



RICK SNYDER  
GOVERNOR

STATE OF MICHIGAN  
DEPARTMENT OF ENVIRONMENTAL QUALITY  
LANSING



DAN WYANT  
DIRECTOR

November 17, 2011

Ms. Genevieve Damico  
Chief, Air Permits Section  
United States Environmental Protection Agency, Region 5  
77 West Jackson Boulevard  
Chicago, Illinois 60604-3590

Dear Ms. Damico:

Thank you for your interest regarding the Permit to Install application submitted to the Michigan Department of Environmental Quality (MDEQ) by Wolverine Power Supply Cooperative, Inc. for the Sumpter Power Plant. This application is requesting the modification of an existing natural gas-fired combustion turbine to a combined-cycle operation and the installation of a new mechanical draft cooling tower and diesel fuel-fired reciprocating internal combustion engine. The Sumpter Power Plant is located at 8509 Rawsonville Road, Belleville, Michigan. This application is subject to the federal Prevention of Significant Deterioration (PSD) regulations.

Pursuant to state and federal requirements, the MDEQ held a public comment period that ended on November 14, 2011, on its proposed conditional approval of the permit. No public hearing was requested nor held. The Air Quality Division (AQD) received one written comment during the public comment period.

After careful consideration of the issues and pursuant to the delegation of authority from the Director of the DEQ, I have approved Permit to Install No. 81-11, with no modifications made to the proposed permit. The final Permit Terms and Conditions are available at <http://www.deq.state.mi.us/aps/cwerp.shtml>.

The following comments were submitted during the public comment period:

Comment

1. Under SC I.10 on page 13 of the draft permit, please add the statement to clarify that the CO<sub>2</sub>-equivalent (CO<sub>2</sub>e) emissions limit will account for emissions of carbon dioxide, methane, and nitrous oxide.

AQD Response

For purposes of regulation, the Tailoring Rule defines greenhouse gases (GHGs) as the sum of carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF<sub>6</sub>). The Tailoring Rule also defines and requires the use of Global Warming Potential (GWP) found in Table A-1 of 40 CFR Part 98 (the Mandatory Reporting Rule). Table A-1 can be found on page 56395 of Vol. 74, No. 209 of the Federal Register, October 30, 2009.

Carbon Dioxide Equivalent (CO<sub>2</sub>e) aggregates total GHG emissions to a single metric. When quantities of the different GHGs are multiplied by their GWPs, the different GHGs can be summed and compared on a CO<sub>2</sub>e basis. As stated in the draft permit's Fact Sheet, "Efficient combustion of natural gas results in conversion of almost all the fuel to CO<sub>2</sub>, with only trace

amounts of CH<sub>4</sub> and N<sub>2</sub>O.” All GHG emissions that result from the combustion of natural gas are aggregated in the CO<sub>2</sub>e emissions limit which by definition accounts for the emissions of CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O.

Since CO<sub>2</sub>e is defined in the applicable regulations, adding a statement that “the CO<sub>2</sub>-equivalent (CO<sub>2</sub>e) emissions limit will account for emissions of carbon dioxide, methane, and nitrous oxide” is unnecessary and could be misinterpreted.

#### Comment

2. The GHG best available control technology analysis in the draft permit’s Fact Sheet has a discussion of carbon capture and sequestration (CCS). On page 15 of the Fact Sheet, there is a statement that says CCS was eliminated because “the cost to generate electricity would make the system no longer competitive.” In order to support this statement, please provide additional justification to substantiate your cost comment.

#### AQD Response

The support for this statement is located in Appendix 6, Section 4.4.1 Carbon Capture and Sequestration of the permit application. As stated in the permit application:

##### **Section 4.4.1 Carbon Capture and Sequestration**

As noted earlier, at this time, the Applicant does not believe that CCS is technically feasible; however, it was carried forward to Step 4 of this analysis. At this point, CCS is evaluated for economic, energy, or environmental impacts. Regarding economic impacts, in its PSD BACT guidance, the USEPA states:

EPA recognizes that at present CCS is an expensive technology, largely because of the costs associated with CO<sub>2</sub> capture and compression, and these costs will generally make the price of electricity from power plants with CCS uncompetitive compared to Electricity from Plants with other GHG controls. Even if not eliminated in Step 2 of the BACT analysis, on the basis of the current costs of CCS, we expect that CCS will often be eliminated from consideration in Step 4 of the BACT analysis, even in some cases where underground storage of the captured CO<sub>2</sub> near the power plant is feasible. However, there may be cases at present where the economics of CCS are more favorable (for example, where the captured CO<sub>2</sub> could be readily sold for enhanced oil recovery) making CCS a more viable option under Step 4. (USEPA 2010b).

The legal and long-term liability issues associated with carbon sequestration make this an uncertain and consequently impossible option for a natural gas-fired combustion turbine. The uncertainty means that no vendor could guarantee performance or commercial financing be available. In addition to the cost of CO<sub>2</sub> capture, CCS involves geologic or terrestrial sequestration or conversion of the CO<sub>2</sub> into long-term storage. The costs associated with sequestration are very site-specific and can involve substantial costs for items such as pipeline construction, pumping, drilling and well construction, and monitoring. Due to these limitations, quantitative cost analyses were determined to be both impractical and unreliable for this analysis and were not performed.

Based on the USEPA’s current position relative to the economic viability of CCS applied to a commercial power plant, this alternative is determined to be not cost effective for CO<sub>2</sub> control from the proposed Project, and has been eliminated from further consideration.

The DEQ concurs with this analysis which is summarized in the draft permit's Fact Sheet as follows:

The costs associated with sequestration are very site-specific, and can involve substantial costs for pipelines, pumping, drilling and monitoring. Also, for a project involving an existing natural gas-fired combustion turbine the **range of scale** does not make CCS and terrestrial sequestration a feasible option as the cost to generate electricity would make the system no longer competitive. Due to the cost and uncertainty associated with these technologies, these options were eliminated from further consideration for this project. (*emphasis added*)

Thank you for your input regarding our review of this permit application. If you have any questions, please contact Ms. Julie Brunner, AQD, at 517-373-7088, or you may contact me.

Sincerely,

Mary Ann Dolehanty, Permit Section Supervisor  
Air Quality Division  
517-373-2098

cc: Mr. Johnny Vawters, Sumpter Township Supervisor  
Mayor Eddie Francis, City of Windsor  
Ms. Cathy Garrett, Wayne County Clerk  
Ms. Laurel Broten, Minister, Ontario Ministry of the Environment  
Mr. Mike Moroney, Ministry of the Environment, Sarnia/Windsor District  
Mr. Doug McDougall, Ministry of the Environment, Windsor Area Office  
Ms. Karen Clark, Ministry of the Environment, Air Policy and Climate Change Branch  
Mr. John F. McDonald, International Joint Commission  
Ms. Averil Parent, City of Windsor  
Ms. Madeleine Godwin, Ontario Ministry of the Environment, Windsor  
Ms. Pamela Blakley, U.S. Environmental Protection Agency, Region V  
Mr. Constantine Blathras, U.S. Environmental Protection Agency, Region V  
Mr. Mike Ahern, Ohio Environmental Protection Agency  
Mr. Chris Manzon, Pollution Control Services, City of Windsor  
Mr. Butler Benton, Wayne County Department of the Environment  
Mr. Brad Wurfel, MDEQ  
Ms. Wilhemina McLemore, MDEQ