Mesaba Energy Project, PUC Docket No. E6472/GS-06-668

DOE Draft EIS for the Mesaba Energy Project (DOE/EIS-0382D)
Comments on Draft EIS

Submitted by: Citizens Against the Mesaba Project

4.3 Air Quality and Climate (including Greenhouse Gases)

I. Assumptions built in to modeling, and data used:
As citizens, reviewing the data and analysis of the affect of Mesaba I/II on air quality and climate is difficult as only the results are presented, and not the modeling assumptions or data used to come up with the results. This is like a math teacher getting a sheet of answers and telling the student, "but show me your work…How did you come up with these numbers?"

Right off we noticed that MN Steel, a "reasonably foreseeable future action in the project vicinity," was not included as a major source input in the description of Mesaba's Predictive Modeling Approach. (4.3-2). We discovered that MN Steel data is included in chapter 5 in the cumulative affects section, but we wondered ***what is the affect on modeling without including MN Steel's data?*** This led us to turn to MN Steel's Final EIS and compare their section on affect on air quality to Mesaba's DEIS. We found what we think are discrepancies in the data presented regarding the quality of the existing air, and even differences in the standards used for analysis. It also triggered more questions about how reflective the results of the modeling are of the on-the-ground reality.

For example, regarding Particulate Matter, which has been found to be detrimental to health, the PSD increment standard for PM10 in Mesaba's DEIS is 37 (p. 4.3-18). But the standard in MN Steels' FEIS is stated as 30 (FEIS, p. 4-103). Mesaba says it will emit PM10 at a rate of 23.5 in a 24 hour period. MN Steel says it will emit PM10 at 26 ug/m3 in a 24 hour period. The total of the two emission rates is 49.5 in a 24 hour period which exceeds even Mesaba's higher standard rate of 37.

Mesaba's DEIS did not include wet or dry depletion/deposition in the modeling" (4.3-1). *Why not?* MN Steel's FEIS did include this. An EPA document explains that, "Wet and dry deposition are important processes in indirect exposure modeling because they account for the movement of constituent mass from the atmosphere to soil, water, and vegetation" (p. 5-28).[1]

And **why use such old data**? Appendix B in Mesaba's DEIS states, "The meteorological data are based upon Hibbing, Minnesota hourly surface weather observations for the years 1972 through 1976" (B.1-1) Mesaba's DEIS (4.3-3) states that upper air data from

two stations were used: St. Cloud and International Falls for 1990 and 1992; and Minneapolis and International Falls for 1996. More current data is available. The US EPA site has links to the "**Radiosonde Data of North America (RDNA)**" which is a standard upper air database provided by NCDC, containing data through 1997 data. Another data bas has hourly and synoptic type data for approximately 12,000 global stations are available for 1995-2005. Upper air data for 1990-present are also available.

We also found what we think are **discrepancies and deficiencies in data** in Mesaba's DEIS when compared with MN Steel's FEIS. For example:

In the analysis of the affect on air quality in the Class II area:
-Mesaba shows an existing background of Sulphur Dioxide (SO2) at 10 ug/m3 in 1 hour, while MN Steel shows 90.
-Mesaba shows background Nitrogen Oxide (NOx) being 5 annually, while MN Steel shows it as being 12.
(MNSteel page 4-91, Mesaba page 4.3-11).

Regarding the Class I area (Federally Protected areas like the Boundary Waters):
-Mesaba does not include Isle Royale.
-Mesaba does not include wet or dry deposition information for sulfur and nitrogen, or ozone concentrations info.
-MN Steel shows that the maximum allowed SO2 concentrations in 3 hr period in the BWCAW is 10.8, but Mesaba's DEIS indicates it's 1.5.
(MNSteel page 4-92, Mesaba 4.3-13).

II. Air Pollutant Emissions Significantly Above Thresholds:
No matter what data was used in the modeling, it still turns out that **Air Pollutant Emissions from the proposed Mesaba I/II facilities are significantly above threshold levels.** ***Mesaba Energy will emit 9 of the 10 Air Pollutants at levels significantly above the threshold level.***

For example, Mesaba will emit 2,872 tons/per year of nitrogen oxide and the threshold is 40 tons per/year. This is in addition to the 59,701 tons/year of Nitrogen Oxides (NOx) emitted from regional facilities that currently exist,[2] and MN Steel's planned addition of 1,505 tons/year of Nitrogen Oxides. Mesaba will emit 1,390 tons/year of Sulphur Dioxide and the threshold is 40 tons/year. This is in addition to the 36,491 tons a year that are already emitted from regional sources, and MN Steel's facility will add yet another 421 tons/year to our air.

