



The Threat of Metallic Sulfide Mining to Wilderness: An Introduction

Making predictions about the future of wilderness advocacy is risky. Who knows what new threat to wilderness will be reported in tomorrow's newspapers? One thing appears certain. For the next several years, metallic sulfide mining issues will be on everybody's list of the most significant threats to Northeastern Minnesota.

Metallic sulfide mining was proposed initially several years ago in the PolyMet Project. PolyMet Corporation proposes to mine for non-ferrous metals, primarily copper, nickel, cobalt at the NorthMet Site near Babbitt and to process the ore at the former LTV facilities near Hoyt Lakes. Metallic sulfide mining is exceedingly dangerous. The primary danger is the long-term threat of sulfuric acid entering nearby waters and wetlands through leakage from presumably 'contained' disposal sites.

The PolyMet Project has been opposed primarily as a threat to public health and safety. NMW has joined in that opposition. The mine site is about 20 miles from the BWCAW and the major environmental threat is to the Lake Superior Watershed. NMW has joined with other environmental/wilderness groups to monitor the possible effects of PolyMet on wildlands and Lake Superior. PolyMet is the first proposed extraction from the Duluth Complex of ore which runs northeast from Hoyt Lakes.

Three new Duluth Complex projects (Duluth Metals, Franconia, and Teck Cominco) are now in the test drilling stage in the vicinity of the Kawishiwi River south of Ely. In addition to public health and safety issues, these projects pose even more direct threats to the BWCAW and nearby wildlands:

- 1) Drainage from the mines and waste rock sites will be into the Kawishiwi River Watershed and thus directly into the BWCAW;
- 2) Mining is likely to occur within a mile or less of the BWCAW boundaries in a direct threat to wilderness and the wilderness experience.
- 3) At least one of the mines (Franconia) will be an underground mine extending beneath Birch Lake (near Babbitt). A metallic sulfide mine collapse beneath a body of water would likely release sulfuric acid in overwhelming quantities as well as alter and damage the lake itself. This is a central issue in the proposed Kennecott Mine in Michigan.

NMW opposes the Kawishiwi River area projects (in their current form) as well as the PolyMet Project. If NMW and

others succeed in their opposition it will probably be through a lengthy process. Opposition is proving exceedingly difficult for several reasons.

- 1) The basic Federal Law regulating mining is the antiquated 1872 General Act on Mining. The law provides virtually no environmental protections and certainly none to wilderness.
- 2) Minnesota is a decidedly pro-mining state. Scientists in the several relevant agencies are capable but their resources are limited. Most importantly, the basic approval decisions will be made by political appointees.
- 3) The technology of sulfide mining is reported to have improved considerably since the well publicized mining disasters of the past several decades. The almost immediate problems that occurred in the past appear to have been largely overcome through improved mining and processing techniques. The major threat, however, remains the long-term threat of sulfuric acid in water runoff from waste rock. This threat could take decades or longer to become evident.

NMW does not have a current position statement on metallic sulfide mining. We hope to develop one through a process of consultation with the membership, beginning with the Annual Meeting, October 13.

The following two articles are intended to inform the membership about the threats posed by metallic sulfide mining and about the current situation. Elanne Palcich has written on the threats, Will Hauser on the current situation in the vicinity of the BWCAW.

NMW will succeed in containing the threats of metallic sulfide mining only through member involvement. Please send us your comments (www.nmw.org) and volunteer your time in this important area.

Brad Sagen, NMW Board Chair

**A Grassroots Advocacy Group
for the Protection of the BWCAW**

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The Potential Disaster of Sulfide Mining in Northeastern Minnesota

I began following the saga of copper-nickel-PPG (platinum, palladium, gold) exploration in Minnesota following the Polymet environmental scoping meeting held in Hoyt Lakes in June of 2005. I returned home armed with the 200+ page document. Even though acid mine drainage was not mentioned at the public hearing, I began to discover that acid mine drainage (AMD) is a significant problem when mining in metallic sulfide ores. My review also revealed that basic problems will be compounded in the PolyMet Project.

