

July 17, 2008

James Zakshesky  
Zoning Administrator  
Presque Isle County Department of Building Inspection  
And Zoning Commission  
P.O. Box 110  
Rogers City, MI 49779

SENT BY U.S. MAIL and EMAIL

Re: Special Use Permit #2006-07, Wolverine Power Cooperative, Petroleum Coke

Dear Mr. Zakshesky,

This letter is submitted on behalf of Clean Water Action, the Environmental Law and Policy Center, Michigan Energy Alternatives, Michigan Environmental Council, Michigan Land Use Institute and Sierra Club Michigan Chapter with respect to Special Use Permit #2006-07, issued to the Wolverine Power Cooperative (“Wolverine”). Due to the significant differences between coal and petroleum coke, we respectfully request that the burning of petroleum coke at the facility be considered grounds for revocation under Section 12.10 of the Zoning Ordinance in effect prior to June 15, 2007, or, in the alternative, a “major” site plan amendment under Section 15.5 of the Zoning Ordinance effective June 15, 2007, triggering full review of the amended plan under Section 15.4.

As we wrote in our previous letter of March 2008, we have grave concerns about the facility’s plan to burn petroleum coke – a dirty waste product of oil refining laden with impurities and contaminants. The burning of petroleum coke was not part of the Special Use permit, which was approved for burning coal. Nor is the use of petroleum coke in keeping the Clean Air Act, which requires a source to consider and use “clean fuels” as part of its pollution control strategy. Wolverine itself acknowledges that its proposed limit for harmful sulfur dioxide is set so that the “worst case” fuel can meet the limit<sup>1</sup>, giving Wolverine the flexibility to buy the cheap, dirty fuel. Indeed, the facility is proposing to burn up to 70% petroleum coke on an annual basis.<sup>2</sup> The application includes no other limitation on the use of petroleum coke, such as an hourly rate limit by weight. Without any other use limits or commitments, the facility may burn 100% petroleum coke whenever the price of petroleum coke is low, especially on a short-term basis. The health of Presque Isle County residents and their environment should not be sold out so easily.

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<sup>1</sup> Application at 5-18: “The WCEV is being designed to take advantage of spot market fuel purchase capability... Thus, this control technology evaluation considers levels of SO2 emissions that can be achieved with the worst case (for SO2) design fuel.”

<sup>2</sup> Permit application at p. 1-4 (January 10, 2008 update, available at [www.deq.state.mi.us/aps/downloads/permits/CFPP/2007/317-07/317-07.htm](http://www.deq.state.mi.us/aps/downloads/permits/CFPP/2007/317-07/317-07.htm))

## *Pet Coke is Dirtier Than Coal*

Petroleum coke is not a direct substitute for coal, but a refining waste product that contains higher levels of numerous pollutants, including sulfur, heavy metals, and organic compounds. As such, petroleum coke poses grave concerns for air and water quality, as well as human health.

Sulfur. The sulfur content of petroleum coke can be significantly greater than that of both “Eastern” bituminous and “Western” subbituminous coal. Due to the manner in which pet coke is produced (i.e., in a typical petroleum refinery), and depending on the parent crude oil feedstocks, significant quantities of sulfur compounds can accumulate in petroleum coke. A study submitted by Wolverine shows levels of sulfur in petroleum coke from Midwest refineries in the 4.2-5.5% range.<sup>3</sup> This range does not take into account the higher sulfur Canadian tar sands crude that will be processed at expanding Midwest refineries, most notably the BP Whiting facility highlighted in the Wolverine study, and so is likely an underestimate of petroleum coke sulfur content for Wolverine. In comparison, subbituminous “low sulfur” coal has a sulfur content of 0.3 to 1.5% and bituminous coal ranges from around 1% to over 3%. In other words, pet coke can be more than eighteen times higher in sulfur than coal.

