

**Non-Metallic Mining and Processing in Dunn County
Environmental Impacts and Regulatory Analysis
With Recommendations to Improve Industry Oversight**

April 23, 2012

**Feedback and Questions on Dunn County's
"Environmental Impact Analysis and Regulatory Analysis
with Recommendations to Improve Oversight"**

Offered by Pilar Gerasimo
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May 16, 2012

INTRODUCTION

I would like to offer deep thanks to the County Staff and Board for their work studying and preparing initial recommendations on this important topic. Having read the document in its entirety, and researched a number of related issues in some depth over the past few weeks, I would like to offer a number of questions and suggestions.

I offer the following in the spirit of public input, and with the hope that by bringing my skills as a journalist and my perspectives both as concerned citizen and former Town Chairperson, I can lend support to your efforts.

While I am not an expert on any of the technical or regulatory issues addressed below, the questions and concerns I raise here are those I think might be representative of residents and taxpayers who, like me, are witnessing a great deal of rapid change in our area, and who want to make sure appropriate inquiry and deliberation go into the decisions that will affect not just us, but many future generations.

I am grateful for your time and consideration and wish you the best as you pursue the complex and challenging work of preparing our county for the influx of large-scale non-metallic mining developments in our area. If you would like additional copies of this document in printed or electronic form, I would be happy to supply them.

GENERAL FEEDBACK

Cumulative impacts: The potential total, cumulative impact of widespread non-metallic mining in our area is not much addressed in the current documents, but it seems of great importance and worth evaluating, perhaps with assistance from experts (environmental scientists, social scientists, economists) within the UW system or elsewhere.

There is a significant amount of literature suggesting that large-scale mining has dramatic (and often net-negative) effects on its host communities. With this in mind, has the County considered the possibility of limiting the total number of acres per mine, or how much land we feel is desirable (or acceptable) to dedicate to mining within the County or certain areas of the County?



Given our County's many other priorities and objectives, our long-term goals for the area, and the relatively limited projected future for the fracking boom (15 to 25 years is considered a max estimate by many; in January, the Energy Department cut its estimate of the amount of gas available in the Marcellus Shale by nearly 70 percent), it would seem unwise to create too much economic reliance, or justify too much permanent community sacrifice, in the name of this particular endeavor.

In considering cumulative impacts and trade-offs, it's also important to keep in mind that the fracking industry's recent growth (and resultant frac-sand rush) could soon be curtailed

by new restrictions and bans being considered in several states, including New York, Vermont and Pennsylvania. A variety of ceramic alternatives to natural sand (made from recycled glass, for example) are also being rapidly developed. Recent studies suggest that because of fugitive methane emissions from fracking wellheads and gas pipelines, the carbon footprint of natural gas may actually be higher than coal, making it a potential future target for regulation on that basis, too.

Finally, some recent reports also suggest that the current boom may be in part based on badly financed and deceptive (“ponzi-scheme”) land deals that could lead to a financial bust not unlike that associated with the mortgage crisis.

See <http://www.rollingstone.com/politics/news/the-big-fracking-bubble-the-scam-behind-the-gas-boom-20120301>).

A quote from that article, which was widely covered in the general press:

In recent years, the company [Chesapeake Energy, a leading natural gas developer] has also sold off the future proceeds it expects to receive from thousands of wells – a complex financing deal that enables it to borrow cash now without counting the debt it will owe when it has to drill the wells later.

The very first deal, made with Deutsche Bank and a Swiss investment firm, brought Chesapeake more than \$1 billion in return for 15 years of future production from 4,000 wells. "It's not illegal, but most gas and oil companies don't do it," says Bob Brackett, an analyst with Sanford C. Bernstein & Co. "Chesapeake's poor credit rating pushes them to turn to unconventional financing."

Also see this more recent news (March 16, 2012): **“Fracking Titan Chesapeake Energy in Stock Swoon Amid Cash Crunch”**

<http://business.time.com/2012/05/16/fracking-titan-chesapeake-energy-in-stock-plunge-amid-cash-crunch-fears/>

Ultimately, research suggests that there are real limitations to how long the fracking industry will enjoy unfettered growth, and also real limitations to how much sand, forest, and arable land we can allow to be removed from our area without widespread undesirable consequences.

