

STATE OF MICHIGAN
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PUBLIC PARTICIPATION DOCUMENTS

For

WOLVERINE POWER SUPPLY COOPERATIVE, INC.
Rogers City Michigan

PERMIT APPLICATION NUMBER

317-07

August 18, 2009

FACT SHEET

August 18, 2009

Purpose and Summary

The Michigan Department of Environmental Quality (MDEQ), Air Quality Division (AQD), is proposing to act on Permit to Install (PTI) application No. 317-07 submitted by Wolverine Power Supply Cooperative, Inc. (Wolverine) for their Wolverine Clean Energy Venture (WCEV). The application is for the proposed installation and operation of a 600 megawatt (MW) (net) solid fuel-fired power plant, which is to be located in the existing Carmeuse quarry (formerly Oglebay Norton) property, directly south of Rogers City, Michigan.

Consistent with the U.S. Environmental Protection Agency (USEPA) and MDEQ guidance, the PTI application, 317-07, submitted on September 26, 2007, originally addressed Best Available Control Technology (BACT), National Ambient Air Quality Standards (NAAQS), and Increment requirements under the Prevention of Significant Deterioration (PSD) program for particulate matter with an aerodynamic particle size smaller than 10 micrometers (PM10) and PM10 as a surrogate for particulate matter with an aerodynamic particle size smaller than 2.5 micrometers (PM2.5). The MDEQ documented on July 14, 2008, that the permit application for the project was "administratively complete" with respect to those requirements.

On July 15, 2008, the USEPA promulgated regulations to implement certain provisions of the Clean Air Act's PSD program for PM2.5, including the major source threshold and significant emissions rate. The regulations provide that a state with a USEPA-approved implementation plan (SIP) for the PSD program has three years to amend its state regulations to incorporate the rule changes and submit a revised SIP. During the three-year period, "SIP-approved" states are authorized to implement a PM10 program as a surrogate to meet the PSD program requirements for PM2.5. USEPA approved Michigan's SIP for the PSD program on September 16, 2008. Michigan has not yet submitted a revised SIP to USEPA to incorporate the rule changes.

In addition, USEPA has proposed other elements for the PSD program for PM2.5 including PM2.5 increments. The USEPA has not promulgated a final rule regarding those provisions.

Although not required by federal or state law, Wolverine has requested that the MDEQ, rather than use PM10 as a surrogate for PM2.5, include an emission limit in the permit that reflects the best available control technology (BACT) for PM2.5. Wolverine submitted a "top-down" BACT analysis for PM2.5 emissions. It also submitted an air quality analysis that includes a modeling demonstration showing that emissions from the proposed facility will not exceed the NAAQS for PM2.5. The air quality analysis further demonstrates that PM2.5 emissions will not exceed the increments in USEPA's proposed rule. Wolverine is proposing to voluntarily accept in PTI No. 317-07, if issued, additional legally enforceable permit conditions and emission limitations for PM2.5.

Prior to acting on this application, the AQD is holding a 30-day public comment period and a public hearing, to allow all interested parties the opportunity to comment on the proposed BACT emission limits and air quality analysis for PM2.5. All relevant information received during the comment period and hearing will be considered by the decision-maker prior to taking final action on the application.

Background Information

Wolverine is a not-for-profit, member-owned generation and transmission electric cooperative headquartered in Cadillac, Michigan. Wolverine's four transmission member cooperatives serve homes and businesses in rural portions of 35 counties primarily in northern and western Michigan.

The new facility proposed by Wolverine will be comprised of two 300 MW (net) circulating fluidized bed (CFB) boilers; an auxiliary boiler; a black start turbine generator; an emergency engine generator; an engine fire pump; cooling towers; fuel, limestone, lime, activated carbon, and ash receiving operations; handling and storage equipment; and other ancillary equipment for boiler start-up and plant safety.