Acid Mine Drainage. The basic environmental threat that occurs in sulfide mining is from the highly toxic sulfuric acid found in mine waste and processing residue. In the Duluth Complex, the non-ferrous metals of interest, copper, nickel, cobalt and the PPG group (platinum, palladium, and gold) occur in sulfide-containing rock. When this rock is brought to the surface and exposed to air and water, a chemical reaction produces sulfuric acid. It may take two or more years for this process to begin, but once started, acid mine drainage (AMD) leaches into the environment for decades if not hundreds or thousands of years. One example is an ancient Roman copper mine still creating AMD.

Because of the low ore content of sulfide laden rock, enormous waste piles are created. The Polymet site will produce a 320 foot waste rock heap, visible from the Boundary Waters. The water drainage containing sulfuric acid from these piles must somehow be treated or contained.

Sulfuric acid not only leaches from plant tailings, but also from waste rock and pit walls. In underground mining, acid drainage leaches through cracks and faults in the rock, some caused by mining disturbances.

Even without sulfuric acid, heavy toxic metals from the ores leach into the environment. In a synergistic fashion, the sulfuric acid leaches out more of the metals, which can include copper, nickel, cobalt, arsenic, cadmium, lead, zinc, and mercury. These contaminants prove deadly to aquatic life and this damage affects the entire food chain.

PolyMet's treatment plans include storing tailings and waste rock on plastic liners and channeling drainage water through a treatment process before discharge into the watershed. Note that all liners whether plastic or concrete eventually leak. No current sulfide mine world-wide is operating without creating environmental harm.

Minerals Processing. PolyMet proposes to use an improved processing technology involving hydrometallurgy leaching minerals using sulfuric acid in water at high temperatures through an autoclave process. The liquid and solid waste from processing must be treated and contained, if not in perpetuity, at least for decades. Hydrometallurgy is a largely unproven process. No significant problems have been reported but there are no examples of long-term use of the technology.

Sulfuric acid mist is a sulfide byproduct of processing non-ferrous ore. This mist is used to help leach trace minerals out of

the ore. Note how this parallels AMD. Just as AMD affects the water environment, escaping sulfuric acid mist affects the air. Sulfuric acid mist emissions are to be prevented from escaping by the use of wet scrubbers.

Projected air emissions, based upon 99% wet scrubber efficiency, are 12 ½ tons per year of sulfuric acid mist/SO₃, 3 ½ tons of SO₂, and 78 tons of NO_x. These pollutants produce acid rain, which also promotes the leaching of toxic metals. The sulfur oxides in acid rain contribute to mercury methylation--which in turn results in the bioaccumulation of mercury within the food chain--and fish consumption advisories.

A total of 59 air pollutants are listed in the PolyMet scoping document. In addition, thousands of tons per year of CO₂, a greenhouse gas, will contribute to global warming. Particulate matter, via a smokestack, and mining equipment exhaust will produce haze.

The plant process also requires the use of chemicals to help leach out the metals. For example, the chloride in hydrochloric acid is used to precipitate out platinum. Hydrochloric acid will be brought in by rail. Sulfuric acid will be needed for pH balancing. Other chemicals include Shellsol A100 (including naphtha, cumene, xylene, and trimethyl benzene), sodium hydrosulfide, acid flocculent, caustic NaOH, lime, and several hundred thousand tons per year of limestone.

Other Mining Concerns. Non-ferrous metals are found in low grade ore. The PolyMet site and the entire Duluth complex is especially low grade and profitable mining would not be possible except for improved processing technology (and probably because of the enormous direct and indirect Federal and State subsidies). The average grade of metals in PolyMet ore deposits is .44% copper, .11% nickel, 78.9 ppm cobalt, 83.0 ppm zinc, 1.6 ppm silver, .425 ppm palladium, .110 ppm platinum, .060 ppm gold. (The PPG group is especially lower grade.) Because of the low grade ores, PolyMet and other mining companies in the Duluth complex are under enormous pressure to cut costs. The State in turn will be pressured to approve lesser environmental protections in order to promote mining.