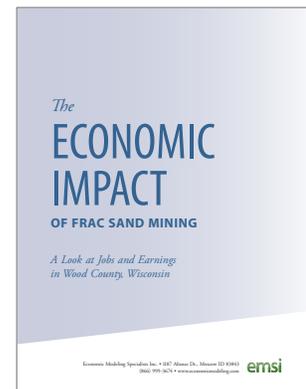
- Clear cutting of forested land, for example, can significantly affect ecosystems for many miles around a given site, and a large number of high-capacity wells in our area will almost certainly affect our shared aquifer and surface waters.
- Excavating of hills and sand could affect our entire watershed. The water-storage capacity of the land would be reduced. A widespread loss of wildlife habitat could provoke disruptions of animal populations, pushing them into residential areas.
- A shift to a mining-based economy could also dramatically affect population trends (who moves in, who moves out), with potential impacts to local businesses, workforces, education and public services, real estate, and so on.

These are complex considerations that require expert input and thoughtful analysis. I would suggest such recommendations be developed, or at least explored through anecdotal

evidence from other mined communities, before allowing a rapid influx of industrial mining here. A few special considerations:

Preservation of natural capital: Scientific studies demonstrate that these lands provide important “services” to our environment (soil production, erosion control, water filtration, oxygen creation, carbon sequestration, food-chain and biodiversity support) and to our quality of life (scenic beauty, connection to landscape, hunting and fishing, recreation). They also produce real economic value, both directly (timber, crops) and indirectly (attracting tourism, residential and new-business development, skilled and educated workforces).

Total economic impact. A great deal has been reported about the potential positive impacts of sand mining in our region. But there does not yet appear to have been any detailed study or modeling of likely *negative* economic impacts. This should be undertaken, so that an accurate picture of the potential economic gains *and losses* can be perceived by the public.



Consider, for example: impacts to land values; potential job losses; discouragement of new business creation or growth (as result of changes in environment or community character); lower residential development in some areas; impacts to tax base; tourism; loss of future agricultural products and timber stock; direct costs to private citizens as result of mining impacts (well testing; mitigation of noise, light and dust problems); healthcare costs; lost time in tracking and reporting of possible violations; as well as other quality-of-life considerations that could have secondary economic effects.

In other counties, such as Barron and Wood County, imbalanced and overstated reporting of mining’s positive economic impacts by the county’s Economic Development Corporations have skewed perceptions and prompted public mistrust and ill will. Dunn County can and should avoid this problem.

Weighing input from towns. Traditionally, in making rezone decisions, the County has relied heavily on the advisory recommendations of towns that fall under County Zoning. In the current “gold rush” environment, there may be a need for the County to exert more authority than has been customary and to demand more due diligence from towns in demonstrating the basis for their recommendations. There are two key reasons for this:

1) Unseen industry influence. Mining interests and land developers active in the area appear to be employing “railroading” and “divide and conquer” strategies in which they isolate one or more key influencers, such as town chairs, supervisors, or land plan commission members, and then attempt to influence these individuals via closed-door meetings (sometimes with promises of revenue, funding for legacy projects, and so on) and then look to these individuals to bring the rest of the board along in fast-tracking the project.

This fast-tracking may occur even in the face of public dissent, in absence of due diligence about the out-of-state company’s history, fiscal strength and

operational viability, and in conflict with the town's own Comprehensive Land Use Plan.

There is evidence some mining interests are also using similar strategies with property owners and adjacent neighbors. They may employ a variety of legal devices, including "cooperation agreements" that exchange cash for vocal support in getting necessary government approvals, and which feature "confidentiality clauses" strictly prohibiting residents from revealing they have signed any agreement at all. Taken together, these factors can create an appearance of public support that may be misleading.

In some cases, due to significant closed-door activity and a lack of opportunity for open public discussion, it appears local residents are not having their concerns fully represented by their elected officials, or even having their views fully considered. As a result, important questions that need to be considered about the long-term impacts of proposals may not get the attention they deserve. The county can be helpful in ensuring such proposals are more fully vetted and considered.

- 2) A need for broader perspective and oversight.** In many cases, the proposals and rezone requests being considered by individual towns have impacts well beyond their borders. A pending ag-to-industrial rezone request in the Town of Menomonie is a good example. It would permit a transload facility and rail-spur sited at the borders of Lucas and Knapp, and the proposed hauling route for this facility would significantly affect a half dozen other towns, including hundreds of residents, plus local business, school bus routes, parks and cemeteries. The County can leverage a broader, more objective perspective in assessing impacts not just to a given town but also to surrounding communities, and to the County as a whole.