Wolverine has stated that the selection of the Rogers City area, and the Carmeuse quarry in particular, was primarily based on the desire to minimize disruption to green space property (the facility requires 1,124 acres plus easements); the space available within the Carmeuse quarry; the distances to nearby residences and structures; the availability of high quality limestone from the Carmeuse quarry for emission controls; the availability to receive fuel by ship at the Carmeuse port; and the availability of an acceptable nearby transmission line connection.

This area is currently in compliance with NAAQS for all criteria pollutants, which include sulfur dioxide (SO₂), oxides of nitrogen (NO_x), carbon monoxide (CO), PM₁₀, PM_{2.5}, ozone, and lead.

On October 1, 2008, an informational session was held in the Rogers City High School Gymnasium, 1033 West Huron Avenue, Rogers City, Michigan. During the session, staff provided information and answered questions about the proposed installation and operation of a 600 megawatt coal-fired steam electric power plant.

Three (3) public hearings were held on October 29 and 30, 2008, and January 6, 2009, with formal testimony taken for the proposed project relating to permitting requirements of the MDEQ Rules for Air Pollution Control (Rules), the PSD regulations, federal New Source Performance Standards (NSPS), National Emission Standards for Hazardous Air Pollutants (NESHAP), and a case-by-case Maximum Achievable Control Technology (MACT) determination which establishes federally enforceable MACT emission limitations and requirements pursuant to Rule 336.1299(2)(b) promulgated pursuant to Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, for implementing Section 112(g) of the federal Clean Air Act.

The purpose of this public comment period and hearing is to take comments and formal testimony on the proposed BACT emission limits and the air quality analysis for PM_{2.5} at the facility.

Key Permit Review Issues

- **PSD Regulations** – The project is subject to review under the PSD regulations which require BACT, a source impact analysis, an air quality impact analysis, and an additional impact analysis for each regulated air pollutant for which the project will result in significant emissions. Potential sources of PM_{2.5} at the proposed WCEV facility include the CFB boilers, material handling operations, auxiliary boiler, emergency firewater pump engine and emergency generator, black start generator and cooling towers.

- **PM2.5 BACT Analysis** - PM2.5 emissions consists of two components: condensable and filterable. The condensable portion consist of organic compounds, acid gasses, ammonia and ammonium salts. The filterable portion consist of fine particulate matter.

- **CFB Boilers**

There were no entries of PM2.5 limits for solid fuel fired boilers in the USEPA RACT/BACT/LAER Clearinghouse to compare against. Therefore, PM2.5 emissions were conservatively estimated by assuming that all of the condensable PM10 emissions emitted from a well controlled CFB boiler will be PM2.5.

Wolverine's analysis explained that condensable emissions will be mostly controlled by the polishing scrubber proposed for flue gas desulphurization of the CFB boilers. However, the CFB technology, limestone injection, pulse jet fabric filter and Good Combustion Control (GCC) will also aide in reduction of these emissions. The AQD concurs with this analysis, since these controls were reviewed in the previous BACT and MACT analyses for the CFB boilers and found to have an expected control efficiency of 95% for acid gases. Additional control technologies were evaluated, however they were found to be infeasible or cost prohibitive.

PM2.5 filterable emissions can contain varying concentrations of metal HAPs, as reviewed in the previous MACT analysis. Subbituminous coal, bituminous coal, and petroleum coke all contain varying concentrations of metal HAPs, such as mercury, and are emitted by combustion processes mainly in the form of particulate. Wolverine proposed the use of fiberglass or polyphenylene sulfide (PPS) felt bags in the pulse jet fabric filter. The AQD agrees that these types of bags have been certified by USEPA to effectively remove fine particulate matter and provide adequate cake formation for additional gas/solids contact to enhance the removal of acid gases and particulate matter consisting of metal Hazardous Air Pollutants (HAPs).