Mining will create excess noise and light pollution on a 24 hour basis. Other Duluth Complex proposed mine sites are within one mile of the BWCAW.

Another area of concern is the loss of wetlands and wildlife habitat. The 1200 acres of wetlands to be destroyed in the PolyMet Project is the largest single loss in the history of the Army Corps of Engineers. Although the DNR claims that mining will have no significant impact on wildlife populations, this cannot be scientifically valid. For example, birds are being impacted all along their migratory routes, so there is a cumulative effect on bird populations. Mining and roads including the proposed corridor between Hoyt Lakes and Ely will crisscross and fragment animal habitat.

As we near the completion of the draft Environmental Impact Statement (EIS) process, slated for November of 2007, I have many new concerns. The EIS will not address global warming, mesothelioma, or lynx habitat. The amount of exploratory drilling going on right now is destroying habitat and creating the potential for future contamination. The DNR is not considering the cumulative effects of proposed mining within the entire Duluth Complex.

Instead, the minerals division of the DNR is assisting mining exploration. The Range legislative delegation and the governor are doing all they can to fast track permitting of metallic sulfide mining. Exactly what are the stringent environmental laws that Minnesota supposedly has in place to protect our environment, and how will a one mile buffer zone protect the Boundary Waters?

Alternative Futures. According to Duane Elgin, author of Voluntary Simplicity, it would take five Earths to support a world population of 6.5 billion at the U.S. level of consumption.

Metallic Sulfide Mining Near the BWCAW?

Since the 1960's a handful of geologists and mining engineers has been roaming the woodlands and wetlands south of Ely, along the shores of the Kawishiwi River and Birch Lake. Their intent has been to verify the presence and quality of heavy metals mostly nickel in the sulfide-bearing rock underfoot. Minerals were found, core samples were taken and federal and state officials let leases. Metal prices were, however, too low for profitable extraction. So, while full scale operations did not proceed at the time, the leases remained active (but unused) for decades. Now, world-wide industrial development is soaring and with it the demand for copper, nickel, platinum, palladium, cobalt and gold. New mining companies have appeared out of nowhere, formed consortia and partnerships, and with the blessings of Governor Pawlenty and most Iron Range politicians are drawing up plans and laying the foundation for what the Governor has dubbed "Minnesota- the Mining State." Polymet, Franconia Minerals, Lehmann Exploration Management, Inc., Teck Cominco, Kennecott, and others are pushing to fast-track the permitting process through the DNR, MPCA, the Army Corps of Engineers and US Forest Service offices in the hope that full scale production can begin, in some cases, as early as late 2008. Some of the proposed sites extend to within about a mile of the BWCAW.

Just south of Ely, Duluth Metals (a Canadian company) has already begun drilling core samples down 1300 ft. and more to pinpoint locations of the richer ore veins. Roads and clear-cut areas are fast appearing while 24/7 drilling, cutting and truck traffic is impacting the former tranquil lives of residents along the Spruce Road and the Kawishiwi Summer Homes Road. Officials claim 31 core drill holes will be put in on 24 sites and that no official proposal to mine has actually been requested.

Iron ore mining has been a part of the Ely area for over 100 years. But metallic sulfide mining is not iron ore mining. The

The newly industrialized countries of China and India are now driving this insatiable demand. How can we recycle, reduce consumption, reuse, or create greater efficiencies?

We should put forth a new sustainable, post-mining vision within our eco-region. Economic diversification and expansion of tourism should be our priorities, not disaster prone sulfide mining. With metro population expected to increase by 1 million over the next decade, we need to focus on northern Minnesota as a tourist area and as a source of food and sustainable forest products. Mining of the Duluth Complex will destroy \$4 billion in tourist trade.

The future is wide open. Why limit our vision? According to Gov. Pawlenty in his 2007 State of the State address, "We owe our children their own future not our past." Let's put a moratorium on destructive practices and open ourselves to new possibilities.