The higher the sulfur content of a fuel, the greater the emissions of sulfur dioxide (SO<sub>2</sub>), sulfur trioxide (SO<sub>3</sub>), and sulfates (SO<sub>4</sub>). SO<sub>2</sub> is associated with respiratory illness and aggravated heart disease; it also contributes to visibility problems at natural areas, acid rain, and damage to plants, water, and structures.<sup>4</sup> Higher levels of SO<sub>2</sub> mean higher levels of sulfates, as SO<sub>2</sub> reacts in the atmosphere to form sulfates. These tiny particles can lodge deeply in the lungs and are associated with increased respiratory symptoms and disease, difficulty breathing, and even premature death.<sup>5</sup> Higher levels of sulfur in the fuel also mean higher levels of sulfuric acid mist (H<sub>2</sub>SO<sub>4</sub> or “SAM”) from the combustion process. Condensation of the H<sub>2</sub>SO<sub>4</sub> can increase fine particulate matter<sup>6</sup> and PM10 as well. These particles again penetrate deeply into the lungs and are associated with respiratory disease and heart disease. Wolverine must demonstrate that it will meet stringent sulfur pollution limits through use of the cleanest fuel and optimal control equipment design and operation at all times.

Heavy metals. The heavy metal contents of petroleum coke also can be significant, again with specific levels depending on how the material is produced in a particular petroleum refinery. Metals of particular concern with petroleum coke are vanadium, nickel, and selenium. Studies have found associations between mortality and the vanadium and nickel content of fine particulate matter air pollution.<sup>7</sup> In addition, nickel can cause an allergic reaction in a significant

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<sup>3</sup> Wolverine Clean Energy Venture, “Fuel Supply and Fuel Selection Study for Wolverine Clean Energy Venture for Rogers City, MI,” Permit to Install Application, Appendix 2, at p.22 of 36.

<sup>4</sup> U.S. Environmental Protection Agency, “Health and Environmental Impacts of SO<sub>2</sub>,” available at <http://www.epa.gov/air/urbanair/so2/hlth1.html>

<sup>5</sup> Id.

<sup>6</sup> Particulate matter of less than or equal to 2.5 micrometers in diameter, known as “PM2.5”

<sup>7</sup> See F. Dominici et al. “Does the Effect of PM<sub>10</sub> on Mortality Depend on PM Nickel and Vanadium Content? A Reanalysis of the NMMAPS Data,” *Environ Health Perspect* 115:1701–1703 (2007).

portion of the population, with more sensitive people experiencing asthma attacks when exposed.<sup>8</sup> Excess levels of selenium in water can be toxic to fish, invertebrates, and the birds that eat them.<sup>9</sup>

In the absence of other data, it is likely that heavy metals, which form metal oxides, will be captured in the controls for particulate matter. Therefore, particulate matter pollution must be controlled to the maximum extent possible to minimize release of metals from the stack and the resulting health threats. Maximum control requires operating any PM control equipment at its optimal design efficiency and maintaining that performance over the life of the facility. It does not mean under-designing the equipment, running the equipment at lesser efficiency on a short-term basis, or allowing the equipment to deteriorate over time. Such lax design and operation of PM controls can risk harmful levels of heavy metals from petroleum coke. Wolverine should be required to demonstrate that its PM limits are based on the optimal design and operation of the PM control equipment over all conditions. Other concerns with metals in petroleum coke come from combustion waste, as described below. Again, all care must be taken to prevent metals in waste from entering the air and water.

Organics. Volatile organic compounds (“VOCs”) constitute a large number of harmful pollutants that are generally linked to cancer. Compounds such as polycyclic aromatic hydrocarbons, or PAHs, and related semi-volatile compounds have been detected in petroleum coke. The source of the petroleum coke, and the manner (i.e., process) in which it is formed in the refinery, will influence the amounts of organic constituents in the petroleum coke. Thereafter, transportation, handling and aging of the petroleum coke may also influence its organic content, and organic emissions. To the extent that petroleum coke will need to be accumulated and handled in the Wolverine plant prior to combustion, potentially volatile organic emissions may occur. The air permit application does not discuss any such emissions; nor does it provide any rationale for why such emissions are unlikely. Wolverine must estimate emissions of organics that are expected to occur from the transportation, handling and storage of petroleum coke, and demonstrate that it is sufficiently controlling this pollution through use of cleaner fuels and/or control measures.