- **Material Handling Operations** – PM2.5 condensable emissions are primarily formed from the combustion of fuels. Therefore, the emissions of PM2.5 will be in the form of filterable particulate for the material handling sources. The AQD concurs with Wolverine's analysis, which has proposed BACT for PM/PM10 emissions from material handling operations to also represent BACT for PM2.5 filterable emissions. A combination of fabric filters, wet suppression equipment, and partial enclosures will be required.
- **Auxiliary Boiler, Emergency Firewater Pump Engine, Emergency Generator, and Black start Generator** – Potential particulate matter, of all forms, from the distillate oil-fired equipment is expected to be very low, since the equipment will have limited use. The AQD concurs with Wolverine's analysis, which proposes that there is no economical means of controlling emissions of PM2.5 from these sources and BACT will be the same as for PM/PM10 and SO₂, which is the use of clean low-sulfur fuel (0.5%) and GCC.

- **Cooling Towers** – In the same manner as cooling towers are potential sources of PM10 emissions, cooling tower drift may contain fine particulate matter. Wolverine proposed drift eliminators as the top level of particulate control for a cooling tower. AQD concurs that drift eliminators are recognized as the top level of control for PM2.5, also.
- **Criteria Pollutants Modeling Analysis** - In response to the AQD's recommendation that Wolverine provide a full PM2.5 modeling analysis to demonstrate compliance with proposed thresholds, a complete modeling analysis was submitted by Wolverine (July 29, 2009). The analysis has been reviewed by the the AQD . Due to the lengthy duration of the particulate modeling runs, the receptor grid was split into two equal parts to reduce computational times by allowing multiple runs simultaneously over several computers. For project continuity, AQD maintained the same file and grid structure as submitted by Wolverine. Similar to previous criteria pollutant runs, WCEV and other non-quarry offsite emissions were reviewed in one set of model runs while the impacts from quarry-only emissions were provided in a separate run. The rationale for the split runs was to prevent the quarry from impacting its own non-ambient air space which is considered ambient relative to WCEV and other non-quarry offsite emissions.
- **NAAQS:** Wolverine resubmitted their PM2.5 NAAQS analysis which had been previously provided in their September 20, 2008 submittal. The only modification to that submittal was the clarification of the PM2.5 emissions from the CFB's. AQD had modified Wolverine's submitted CFB emissions to reflect the largest mass emissions during normal operations in conjunction with the lowest airflow rate from the startup/shutdown operations. This scenario provided overly conservative results. Wolverine demonstrated that this emissions/flow rate combination is not possible, therefore the modeling scenario was corrected back to the original specifications to reflect the proper airflow rate with the worst case mass emissions. Modeling results yielded a maximum 24-hour impact of 9.4637 ug/m3. Adding the background concentration of 22 ug/m3, as determined by the 2006 – 2008 monitoring network, the overall NAAQS impact was 31.46370 ug/m3, compared to the NAAQS threshold of 35 ug/m3 (89.9% of threshold). For the annual impact, a maximum impact of 2.89327 ug/m3 was predicted. Adding the 2006-2009 annual background concentration of 7.9 ug/m3, the overall maximum NAAQS impact was determined to be 10.79327 ug/m3, as compared to the annual NAAQS threshold of 15 ug/m3 (72.0% of threshold).
- **PSD Increment:** Wolverine also submitted ambient air impacts to compare against proposed PM2.5 Increment thresholds. AQD recommended that the impacts be compared to the most stringent of the USEPA proposed thresholds (i.e. 9 ug/m3 for 24-hour; and 4 ug/m3 for annual). All WCEV and non-quarry offsite facilities maintained similar emission factors as was used in the NAAQS analysis. Quarry records show that production levels at time of the PSD baseline were greater than current quarry production plus the proposed production increase as a result of WCEV operations. Therefore, quarry production emissions are not considered to consume Increment. Only the increased truck traffic

within the quarry, as a result of proposed WCEV product use, was considered to consume Increment. The maximum 24-hour impact was predicted to be 7.75627 ug/m³, as compared to the proposed 24-hour Increment threshold of 9 ug/m³ (86.2% of threshold). For the annual impact a maximum impact of 1.45135 ug/m³, as compared to the proposed annual Increment threshold of 4 ug/m³ (36.3% of threshold).