Pollutant	**PSD Significance Threshold (TPY)**	**Plantwide Potential to Emit (TPY)**
Carbon Monoxide (CO)	**100**	**2,539**
Nitrogen Oxide (NOx)	**40**	**2,872**
Sulphur Dioxide (SO2)	40	1,390
PM	25	503
PM10	15	493 (West)
O3 as VOC	40	197

(Volatile Organic Compound)		
Sulfuric Acid-mist	7	130
Hydrogen Sulfide	10	17

Mesaba DEIS Table 4.3-1

Nitrogen oxides and ozone:
Nitrogen oxides and ozone play a major role in formation of particulate matter and ground level ozone (smog). Ozone causes respiratory illness and lung inflammation. On high ozone days there is a marked increase in hospital admissions and emergency room visits for asthma and other respiratory illness.[3] Ozone forms in the presence of nitrous oxides, volatile organic compounds, light, and heat. The Mesaba plant would produce 2,872 tons/yr of nitrous oxides and 197 tons/yr of volatile organic compounds.

Particulate Matter:
With regard to particulates, PM2.5 is thought to have the most significant adverse impact on human health. Secondary formation of particulate matter can also have a significant impact on human health. In Mesaba's analysis, PM10 and SO2 exceed the threshold monitoring concentrations, but all Mesaba says that it will do about this about this is make application requesting a waiver of the preconstruction monitoring requirements (Mesaba 4.3-12). Not only has Excelsior Energy been exempted from demonstrating need for the entire project altogether, or whether it's the least cost alternative, they want to be exempted from monitoring requirements, as well.

III. Understatement of affects of Mercury:
Mesaba I/II will release up to 54 lbs of mercury per year. But Mesaba's DEIS only presented information for area within a 3 kilometer radius (4.3-26). A report of the mercury impact zone includes 720 lakes over 320 square km.[4] 487,000 fish are annually harvested from these lakes and 7,780 women of child-bearing age and children live here. Chronic mercury exposure in a developing fetus can cause mental retardation, growth deformity, seizures, blindness, deafness, and severely delayed development. Chronic mercury exposure of infants and small children can cause impaired reflexes, delayed motor development, impaired attention, impaired memory, and impaired language. Low level mercury exposure from fish consumption may lead to heart attack, and hardening of the arteries, especially in adult males.

The effects of mercury are well-known. A March 2007 report from the Pollution Control Agency stated that "MPCA scientists calculate that mercury emissions will have to be **reduced 93 percent from 1990 levels for fish mercury levels to be reduced to safe levels.** The MPCA has established a goal of reducing Minnesota mercury emissions by 93 percent, to 789 pounds per year, and is working with the U.S. Environmental Protection Agency to address out-of-state sources."[5] Amidst these efforts to reduce mercury in the environment, why add another 54 lbs a year when the need for this electricity has not even been shown?

IV.Acid Rain:
As a utility generating unit greater than 25 MW, Mesaba also exceeds allowable emissions that contribute to **acid rain**. To deal with this, all they write is that they are required to obtain and comply with a Phase II Acid Rain Permit "in a manner consistent with EPA's overall efforts to reduce emissions of acids precursors" (4.3-24).

V. Major Greenhouse Gas Producer/Adding to Global Warming:
Mesaba will emit 9.4-10.6 million tons/year of CO2, a major greenhouse gas that contributes to global warming (4.3-25). Mesaba discusses its plan for Carbon Capture & Sequestration (CCS) in Appendix A and states that CCS would reduce emissions by 30%. But it is very expensive to actually do CCS, and the technology is not yet proven. So, this DEIS was careful to include a statement about what more they will ask for to implement CCS: "upon approval of a modification to the proposed power purchase agreement that would allow for Excelsior to be compensated at a reasonable cost of capital for the necessary capital investments, and to be made whole on the other costs associated with the CCS program" (A-1). Translation: without major additional taxpayer money, there is no plan to reduce CO2.