Environmental indemnification/liability: It's been reported that some property owners have signed leases with "environmental indemnification clauses" that release the mining interest from any responsibility for damage discovered after mining has ceased.

Given the potential for slow-emerging, long-term and very large-scale problems with water and soil contamination, ecosystem impacts, etc., and the limited capacity of individual landowners to absorb associated costs, this could put the burden of clean-up on local, county and state governments.

Is there any action the County can take to put this potential liability back in the hands of the mining interests, by requiring larger financial assurances, for example, or by requiring evidence of appropriate lease terms?

DNR Regulations: There are many references throughout the County's document to what the Wisconsin Department of Natural Resources (DNR) is being counted on to protect and regulate, but in fact, most of the agency's regulations were not developed with this type of mining in mind. In many cases, they appear insufficient to accomplish the objectives the regulations themselves articulate (protecting water and public health, ensuring habitat is not unduly damaged, that land retains a valuable use, etc.). Also, recent reports suggest that

the current DNR (which has gone through a dramatic change in recent years) is not staffed or directed to enforce the regulations it has.

Given all this, it would be helpful to conduct a review of the intended protections within the DNR regulations and S. 295 and *then* consider what needs to be done at the county or local level in order to ensure these intentions are supported by practical actions. Presumably this will require more local and aggressive analysis, monitoring and enforcement at mining-interest expense, and may involve the funding and hiring of additional county staff positions.

Extension of moratorium. The question was raised at a recent PR&D meeting whether an extension of the current County moratorium could be extended by a few months. Counsel suggested this might be a possibility. Give the scope of the open issues and questions, and the need for additional time by County Staff, third parties and board members to address those questions and establish appropriate standards and procedures, such an extension seems essential.

The County is clearly making a good-faith effort in developing important regulatory and process tools, and to rush that work at this juncture, simply to meet an arbitrary deadline set before the scope of such work was fully assessed, would run counter to the original intentions of the moratorium.

FEEDBACK ON SPECIFIC SECTIONS OF COUNTY "RECOMMENDATIONS" DOCUMENT

3.1 Mining

"Effective reclamation" — is this defined anywhere? In S. 295, the basis, scope and intentions of the administrative code are articulated. Given limitations of NR 135, perhaps it is good to consider and express those broader intentions within the county's zoning ordinance, particularly in light of the current context (widespread siting of non-metallic mines in ag and ag-residential areas, impact on watershed, etc.).

Special precautions must be taken to protect air, water and soil, and given the economic value of the resource being exploited, perhaps setting a higher standard for reclamation is appropriate, too.

Current NR135 reclamation plans do not seem to produce high-quality results or high-value land use for future generations. The county's current administrative approach to NR135 also does not seem adequate for the current situation. To accomplish the stated aim of "effective" reclamation, the county will require a more regulatory framework and perhaps a more aggressive staffing strategy.

3.2 Requirements. Is it clear who will enforce these requirements, or inspect to ensure they are being done consistently and properly? Seems like a job for a third party hired at the mining company's expense.

Also, are we going to define any of the requirements in more detail? Take 3.2.b.5, for example: "Any water disposed of must be done so in a manner that will not adversely affect any surrounding property owners."

The current NR135 code also states, “Wash water may be reused or discharged after washing to the ground surface, or surface waters depending on the volume and design of the operation.” This could allow a given operation to discharge something like a half million gallons a day (6% of waters used, or “spillage”) onto the ground or directly into surface waters. Additional water could presumably leach or run off stockpiled product and waste sand.

If this is true, then the requirement under 3.2.b.5 seems inadequately described and difficult to enforce.

Will there be frequent well testing and monitoring performed at mining company expense? If a complaint is lodged, who will handle? How will fault and consequences be determined? Will neighbors be notified of violations? It seems that more study of potential impacts and mitigations is necessary.

3.3 Impacts Under Other Jurisdictions. Many of the factors listed in this section bring up the same problem noted above: How will the regulations be *administered and coordinated*, given high potential for ground water impacts, potentially stemming from a large number of sites.