- **Pre-Construction Monitoring:** Wolverine applied for and received a waiver from preconstruction monitoring. USEPA regulations, specifically 40 CFR 51, Appendix W, Section 8.2.2(c), states that *“If there are no monitors located in the vicinity of the source, a “regional site” may be used to determine background. A “regional site” is one that is located away from the area of interest but is impacted by similar natural and distant man-made sources.”* Representative data are not always determined by which monitor is closest to the subject area. Although not required at the time of Wolverine’s waiver request, PM_{2.5} background data were included in the original supplied data inventory. That data were collected from the Alpena monitor, approximately 45 kilometers southeast of Rogers City. When Wolverine provided notice to the AQD that they intended to provide PM_{2.5} modeling, a more detailed review was conducted to determine the most representative PM_{2.5} background data. It was determined that the Alpena data was likely not the best representative data because that data set was over five years old and from a lower percentage upwind direction. Although further in distance, approximately 140 kilometers, the Missaukee County monitor was determined to be more representative of the Roger City regional background because 1) the data were current; and 2) the monitor was in a predominant upwind direction (southwest). Prior to receiving the waiver, Wolverine made plans to monitor for PM₁₀ and PM_{2.5}. Although the granted waiver ultimately negated the necessity for onsite monitoring, Wolverine still independently installed PM₁₀ and PM_{2.5} monitors. The PM₁₀ monitor ran for six months and the collected data posted to the USEPA network for ambient monitoring data. The PM_{2.5} monitor experienced a host of technical difficulties and was ultimately destroyed by lightning after three months of monitoring and was not continued.

Key Aspects of Draft Permit Conditions

- **Emission Control Device Requirements** – The proposed draft permit includes BACT requirements for PM_{2.5}.
 - **CFB Boilers**
 - PM_{2.5} emissions will be controlled by the CFB technology, limestone injection, a polishing scrubber, pulse jet fabric filter and GCC.
 - Emission limits proposed for the draft permit will be 0.024 lb/MMBtu of PM_{2.5} for each CFB boiler.
 - Special condition added to the draft permit which will require stack testing for PM_{2.5}.

Conclusion

Based on the analyses conducted to date, staff concludes that the proposed project would comply with all applicable federal air quality requirements and with all AQD regulations. Staff also concludes that this project, as proposed, would not violate the federal NAAQS for PM_{2.5} or PM_{2.5} increments as proposed by USEPA. Based on these conclusions, staff has developed draft permit terms and conditions which would ensure that the proposed facility design and operation are enforceable and that sufficient monitoring, recordkeeping, and reporting would be performed by the applicant to determine compliance with these terms and conditions. If the permit application is deemed approvable, the delegated decision maker may determine a need for additional or revised conditions to address issues raised during the public participation process.

If you would like additional information about this proposal, please contact Ms. Melissa Byrnes, AQD, at 517-373-7065.