VI. Affect on Class I area Visibility and Regional Haze:
Mesaba would cause **regional haze** in Class I areas like the Boundary Waters Wilderness Canoe Area, and in its own words, "Project-related impacts occurring during periods of natural visibility degradation would have added effect" (4.3-29).

MPCA's July 2007 draft "Concept Plan for Addressing Major Point Sources in Northeastern Minnesota"[6] states, "Concerns have been raised by Federal Land Managers (FLM) and others about the impact of new and existing sources in NE Minnesota on visibility in the Class I areas – due to both proximity and high emissions" (p. 2). The MPCA has to submit a Regional Haze Plan to the EPA by December 2007. MPCA's plan calls for a 30 percent reduction in combined sulfur dioxide (SO2) and nitrogen oxides (NOX) emissions in Northeastern Minnesota. Again, why add more sources of pollution?

Back to our questions about the modeling technique used: Mesaba's DEIS states that "CALPUFF is the approved long-range transport model" (4.3-2). But an EPA document: "CALPUFF Analysis in Support of the 2005 changes to the Regional Haze Rule**,** published in June 15, 2005,[7] provided this further explanation of the limitations of using CALPUFF. The report states that, "The challenge we encountered is that CALPUFF has not been fully tested for secondary formation and thus is not fully approved for applications in PSD permitting and NAAQS attainment demonstrations (i.e., it is approved for primary particulates, but not for secondarily-formed particulates)" (p. 1).

A report prepared for the DOE assessing reliability of CALPUFF the modeling used for visibility stated that: "CALPUFF is primarily a multi-source plume model that treats transport downwind and dispersion along the transport path. The representation of gas phasechemistry is highly simplified. These simplifications are likely to be deficient when applied to situations in which complex chemistry dominates the processes responsible for

formation of secondary air pollutants. Such secondary air pollutants are an important source of visibility degradation." The report further stated that, "The agreement between measured and estimated aerosol concentrations using this [CALPUFF] approach is random and poor. Thus, we are concerned that the simplistic approach to aerosol formation may produce significant errors"[8]

Expert testimony provided to the state of Washington on a similar matter found: "The CALPUFF model used in this analysis represents a simplified treatment of visibility and haze. It does not account for the effect of secondary organic aerosol formed as a byproduct of VOC emissions and does not account for the effect of gaseous pollutants, NO_2 in particular, which may lead to a modest underestimation of the impact on visibility. It also does not fully account for the contribution to particulate matter made by NH_3 emissions."[9]

Even accepting CALPUFF as the best means there is of modeling, Mesaba uses old data. For example, Mesaba used data from 1990, 1992, 1996 (Mesaba 4.3-20), while for the same calculations MNSteel's FEIS used data from 2002, 2003, and 2004 (MNSteel page 4-107). Mesaba's DEIS (using the older data) states that it will "reduce visibility in the BWCAW by more than [the unacceptable rate of] 10% from 40-70 days a year" (4.3-20) This would be in addition to existing regional source contributions….

Further, Mesaba's DEIS states that "PM10 concentrations at the Boundary Waters over a 24-hour averaging period exceeds the SIL," and that "at the West Range site, SO2 impacts are above the SIL" (page 4.3-18). Data in MNSteel's FEIS, which was not included in this section of Mesaba's DEIS stated that MNSteel's contribution to PM10 in the Class I area would range from 4.83 to 7 days for the 3 years modeled. The increment standard is 8 g/m3 for Class I Areas. *It appears the combination of Mesaba and MNSteel's emission of PM10 exceeds the increment standard.*

Deposition of Nitrogen and Sulphur in Class I Area:
MNSteel's FEIS explains the **affects on plant and animal species of deposition of nitrogen and sulphur,** "In evaluating potential adverse effects to flora and fauna, lichen species are generally used as a threshold indicator of potential air pollution damage because they are especially susceptible to air pollution and show adverse effects before other plant species and animal species. If pollutant concentrations in a Class I area are sufficiently low that no damage occurs to native lichens, then it can reasonably be concluded that all other flora and fauna species are protected. The most sensitive lichen species are only present when annual average SO2 concentrations are less than 40 g/m3" (MNSteel 4-104).