Elanne Palcich, NMW member and Act Now Coalition from Chisholm

sulfur-bearing ore body that contains the gold, copper and other desirable metals is considered a waste bi-product of the mining process and as such is placed in huge tailings piles for indefinite storage. Exposure to rain, snow or even air leads to the leaching of sulfur into the surrounding soil and water table. Sulfur dioxide is the result on the land and in the rivers and lakes. SO₂ kills fish and makes the environment uninhabitable. Examples of sulfur-contaminated mining sites abound in Wyoming, Montana, Idaho, Wisconsin, Michigan's Upper Peninsula and numerous operations around the world. In fact, there has never been a metallic sulfide mine that, despite rubber liners and other types of treatment, did not leak acidic materials. Trace amounts of heavy metals will end up in the waste piles as well.

NMW board members have attended meetings held by both pro-mining forces and those who oppose a reckless rush to mine. NMW does not oppose mining per se; we do oppose any mining activity that uses untested technology and could result in catastrophic environmental damage. In the case of sulfide mining, mining officials claim new but unproven technologies are the key to avoiding disaster. But these technological improvements are just that unproven. Should Minnesota and particularly the invaluable precious BWCAW watershed be the experimental laboratory for Wall Street investors? We think not!

NMW's role now is to continue to monitor developments of the various companies as they move toward the permitting process. We believe our federal and state officials bear a huge responsibility not just to us but to succeeding generations, a responsibility to scrutinize the data and to guarantee unqualified protection of our land, air and water. We are also working to expand awareness about the dangers of this type of mining. We have had educational booths at several regional festivals, fairs and conferences. We support groups such as the White Iron Chain of Lakes Association (WICOLA) *continued on back...*

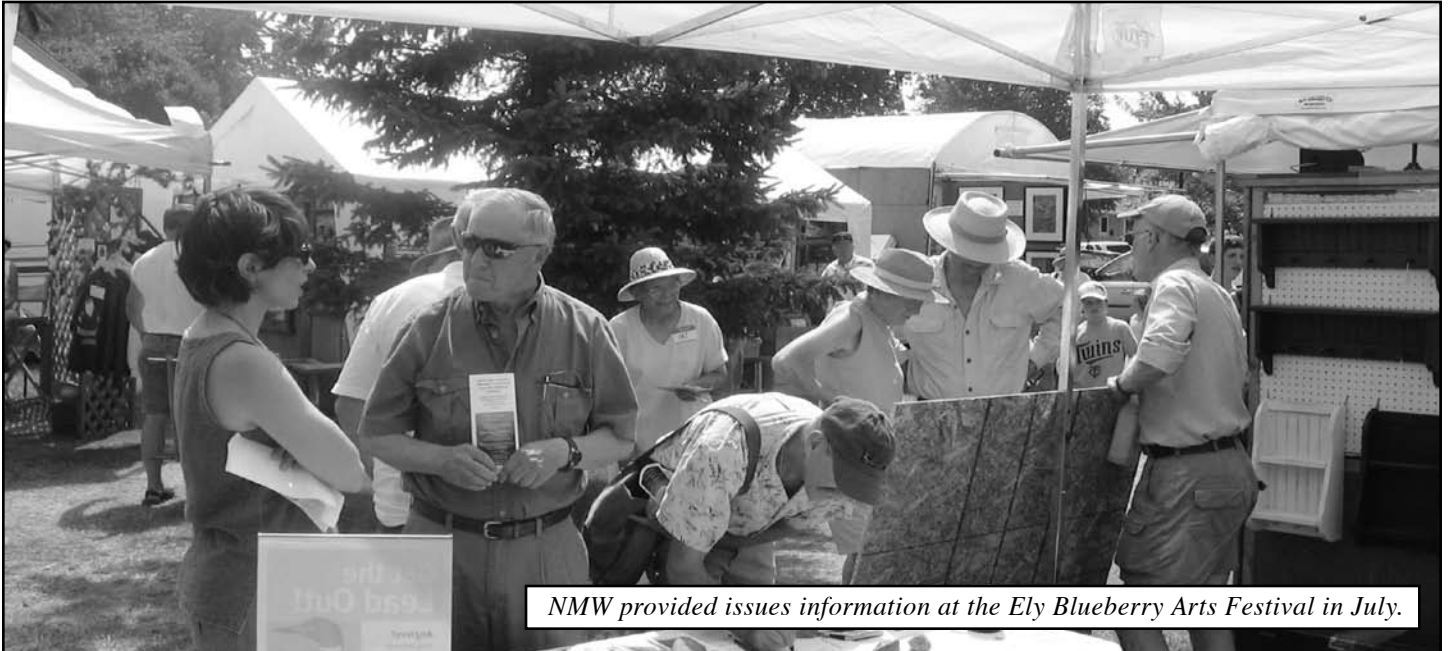
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as they develop a water quality base line on White Iron, Farm and Garden lakes (all just east of Ely). These lakes are downstream from the proposed mining activity and comprise the likely route through which any sulfur discharge would flow on its way into the BWCAW.