Solid Waste Concerns. Exceedingly high volumes of solid waste are a major drawback of the type of boiler selected by Wolverine; indeed, one report cites adequate waste disposal capacity as a critical component in whether a project will be viable.<sup>10</sup> In addition, with most of the heavy metals in petroleum coke captured by PM controls, metals will end up concentrated in the fly and bottom ash waste. U.S. EPA has identified a site used for disposal of ash from coal and petroleum coke combustion as presenting documented damage to human health and the environment, citing metals contamination:

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<sup>8</sup> See Agency for Toxic Substances & Disease Registry, “ToxFAQs for Nickel,” (2005) available at <http://www.atsdr.cdc.gov/tfacts15.html>

<sup>9</sup> See U.S. EPA, Selenium Aquatic Life Criterion, available at <http://www.epa.gov/seleniumcriteria/questions.htm>

<sup>10</sup> See R. Narula (2005), “Challenges and Economics of Using Petroleum Coke for Power Generation,” available at [http://217.206.197.194:8190/wec-geis/publications/default/tech\\_papers/17th\\_congress/1\\_2\\_26.asp](http://217.206.197.194:8190/wec-geis/publications/default/tech_papers/17th_congress/1_2_26.asp)

**Chisman Creek, Virginia** (described in the 1988 Report to Congress). Fly ash and bottom ash from the burning of coal and petroleum coke were managed in a disposal pit. The site was on the National Priority List [ , a.k.a, Superfund,] as of 1988. Drinking water wells became green from vanadium and selenium contamination, and contained selenium above the primary MCL [ , or maximum contaminant level for drinking water,] and sulfate above the secondary MCL.<sup>11</sup>

Thus, sufficient waste disposal capacity and proper handling and disposal of contaminated ash are of prime importance. Two troubling issues with fly and bottom ash are water pollution from waste pile runoff and leaching of toxins from disposal sites into groundwater, and air pollution from wind blowing across piles of waste and from the handling and transportation of waste. The latter is addressed in the below section on Handling and Transportation Concerns.

All efforts must be taken to prevent high metal content ash from contaminating water, especially Lake Huron and groundwater in the sensitive karst areas of Presque Isle and Alpena Counties. The facility is located directly adjacent to Lake Huron and runoff from waste located on site may enter the Lake. With respect to karsts, Michigan State University explains contamination concerns as follows:

A karst is formed from limestone, dolomite or gypsum dissolving in solution, and is characterized by closed depressions or sinkholes, caves and underground drainage. Through these open channelways water can move very rapidly from the surface to the groundwater, creating an extremely high aquifer recharge rate. This unusual feature makes drinking water more highly susceptible to contamination from surface activities. Since much of the 284,000-acre sensitive [karst area in Presque Isle and Alpena Counties] relies on private wells that are drilled directly into the karst, any contamination of the water will cause serious environmental health risks.<sup>12</sup>

Clearly, disposal of petroleum coke and coal combustion waste should not occur on or near karstic areas, due to the threats to local drinking water.

Despite these red flags, Wolverine has not provided sufficient information and assurances that waste from the project will not harm the environment. The air permit application vaguely states that fly ash and bottom ash will be trucked to off-site disposal areas.<sup>13</sup> However, the site plan contains several large areas clearly marked as “coal combustion waste landfill,” with several areas in or near land with negative spot elevations. The company also has represented that the ash will be sold for production of gypsum board, but has not identified a buyer or stated how much ash will be sold. Experience with other plants across the country has shown that sale of all the ash for reuse is highly unlikely. For these reasons, Wolverine must clarify the expected volumes of ash from burning petroleum coke and coal, how much ash will be sold for reuse and to whom, how the ash will be transported (see below), and where any remaining ash will be

