Opinion of John Ipsen, M.D., PhD
Particulate Air Pollution from the Proposed NorthMet Project
Risks to Human Health
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There are unanswered questions about particulate air pollution from the proposed NorthMet Project. Discharges of fine particulates including amphibole elongated mineral particles - pose a health risk to the mineworkers and to the surrounding communities.

The FEIS indicates the proportion of amphibole fibers is expected to be 9% of total fibers and there are 2% chrysotile (serpentine) fibers present. They argue these are low concentrations and not worthy of attention. However because the total quantity of particulates produced is great, the amount of amphibole and chrysotile fibers is significant.[1]

The MN Department of Health and the FEIS state that these fibers represent an uncertain risk to human health and have the potential for an undetermined toxicity and potency. There is ample information in the scientific literature to raise concern. Without a thorough evaluation of the potential for exposures and the risks involved, we will be relegating the miners and the people in the surrounding communities who breathe the air to participate in an experiment they did not plan to be part of.

Amphibole fibers have been shown in the 6-year Taconite Workers' Health Study to be associated with increased risk of mesothelioma and other diseases. There is a 2.7-fold increase in mesothelioma in miners exposed to taconite air pollution. The risk of mesothelioma rises 3% for every year of exposure. That becomes 75% over a 20-yr career and 130% over a 30-yr career.

Other identified risks include an 11% increase in Coronary Artery Disease (which is of course far more common than mesothelioma), and cancers of the larynx, stomach, and bladder. The personal and financial burden of these illnesses would be significant.

The EPA has set thresholds for particulate air pollution. The PM10 standard is for coarser dust 10 microns and below and the PM2.5 standard is for fine dust 2.5 microns and below. PM2.5 would contain most of the elongated mineral fibers. The FEIS analyzes discharges of these two sizes of particulates. However, according to Dr. Ehlinger's comments on behalf of the MN Department of Health, silicate mineral particles sized *4* microns and below are hazardous because 4 microns is closer to the cutoff for particles that become lodged in the deeper parts of the lung. The FEIS does not address this and thus it likely underestimates the risk of particulate releases.

In addition there is recent research by Shi et al. that has brought into question the EPA thresholds for PM2.5, and indicates human health is adversely affected by much lower levels of fine dust than was previously thought.

The FEIS indicates in Table 6.2.7-6 that cumulative noncancer risks do not exceed the threshold risk of 1, but simple addition indicates they do. By rounding values that exceed 1 to one significant digit, the FEIS declares a 20% exceedence of the recommended limit to be to be of no concern.

Containment of fine particulates at mining operations is challenging. The FEIS discusses a number of control measures planned at the plant site. The plans do not provide enough assurance that particulate releases will be adequately suppressed.

HEPA filters will be used downstream from bag filters, but in only 23 of 35 dust-producing units (and in 8 of the 23 only during heating season). Bag filters reduce the PM 2.5 burden to 2.5 micrograms per cubic foot of air, but as the volume of air produced is great, the particulate burden is more significant than they would like to admit. Where the trapped fines from the filters will go is not addressed.

The tailings basin beaches will be a source of dust and the claim that capillary action will keep the surface moist and prevent the wind from blowing particulates aloft has not been substantiated or quantified.

Water will be used in some operations to reduce dust, but wherever the particulate-laden water goes, once it evaporates, the dust will be exposed.

The contribution to air pollution from what's termed "fugitive dust" has not been not been rigorously analyzed. The control measures identified at the plant site are only theorized to provide adequate suppression of dust.

The rail transport of ore from the mine site to the plant site is claimed to have minimal contributions to airborne particulates but there is concern that 6 miles of railbed could accumulate a significant quantity of dust from the 32 thousand tons of ore transported daily and that the dust will be carried off by the wind.

The FEIS indicates that the concentration of airborne fibers drops off quickly as distance from the point source increases. However we know the particulates can travel far. For example, we know that the airborne concentrations of amphibole fibers measured 12-15 miles away at sites near Ely are highest when the wind blows from the direction of the eastern iron range - due to activity at taconite operations that are about a mile from the proposed PolyMet site. Conversely the lowest amphibole particulate levels on record occurred during a taconite miners' strike.

Another significant omission in the EIS documents is the pollution that will be produced by remote power generation supporting the energy needs of the project. Much of this is likely to be supplied by coal combustion and on top of its contribution to greenhouse gases this will have deleterious health effects due to release of SOx, NOx, mercury, and particulates. This could have a major impact on the consequences of the NorthMet Project but beyond the contribution to greenhouse gases it is not addressed.

In sum, the FEIS incompletely addresses particulate air pollution. The analysis provided in the FEIS is inadequate to reasonably address the health risks of the proposed mine – risks to the mineworkers and to people living in the surrounding communities. A Health Impact Assessment from a qualified independent evaluator is necessary to clarify the risks of this proposal.

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Endnote

[1] It is noteworthy the data used in preparing the FEIS fiber analysis were obtained by a non-standard technique using a grinding process (grinding rock specimens with mortar and pestle to a fine powder) that brings into question the results.

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