Mesaba's DEIS does not provide contextual explanations like this, but does state that the maximum annual deposition of S and N from Mesaba in the Class I Boundary Waters Class I area is "greater than the National Park Service's Threshold" (Mesaba 4.3-21). Rather than include mitigation options, the Mesaba DEIS says, "it is unlikely that the Mesaba Energy Project would cause an adverse effect…because the emission data they entered was very conservative (4.3-22). This statement does not square with the known limitations of using CALPUFF as stated by the EPA and DOE reports cited above.

VII. Mitigation:
Mesaba's DEIS states in its summary of impacts that their facility "***would be a major source"*** of Hazardous Air Pollutants. They only offer five bullet points (4.3-32) about mitigation measures of "process modification and improved work practice [that] would be implemented to limit annual emissions." For example, they say they would use clean syngas or natural gas, good flare design, good combustion practices and limiting the fire pumps and emergency generators. ***They do not provide any specifics about these process modifications, and they do not provide any information about how much these measures would reduce emissions***. Without data on the amount of reductions and measures to be taken to mitigate emission of hazardous air pollutants, their plans to mitigate hazardous air pollutants are woefully inadequate to make any real difference in the degradation of air quality and resulting dangerous affects to our health and the environment.

VIII. Inaccurate statement regarding Mineral Loss:
On page 4.4-13 the DEIS states there will be "no mineral loss." This is not accurate. The site falls within the prime area that Itasca County is now considering to zone for potential future mining activities. A DNR report[10] states that from the west half of the Arcturus Mine to Canisteo there are 460 million long tons of partially oxidized to unoxidated iron-formation. Included in this figure is a subset of unoxidized taconite estimated to total 87 million long tons (DNR October 2003). With the price of steel, and new technologies there are conversations currently underway about mining in the area of the proposed Mesaba facility.

IX. In section 4.3.5.2. **Effects on Economic Growth**: Mesaba states, "180 workers will be employees following construction of the second phase in 2014." This is one of the main reasons people support this project. But the Mesaba DEIS is careful to qualify this by saying: "To the extent practical and consistent with skill and operational requirements, the project plans to employ people in the local area…"(4.3-21). ***How many people from the local area will be eligible to be employed? Is there are breakdown of job types/job descriptions?*** The uncertainty in their promise to employ local people does not justify the tremendous degradation to air quality described in this DEIS.

Notes
1. www.epa.gov/epaoswer/hazwaste/id/paint/section5-6.pdf
2. NE MN Emissions Inventory from Regional Facilities in 2002:
<http://www.pca.state.mn.us/publications/presentations/haze-nemnplan.pdf>
3. "EPA National Air Quality and Emission Trends Report"
4. ICF Consulting for Excelsior Dec. 14, 2005
5. < http://www.pca.state.mn.us/publications/p-p2s4-06.pdf>
6.<http://www.pca.state.mn.us/publications/presentations/haze-nemnplan.pdf>
7. **"CALPUFF Analysis in Support of the 2005 changes to the Regional Haze Rule** June 15, 2005. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards."
<http://www.epa.gov/scram001/reports/tsd_calpuff_for_bart.pdf
8. <http://www.osti.gov/bridge/servlets/purl/764382-oMp4zO/webviewable/764382.PDF>
9. <http://www.efsec.wa.gov/Sumas2/adj2001/bcprefiled/mfl-t.pdf>
10. Zanko, L.M, et. Al. "Oxidized Taconite Geological Resources for a Portion of the Western Mesabi Range (West Half of the Arcturus Mine to the east Half of the Canisteo Mine), Itasca County, Minnesota –

A GIS-based Resource Analysis for Land-Use Planning." NRRI/TR-2001/40. Duluth, MN: Natural Resources Research Institute and Department of Geological Sciences, U of MN, Duluth, October 2003.

Our questions and comments are only directed to this one section of the Draft EIS. There are many other concerns and questions raised by others that we hope the final EIS will address. We are looking for the final EIS to show a true cost/ benefit analysis of this project's promise of serious pollution in an area that does not even have the coal, but rather, is blessed with valuable forests and waters, federally protected wilderness, tourism and iron ore. Also, given the evidence regarding global warning, how can the DOE consider this project without including sequestration an alternative energy project that has any benefit to people or the environment? We strongly feel that the expenditure of tax-payer money on this project is wasteful, and instead our resources should be spent on truly alternative and renewable energy projects.

Thank you for your consideration.