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<sup>11</sup> U.S. EPA, Waste from the Combustion of Fossil Fuels, Vol. 2 (1999), available at [www.epa.gov/epaoswer/other/fossil/volume\\_2.pdf](http://www.epa.gov/epaoswer/other/fossil/volume_2.pdf)

<sup>12</sup> MSU Groundwater Education in Michigan, “Karst Aquifer Protection Project,” available at <http://www.gem.msu.edu/casestd/karst.html>

<sup>13</sup> Application Appendix 4, “Fly Ash System” and “Bed Ash System”

disposed. Most importantly, it must ensure that sufficient disposal capacity exists for the large volume of expected waste and that disposal sites are located away from karst features, and demonstrate that other appropriate measures will be taken to prevent leaching from disposal sites that are likely to threaten sensitive karst areas and other water resources.

*Handling and Transportation Concerns.* As noted above and as EPA and tribal groups have recognized, handling and transportation of petroleum coke poses concerns for pollution as well. Petroleum coke transport can produce PM2.5 and PM10 pollution, and emissions of numerous toxics including PAHs and heavy metals.<sup>14</sup> Similar pollution can occur from transport of coal combustion waste. For these reasons, Wolverine should clearly demonstrate how it will minimize pollution from transport of petroleum coke to the plant and ash from it. Wolverine should also quantify the amount of diesel truck pollution that will accompany the numerous trips needed for the large volumes of waste from its chosen boiler.

### ***Air Pollution Limits***

As explained above and in our previous letter, Wolverine is proposing limits that it can meet under a *worst-case fuel scenario*. In other words, the plant will be able to relax the operations of control equipment when burning less dirty fuels. A Special Use Permit should only issue for the Wolverine project if the plant meets Clean Air Act standards by demonstrating that it will achieve the maximum reduction of pollution feasible over all operating conditions, i.e., for *all* fuels burned. This outcome can be achieved adopting limits based on the cleanest fuel and burning only that fuel, or potentially by including fuel-specific air emission limits for different categories of fuel burned.

### ***Conclusion***

In sum, we have serious concerns about the proposed Wolverine project and its impacts on local air and water quality. We believe that the above concerns are more than sufficient grounds for declaring that Wolverine's fuel plans are grounds for revocation or constitute a "major" amendment of the site plan underlying the July 2006 SUP. In any future SUP proceedings, we respectfully ask that the following be taken into consideration:

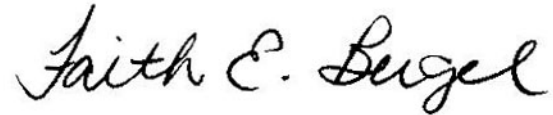
- Whether Wolverine is proposing limits reflecting the use of clean fuels and/or fuel-specific air pollution limits;
- Whether use of dirtier fuels will result in water pollution from runoff, leaching from disposal sites, and/or other sources; and
- Whether other impacts related to transportation and handling of the fuel and waste require SUP conditions to limit pollution from the project.

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<sup>14</sup> See T. Basabe (2006), Swinomish Air Quality Program, Swinomish Indian Tribal Community, "Petroleum Coke Dust from Open Rail Cars in Northwest Washington and Southwest Brithish [sic] Columbia" (describing joint U.S. EPA, refinery industry and tribal Partnership for International Emissions Reductions), available at [www.epa.gov/OSP/tribes/announce/NatForum%20Present/3\\_2.pdf](http://www.epa.gov/OSP/tribes/announce/NatForum%20Present/3_2.pdf)

If you have any questions, please do not hesitate to contact Faith Bugel, ELPC staff attorney (312-795-3708, fbugel@elpc.org). Thank you for your time and attention.

Sincerely,

A handwritten signature in black ink that reads "Faith E. Bugel". The signature is written in a cursive style with a large, prominent "F" and "B".

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Faith E. Bugel  
Senior Staff Attorney, Environmental Law and Policy Center

On behalf of:

Clean Water Action  
Michigan Energy Alternatives  
Michigan Environmental Council  
Michigan Land Use Institute  
Sierra Club Michigan Chapter