One important requirement that appears to be missing from this section, and that I didn’t see elsewhere in the document (perhaps it exists elsewhere?):

The county should require, in advance of permitting, a detailed listing and study of *all* chemicals proposed for use in each stage of processing (not just flocculents, but also acids, salts, minerals, etc.), including:

- chemical formulation data
- potential hazards (MDS data?)
- intended function
- potential interactions with other chemicals and organic compounds
- acceptable dosage limits
- demonstrated (not estimated) rate of chemical breakdown in proposed environment
- effect on water pH, and more

It would be helpful if the county also required that a detailed listing of all chemicals stocked and used by mining operations be made publically available.

Intended dosages and concentrations should be specified, and third-party testing and reporting of on-site water and sediments (for active acrylamide levels, polyacrylamide breakdown rates, alkalinity, heavy metals, etc.) should be carried out both prior to operations beginning, *and* on an ongoing basis *using controlled study environments*. Regular site inspections (at operator expense) should confirm proposed usage standards are being observed.

We should test, not assume, the safety and adequate breakdown of flocculents and other substances based on real-life conditions. Fish kills have been observed when waters from

mines have reached surface waters and acrylamide or heavy metal residues in water or sediments could pose a significant threat to our aquifer and human health over time.

See: <http://www.wmbfnews.com/story/17859801/horry-county-experts-have-answer-to-mysterious-fish-kill>

A quote from that story:

HORRY COUNTY, SC (WMBF) Horry County Watershed Planner Dave Fuss tells WMBF News low pH-water from a mining project is seeping into a man's pond and killing hundreds of fish.

The conclusions come from water samples taken at William Edge's pond on his property off Highway 544 and the Robert O. Collins sand mine nearby. Fuss says the tests show the water samples are consistent in both places.



Justin Harris, operations director for Robert O. Collins, says the company is working with the Department of Environmental Control to come up with a long-term solution, but for now the mine is not pumping any water.

DHEC permits and monitors mining sites to make sure any discharges are safe. Officials there say they're looking into this incident.

4.1. Highway/Traffic

Will traffic impact analysis include the impact of the likely shifting of residential and commercial traffic away from over-congested and potentially dangerous hauling routes onto alternative county and town roads?

Can impacts to local driveways and intersections be carried out, or recommended for residents, farmers and businesses on affected State roads?

Some communities have seen the questionable removal of stop signs to accommodate frac-sand truck traffic, or have had difficulty getting their Town officials to request no-engine-breaking signs for residential areas. Is this something the County can help facilitate?

4.2. Health

Heavy metals. Important item not addressed in current document: Heavy metals naturally present in the ground get stirred up during land disruption. Lead, arsenic, mercury and other potentially dangerous compounds may be released when land is disturbed, and sediments from rock and sand will likely become concentrated into sludges or slurries that may be leached or released into ground and surface waters.

As noted above, this will dramatically increase the potential for human health risks (particularly to children) as well as danger to aquatic life.

The Town of Howard has seen elevated lead levels in relation to increased non-metallic mining activity. The county should closely assess, monitor and mitigate this danger whenever possible.

Stress-related health impacts: I did not see this consideration addressed within the current document, and I would suggest that it should be.

Increased stress is virtually inevitable as the result of the public's experience of mining-related disruptions both to their natural environments and social communities.

- It is widely estimated that stress-related health issues account for 85% of all doctors-office visits, playing a scientifically demonstrated role in complaints ranging from headaches and back aches to digestive disorders, mood disorders, sleep loss (more on that in a moment) and serious inflammatory illnesses like diabetes, heart disease and cancer.
- Stress releases a cascade of pro-inflammatory chemicals (such as adrenaline and cortisol) in the body, and can result in secondary effects like imbalanced blood sugar, hormones and neurotransmitters. Stress also plays a significant role in weight gain, which in turn is a demonstrated causal factor in many of the chronic health conditions listed above.
- The presence of disruptive, industrial activities in residential and agricultural environments, the witnessing of loss of familiar landscapes, and the incidence of community conflicts between neighbors will inevitably lead to increased burdens of stress among residents, which will in turn provoke an uptick in a variety of disease states and health risks. This will lead to a rise in associated public and private health costs and increased need for healthcare services.
- Additionally, the biochemical impacts of stress must be considered *in relation* to the increased presence of other mining-related health factors, like airborne silica dust, potential exposure to toxins, and so on.

I would suggest that the county seek an outside study of such impacts, and consider them as particularly important factors as they weigh "incompatible land uses" in mining-related rezone decisions.

Sleep loss: Decisions about mining-related industrial development should include potential health risks associated with the potential for sleep disruption, known to be a critical factor in general health, metabolism, mood, immunity and healing.