While the call for more and better-paying jobs on the Range

is legitimate and heartfelt, we must not allow it to override considered judgment. If a contaminated water table is the end result of corporate folly and government blindness, we will all have lost an immeasurably precious piece of the earth. This cannot be allowed to happen.

Will Hauser, NMW Board Member from Ely



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NMW Selects Student Essay for Publication

Angell Magliulo, NMW Vice-Chair

NMW was pleased to receive this spring from Professor Clayton Russell the essays on “Why Does Wilderness Matter?” submitted by his students at Northland College in Ashland. The NMW Board reviewed the essays and selected for our Newsletter, “Wilderness Matters” by Chad Lorenz.

NMW wishes to thank all the students who shared their insights with our board. We truly appreciated the opportunity

to read the views collected through personal recollections and to learn about the people and places that inspired them. These thoughtful interpretations stimulate us to reflect on how all of us have formed our understanding and appreciation of wild places.

NMW also thanks Professor Russell for submitting the essays and for writing the following introduction to the topic and to the essay selected for publication.

Why Does Wilderness Matter?

Prof. Clayton Russell, Northland College, Ashland, Wisconsin

Many of us have experienced the tangible aspects of wilderness. And many of us have been fortunate to experience the more intangible benefits of wilderness as well. All too often, when asked why we go to the wilderness, our answer seems incomplete. Our eyes light up as we remember the many aspects and adventures of our trip but the depth and meaning of the experience fails to make it into language.

The purpose of the course was to help those of us who have been out, to now go in. Going in allows us to immerse ourselves in an internal reflection on why wilderness matters to us and then to better prepare us to attempt to answer that question for our fellow humans.

In the Wilderness Writers and Philosophers class we read “The “Wilderness Act of 1964” along with the revealing biography of Howard Zahniser, Wilderness Forever by Mark

Harvey. This gives us a glimpse of what can be achieved by one hard working bureaucrat with excellent writing and people skills. We also read Wild Nevada in order to sample western wilderness issues and to get a sense of the contemporary wilderness vernacular and activism. We follow this with a tour through Jack Turner’s very provocative book, The Abstract Wild. This diverse grouping of essays prepares us for Max Oelschlaeger’s expansive and thought provoking work on The Idea of Wilderness.

The final class requirement is to answer the big so what question, why does wilderness matter. This is an opportunity to put into words the many ideas, feelings and experiences from both a semester of study and for some a multitude of wilderness experiences. The following essay by Chad Lorenz sheds light on the sense of immediacy and passion felt by the next generation of wilderness advocates.