STATE AIR REGULATIONS

State Rule	Description of State Air Regulations
R 336.1201	Requires an Air Use Permit for new or modified equipment that emits, or could emit, an air pollutant or contaminant. However, there are other rules that allow smaller emission sources to be installed without a permit (see R 336.1279 through R 336.1290 below). R 336.1201 also states that the Department can add conditions to a permit to assure the air laws are met.
R 336.1205	Outlines the permit conditions that are required by the federal Prevention of Significant Deterioration (PSD) Regulations and/or Section 112 of the Clean Air Act. Also, the same types of conditions are added to their permit when a plant is limiting their air emissions to legally avoid these federal requirements. (See the Federal Regulations table for more details on PSD.)
R 336.1224	New or modified equipment that emits toxic air contaminants must use the Best Available Control Technology for toxics (T-BACT). The T-BACT review determines what control technology must be applied to the equipment. A T-BACT review considers energy needs, environmental and economic impacts, and other costs. T-BACT may include a change in the raw materials used, the design of the process, or add-on air pollution control equipment. This rule also includes a list of instances where other regulations apply and T-BACT is not required.
R 336.1225 to R 336.1232	The concentration of each toxic air contaminant present in the outdoor air must be less than specified levels. These levels, called the initial risk screening level (IRSL) for cancer causing air contaminants and the initial threshold screening level (ITSL) for non-cancer causing air contaminants, are health-based standards. Air Quality Division toxicologists develop these standards following the methods in the rules. The standards are designed to protect all humans, including the most sensitive populations such as the young, elderly, and ill.
R 336.1279 to R 336.1290	These rules list equipment to processes that have very low emissions and do not need to get an Air Use permit. However, these sources must meet all requirements identified in the specific rule and other rules that apply.
R 336.1301	Limits how air emissions are allowed to look at the end of a stack. The color and intensity of the color of the emissions is called opacity.
R 336.1331	The particulate emission limits for certain sources are listed. These limits apply to both new and existing equipment.
R 336.1370	Material collected by air pollution control equipment, such as dust, must be disposed of in a manner, which does not cause more air emissions.
R 336.1401 and R 336.1402	Limit the sulfur dioxide emissions from power plants and other fuel burning equipment.
R 336.1601 to R 336.1651	Volatile organic compounds (VOCs) are a group of chemicals found in such things as paint solvents, degreasing materials, and gasoline. VOCs contribute to the formation of smog. The rules set VOC limits or work practice standards for existing equipment. The limits are based upon Reasonably Available Control Technology (RACT). RACT is required for all equipment listed in R 336.1601 through R 336.1651.
R 336.1702	New equipment that emits VOCs is required to install the Best Available Control Technology (BACT). The technology is reviewed on a case-by-case basis. The VOC limits and/or work practice standards set for a particular piece of new equipment cannot be less restrictive than the Reasonably Available Control Technology limits for existing equipment outlined in R 336.1601 through R 336.1651.
R 336.1801	Nitrogen oxide emission limits for larger boilers and stationary internal combustion engines are listed.
R 336.1901	Prohibits the emission of an air contaminant in quantities that cause injurious effects to human health and welfare, or prevent the comfortable enjoyment of life and property. As an example, a violation may be cited if excessive amounts of odor emissions were found to be preventing residents from enjoying outdoor activities.
R 336.1910	Air pollution control equipment must be installed, maintained, and operated properly.

STATE AIR REGULATIONS

State Rule	Description of State Air Regulations
R 336.1911	When requested by the Department, a facility must develop and submit a malfunction abatement plan (MAP). This plan is to prevent, detect, and correct malfunctions and equipment failures.
R 336.1912	A facility is required to notify the Department if a condition arises which causes emissions that exceed the allowable emission rate in a rule and/or permit.
R 336.2001 to R 336.2060	Allow the Department to request that a facility test its emissions and to approve the protocol used for these tests.
R 336.2801 to R 336.2804 Prevention of Significant Deterioration (PSD) Regulations Best Available Control Technology (BACT)	<p>The PSD rules allow the installation and operation of large, new sources and the modification of existing large sources in areas that are meeting the National Ambient Air Quality Standards (NAAQS). The regulations define what is considered a large or significant source, or modification.</p> <p>In order to assure that the area will continue to meet the NAAQS, the permit applicant must demonstrate that it is installing the BACT. By law, BACT must consider the economic, environmental, and energy impacts of each installation on a case-by-case basis. As a result, BACT can be different for similar facilities.</p> <p>In its permit application, the applicant identifies all air pollution control options available, the feasibility of these options, the effectiveness of each option, and why the option proposed represents BACT. As part of its evaluation, the Air Quality Division verifies the applicant's determination and reviews BACT determinations made for similar facilities in Michigan and throughout the nation.</p>
R 336.2901 to R 336.2903 and R 336.2908	<p>Applies to new "major stationary sources" and "major modifications" as defined in R 336.2901. These rules contain the permitting requirements for sources located in nonattainment areas that have the potential to emit large amounts of air pollutants. To help the area meet the NAAQS, the applicant must install equipment that achieves the Lowest Achievable Emission Rate (LAER). LAER is the lowest emission rate required by a federal rule, state rule, or by a previously issued construction permit. The applicant must also provide emission offsets, which means the applicant must remove more pollutants from the air than the proposed equipment will emit. This can be done by reducing emissions at other existing facilities.</p> <p>As part of its evaluation, the AQD verifies that no other similar equipment throughout the nation is required to meet a lower emission rate and verifies that proposed emission offsets are permanent and enforceable.</p>