- Increases in health problems and health risks triggered by stress and toxic exposure could be dramatically compounded by reductions in sleep quantity or quality.
- The noise, light and traffic associated with industrial mining activities will likely have a significant impact on the sleep of hundreds or even thousands of individuals who live nearby mining sites or on their truck hauling and rail routes.

Baseline analysis of public health statistics should be undertaken so that impacts to health can be documented and evaluated over time. Additionally, proactive measures to minimize negative impacts on sleep and stress should be emphasized throughout the county's recommendations.

4.2.3 Well monitoring. Testing should include analysis of heavy metals, flocculents, acid-alkaline balance, and any byproducts of chemicals used in mining, as well as any chemical compounds of potentially synergetic significance, including agricultural residues.

Overall, the County's recommendations would benefit from more health-related discussion of proper handling and ongoing testing/monitoring of toxic industrial sludge and slurries.

Flocculents

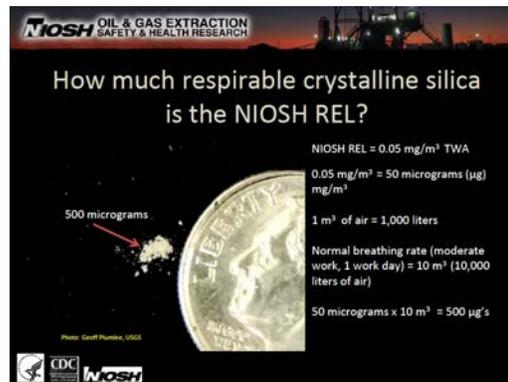
4.2.4 The higher grade flocculents used in municipal water treatment *are* less dangerous (thanks to lower levels of acrylamides) but still require regular testing to ensure safety in real-life environments — as opposed to the carefully contained and controlled environment of water treatment plants.

It is not clear how compounded impacts of flocculent exposure along with increased heavy metal exposure (with potential resultant neurotoxic, carcinogenic, immune depressant and epigenetic effects) might impact human health. These combined factors could present particular dangers for young children, pregnant women and developing fetuses.

4.2.5 Fugitive dust control. Given that the DNR has acknowledged the health risks associated with fresh silica dust, I think this section deserves more exploration. Current conventional "industry best practices" may simply not be adequate for the current untested exposure scenarios.

For more info in this, see the DNR's 2010 report, which says:

"Crystalline forms of silica, such as quartz, meet the requirements for listing as a known carcinogenic hazardous air pollutant (HAP)1 as defined in Wisconsin's Air Toxics Rule, Ch. NR 445, Wis. Admin. Code."



Report available at:

<http://dnr.wi.gov/air/pdf/DraftForPublicComment-SilicaStudyStatusReport.pdf>

Also see this article:

<http://www.wisconsinwatch.org/2011/07/31/sand-mining-surges-in-wisconsin>

Fugitive dust could pose a significant risk not just for silicosis and lung cancers but also for respiratory problems like allergies and asthma, particularly when combined with additional air-quality factors like increased exposure to diesel fumes and other particulate matter from mine operations and hauling routes.

The topic certainly deserves further study and analysis by EPA, and in the meantime, we need specific recommendations for appropriate testing and monitoring of air quality in inhabited or frequently traveled areas. In the absence of definitive studies, we should take a precautionary stance that extends beyond industry practice.

Until we have established with certainty that fugitive dust does *not* pose a health threat within a particular operating and site scenario, the County should consult with a qualified industrial hygienist (consider Eugene Ruenger, PhD, Chemistry Professor at UW Stout and a former consultant to 3M?) for recommendations, then insist that the best available technologies (such as an array of respirable-dust monitors placed at several locations on site) and aggressive monitoring standards be put in place.

This, combined with initial baseline testing, should be done at operator expense and managed by a third party that bills and reports directly to the County. If initial testing (say, over a five-year period) suggests that the potential for danger is limited, regulatory standards can be adjusted accordingly.

4.3 Land Conservation/Reclamation

I am not aware of any convincing evidence that conventional attempts at mine reclamation for agricultural or woodland have ever been very successful in this area, despite adherence to the guidelines recommended in this section.



Disrupted and compacted soils simply do not perform the way undisrupted ones do. Drainage factors, micro-organisms and ecosystem factors that affect soil fertility do not ever fully recover, and attempts to grow anything other than grass and scrub trees or invasive species have proven largely unsuccessful in most environments.