Wilderness Matters

Chad Lorenz

“If you have to ask the question, you won’t understand the answer” (*A sign hanging in the Talkeetna Ranger Station, Alaska*)

We don’t need wilderness. There, I said it. Wilderness is a commodity, one we cannot afford. Besides, the needs of the people of this great nation are vastly more important than those of a few granola crunchers who would have you believe that this bird and that insect would lose some habitat in the process. That’s the way life goes. We move on. The progress of this country, the economy of the world’s greatest

state, should not come to a standstill over a rare mountain snail or endangered desert guppy. Their loss is lamentable, but as the great forester and conservationist Gifford Pinchot would say, we need the greatest good for the greatest number. Imagine how our quality of life would disappear if we couldn’t dispose of our nuclear toxins in some remote central location; parents would be afraid to allow their kids to leave the home or to let their dog drink from the pond.

This viewpoint, although an affront to the sense of decency among today’s preservation-minded individuals, is certainly

Wilderness Matters continued...

Chad Lorenz

not for off the mark for many people. Their entire conception of wilderness and wild nature is starkly defined and strictly controlled. Commodity corporations that have a vested interest in consumption pump billions of dollars each year into creating a hard-to-resist lifestyle that is bound to technology and consumerism for its very survival. As people become increasingly separated by the divide between “real life” and natural experience, our problem deepens. The thinly veiled attempts by mass media and marketers to influence our perceptions of people, places and things become so ingrained and at such a young age that a way of life based on what the companies espouse is nearly assured. But aren't they giving us what we want, what we ask for? Doesn't the consumer empower the market? Where wants and needs are blurred and disposable income abounds, marketers prey. More often than not, this cycle leads to endless and wanton commoditization and an abuse of natural resources in the last two hundred years the likes of which have never been seen before on earth.

Wilderness matters. Whether or not you agree with the politics, a simple grasp of closed ecological systems and a desire to continue life on earth, for ourselves and our grandchildren, necessitates change. There are far more eloquent and enlightened testimonials outlining the economic value presented by intact wetlands, large stands of old growth timber and self-sustaining fisheries. Far more prestigious scholars have attested to the spiritual value of acceptance and renewal in nature. These things are all benefits of wilderness to be sure, but we should all be able to grasp that at a deeper more primitive level, the human condition is a natural one, dependent on natural laws and systems for survival. Restated, we cannot escape the biologic, natural consequences of our actions.

And what if we couldn't mine for ore and other minerals? How could we get to work, use our hot tubs and eat fast food? What would happen to our power plants that support a comfortable life, the electric toothbrush and refrigerator with built in TV; what would become of these appliances that make life easier and more fun? I'd say that we don't need that superfluous wilderness. Our air is clear enough; I don't ever have trouble seeing around town through all of the pollution they claim is being released. And the water is certainly fine too; anyhow, water filters are cheap and when they get old you throw them away and buy a new one! No, it seems to me that the needs of our country and the needs of our citizens are clearly at peril should we designate additional wilderness. The wild lands have always been a playground for the rich and able-bodied people who have too much free time and not enough work ethic...

Wilderness provides an escape. It allows us to separate ourselves from the present and gaze into a prehistory rife with an unquestioned beauty and a seemingly unrestrained wildness about it. It doesn't take an able body to experience this, and even the idea that untrammelled places exist can quiet the mind and bring peace and order to the physically disabled or excitement to the armchair adventurer. Alighting in wild places and experiencing firsthand the fragility of our existence, we can begin to understand the grander processes at work that allowed our kind to flourish here and how delicate the line is that we must walk. Those “granola crunchers” pigeonholed earlier are no more or less intelligent or wise than you or I, but they are aware and concerned. They understand it is necessary to sway the tide of public opinion toward a more conscientious coexistence with the world around us. Awareness and concern, with a bit of alarmism thrown in for good measure, is only a stopgap. To truly stop the bleeding and heal the wound, we must begin to reverse the damage we have begun. This is where lifestyle choices and technologies come into play. It is imperative that we begin to diagnose and treat the influenza that afflicts us. A gradual shift in opinion and practice stands a far better chance of true change. But we must begin now, and we must begin bridging the rife that alienates and insulates us; we need to come down from our lofty perch and address the problems we are witnessing rather than pass them on to the next generation, before they lose hope. Wilderness matters.

Chad Lorenz is a junior studying Outdoor Education and History at Northland College in Ashland, Wisconsin.