG emissions levels at CRE for itself.

Second, the Department makes no independent effort to identify control technologies. For those control technologies presented by CRE, the Department undertakes no independent review. Further, the Department does not offer any of its own research about what technology might be available in the fast-developing field of GHG controls. The Department does not conduct (Review Memo at 20) even a cursory "top-down" analysis[28] that would include the following steps required by standard BACT operating procedure:

- Identify all control technologies: with none of its own research presented in the Review Memo, the Department appears to rely entirely on CRE to identify these technologies. The Department must conduct its own investigation to determinate what control technologies are available.

- Eliminate technically infeasible options: since it did not research control technology, the Department has no way of knowing which options should be brought forward and which should be eliminated. Further, the Department conducted no analysis of technology eliminated by CRE to determine whether such elimination was appropriate.

- Rank remaining control technologies by control effectiveness: Again, the Department cannot rank what it has not investigated. Even as to the controls presented by CRE, the Department did no evaluation. So, for the two control technologies found to be feasible (CFB Combustion and Energy Efficiency utilization), the Department offers no evidence that these technologies are being implemented in a manner consistent with BACT.

- Evaluate the most effective controls and document results: the Department's Review Memo evaluates no controls, and therefore has no results to document.

- Select BACT: The Department has done nothing more than ratify the BACT proposal offered by CRE. The Department has copied the emission rates proposed by CRE[29] and offers no independent evaluation of whether they are accurate or should be reduced.

Third, the Department references none of the guidance and other literature available to support its investigation and determination of GHG BACT, such as the GHG PSD Guidance from EPA.

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[26] EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks, 1990-2009 at 1-7, available at http://www.epa.gov/climatechange/emissions/downloads11/US-GHG-Inventory-2011-Chapter-1-Introduction.pdf (last visited Aug. 5, 2011).
[27] Addendum A at 3.
[28] EPA, New Source Review Workship Manual, Draft, October 1990, Part I, Chapter B, available at http://www.epa.gov/ttn/nsr/gen/wkshpman.pdf (last visited Aug. 5, 2011).
[29] Compare Addendum A at 8-9 with Review Memo at 20.

In sum, the Department has abdicated its role as the finder of BACT at the very moment when it is undertaking a critical responsibility to determine GHG controls required under the law. The CRE proposal is not an ordinary plan approval. Rather, it is the first in Pennsylvania, and is part of the first wave nationally. The Department must not fail to investigate available technologies, and must require that high standards of BACT are enforced.

VI. Best Available Technology

The Department's Review Memo references the Pennsylvania BAT standard. However, the Department offers no analysis or even any further discussion about BAT before concluding that "This application shows that this facility will meet the applicable requirements" of, among other things, BAT.[30] As with BACT, the Department conducts no investigation of BAT options and offers no independent basis for its conclusion.

VII. Conclusion

The Department's proposed plan approval is wholly unsupported by any investigation or analysis as to BACT or BAT. The Department must withdraw the proposed plan approval and conduct such an investigation and analysis before re-proposing the plan approval for public review and comment.

Sincerely,

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[30] Review Memo at 29-30.
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