For insight on how well reclamation worked on formerly wooded sites in West Virginia, see: <http://www.ohvec.org/galleries/reclamation/index.html>

According to the American Farmland Trust, Wisconsin currently loses more than 30,000 acres of farmland a year to residential and industrial development, and its working forests are being undermined by fragmentation. Our state also loses topsoil to erosion from wind and water runoff, both of which could be affected by clear cutting and mining.

Given this, and the critical implications balanced land use has for our agriculturally rich and biologically diverse region, more thought must be given to the regional impacts presented by permanent loss of productive wooded and fertile land for proposed mining purposes.

Unless it has a convincing body of evidence to the contrary, the County should challenge assumptions and implications that mined land can be successfully returned to cropland or woodland using current NR135 standards, and require alternative beneficial purposes to be planned for land damaged and lost to mining.

If it cannot demand more restrictive guidelines than NR135, the County could still recommend Towns adopt such standards within their non-metallic mining ordinances, and specify reclamation recommendation standards for types of trees and species of plants desired for replanting.

4.3.2.2 Under what circumstances would the County want to consider Expedited Plan Review, or any type of expedited treatment? In whose interest would this be?

Given constraints on staff, the need for public awareness and input, and the importance of ensuring full procedural rigor, this seems like a questionable option to offer.

4.3.2.7 “Require a ground water protection component for non-metallic mining reclamation plans where mining in ground water is proposed.” Elsewhere in document, mining in ground water, or within 10 feet of ground water, is said to be prohibited. Suggest correcting inconsistency in this section.

4.3.2.8 “Prohibit haul back material or processing waste from being placed in areas susceptible to ground water contamination.” How will this be defined, and how will it be regulated, inspected and enforced?

Waste material should be placed in lined pits and the removed sediments tested over time at various layered depths to assess rates of breakdown with time and exposure to air and light.

Sediments from each operation should also be tested to ensure that chemical flocculents/additives have been *proven* to safely biodegrade in a given scenario, and that heavy metals are not present in high concentrations, *before* being returned to raw land.

More testing of this whole process is necessary before assumptions of safety can be made, and what is required in order to achieve optimal biodegradation standards.

4.4. Planning

4.4.1. Environmental corridors: Great idea. Important idea. How would they be identified, and by whom? Consider “scenic vista protection,” too.

As noted, this land already has significant value as is — including “natural capital” and “ecosystem service” values, as well as tourism-based values — that likely exceed the total mining value of the property.

Recently, the journal *Science* published a report estimating how much it would cost in real dollars to replicate key ecosystem services on a global level. The amount was a staggering \$30 to \$40 trillion per year (approximately equivalent to the total Gross Planetary Product). Here’s a list of services the report considered:

- purification of air and water
- mitigation of floods and droughts
- detoxification and decomposition of wastes
- generation and renewal of soil and soil fertility
- pollination of crops and natural vegetation
- control of agricultural pests
- dispersal of seeds and nutrients
- maintenance of biodiversity

- protection from ultraviolet rays
- stabilization of climate
- moderation of temperature extremes
- moderation of the force of winds and waves
- beauty and spiritual sustenance

The beauty and appeal of the natural environment is a primary reason many residents moved to the area or decided not to leave, even in the face of financial challenges. It is frequently listed as a key value and priority by residents surveyed during Comprehensive Planning throughout the region.

For more on this topic, see *Outside* magazine's 2005 article "**As a Matter of Fact, Money Does Grow on Trees**":

<http://www.outsideonline.com/outdoor-adventure/As-a-Matter-of-Fact--Money-Does-Grow-on-Trees.html>

Also see *Time* Magazine 2011 article "**Paying for Nature**":

<http://www.time.com/time/magazine/article/0,9171,2048324,00.html>.

Quote from article:

"Conserving the upstream land is a cheaper way of protecting downstream water quality than building costly treatment plants. New York City did this in the 1990s, purchasing or protecting over 70,000 acres (28,000 hectares) of its watershed upstate to avoid the need for a \$6 billion treatment plant ..."

Dow donated \$1.5 million through its charitable foundation to support a joint effort with TNC and São Paulo water utilities to restore 865 acres (350 hectares) of forest surrounding the Cachoeira reservoir. Not only will that money protect biodiversity, generate carbon credits and create green jobs for locals living near Cachoeira, but it should also cut the amount of sediment flowing into the water system by over 60%."