FEDERAL AIR REGULATIONS

Citation	Description of Federal Air Regulations or Requirements
Section 109 of the Clean Air Act – National Ambient Air Quality Standards (NAAQS)	The United States Environmental Protection Agency has set maximum permissible levels for seven pollutants. These NAAQS are designed to protect the public health of everyone, including the most susceptible individuals, children, the elderly, and those with chronic respiratory ailments. The seven pollutants, called the criteria pollutants, are carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter less than or equal to 10 microns (PM10), particulate matter less than or equal to 2.5 microns (PM2.5), and sulfur dioxide. Portions of Michigan are currently non-attainment for either ozone or PM2.5. Further, in Michigan, State Rules 336.1225 to 336.1232 are used to ensure the public health is protected from other compounds.
40 CFR 52.21 – Prevention of Significant Deterioration (PSD) Regulations Best Available Control Technology (BACT)	<p>The PSD regulations allow the installation and operation of large, new sources and the modification of existing large sources in areas that are meeting the NAAQS. The regulations define what is considered a large or significant source, or modification.</p> <p>In order to assure that the area will continue to meet the NAAQS, the permit applicant must demonstrate that it is installing BACT. By law, BACT must consider the economic, environmental, and energy impacts of each installation on a case-by-case basis. As a result, BACT can be different for similar facilities.</p> <p>In its permit application, the applicant identifies all air pollution control options</p>

FEDERAL AIR REGULATIONS

Citation	Description of Federal Air Regulations or Requirements
	available, the feasibility of these options, the effectiveness of each option, and why the option proposed represents BACT. As part of its evaluation, the Air Quality Division verifies the applicant's determination and reviews BACT determinations made for similar facilities in Michigan and throughout the nation.
<p>40 CFR 60 – New Source Performance Standards (NSPS)</p>	The United States Environmental Protection Agency has set national standards for specific sources of pollutants. These New Source Performance Standards (NSPS) apply to new or modified equipment in a particular industrial category. These NSPS set emission limits or work practice standards for over 60 categories of sources.
<p>Section 112 of the Clean Air Act</p> <p>Maximum Achievable Control Technology (MACT)</p> <p>Section 112g</p>	<p>In the Clean Air Act, Congress listed 189 compounds as Hazardous Air Pollutants (HAPS). For facilities which emit, or could emit, HAPS above a certain level, one of the following two requirements must be met:</p> <ol style="list-style-type: none"> 1) The United States Environmental Protection Agency has established standards for specific types of sources. These Maximum Achievable Control Technology (MACT) standards are based upon the best-demonstrated control technology or practices found in similar sources. 2) For sources where a MACT standard has not been established, the level of control technology required is determined on a case-by-case basis.

Notes:

An "Air Use Permit," sometimes called a "Permit to Install," provides permission to emit air contaminants up to certain specified levels. These levels are set by state and federal law, and are set to protect health and welfare. By staying within the levels set by the permit, a facility is operating lawfully, and public health and air quality are protected.

The Air Quality Division does not have the authority to regulate noise, local zoning, property values, off-site truck traffic, or lighting.

These tables list the most frequently applied state and federal regulations. Not all regulations listed may be applicable in each case. Please refer to the draft permit conditions provided to determine which regulations apply.