4.4.4 "Areas susceptible to ground water contamination." Given presence of porous sandstone throughout our area, is there any place *not* susceptible? What will be the basis for identifying these areas? Soils and recharge rates? Other?

Can testing and environmental impact studies be done prior to siting? Can ongoing testing (by drill bore) be considered to evaluate migration of toxic substances?

4.4.5. How will this affect Town's comprehensive plans?

4.4.6. Consider the possible impact of more passenger and commercial traffic on alternate routes as a result of overcrowding on state highways. Require mining companies to pay for building bike lanes on alternate routes? Address sand on roads as danger to bikes and motorcycles. Fees/fines for sand spillage onto roads.

4.4.7. See article in *Silent Sports* magazine: "**Sand Mines Grating to Cyclists: Truck traffic, dust and a marred landscape raise concerns**"

<http://www.silentports.net/leadstories/sand-mines-grating-to-cyclists-jcpg-265832-149643135.html>

Quote from article:

The rapid proliferation of sand mining operations in western Wisconsin and southeast Minnesota have recreationalists worried. Bicycling events set in the rolling countryside are increasingly popular, but participants may be turned off by the sand mines marring the landscape.

Event organizer and retired University of Wisconsin-Stout Vice Chancellor David Williams shared his concerns about the increasing amount of sand mining in the Menomonie, Wisconsin, area. "We work to encourage bike tourism in Menomonie. Now there is a proposed sand mine on our bike race course at Knapp Hills" to the northwest of Menomonie.



"This whole thing needs to slow down," Williams continued. "We need to know the environmental and tourism impacts before we get too far down this path. A couple years ago there was virtually no sand mining in the area, and now there are several big mines with more being planned."

According to Williams, some bike courses are being re-routed due to road damage caused by heavy traffic to and from mining sites.

4.5 Zoning

4.5.2 Consider expanding area for collecting baseline data well beyond ½ mile. Water travels underground at something like 4 miles an hour, so baselines beyond a small perimeter will be essential. Mining company should pay for third-party testing within several miles.

Also, keep in mind that it will be very difficult to prove the source of contamination as originating from a particular mining operation if more than one mine is active in region, which will make baseline numbers in a broader radius even more important in tracking origins of contaminants. The burden of proof will fall on property owners.

4.5.1.3 Always a good idea to retain maximum vegetation on site for the purposes of buffering sound and dust, and minimizing erosion. Also good to encourage responsible forestry practices (vs. bulldozing, heaping, chipping or burning useful timber and forest materials). Not sure it will be deemed practical or efficient by mine operators, in many cases. For this reason, careful consideration should be given to whether certain proposed clear-cuts *can be accommodated* without negatively affecting watershed, wildlife habitats, and surrounding properties. Again, *cumulative* impacts to watershed, community and wildlife should be considered.

4.5.1.3 There are currently technologies that can practically assess respirable fugitive silica dust particles. They are expensive (reportedly about \$10K per monitor) and it would require several monitors per site to assess the carriage of dust by wind patterns, etc. But those costs can and should be borne by the mine operators, and installed and monitored by third parties at their expense.

Unless the County compels mine operators to comply with testing of airborne particles less than 10 microns in size (generally regarded as the most dangerous and mobile material), the population surrounding active mining, processing and transportation hubs will be serving as guinea pigs.

There is not, as far we know, any precedent for widespread exposure of a general, residential population to this particular type of dust over a long period of time. We simply do not know and cannot predict the impacts on children and older people for example, and it is widely known that it generally takes decades for silica-related illnesses to develop.

What is the county's strategy for addressing these sorts of liabilities and protecting public health in the face of a known carcinogen? The fact that the DNR has declined to study the matter should not be taken as a demonstration of safety.

4.5.1.5 Consider compounded impacts of multiple operations in a given region to affect surface water and wells. What happens when two or more such operations begin producing at capacity, and this coincides with a period of drought? Keep in mind that increased incidence of Midwestern droughts is widely expected among hydrology experts as a result of climate change.

See drought data at:

http://droughtmonitor.unl.edu/DM_midwest.htm

<http://journals.ametsoc.org/doi/pdf/10.1175/jhm-386.1>

4.5.1.7 Pre-application meetings and plat reviews should *actively include* key representatives of all affected towns as early as possible in the process, not just require their sign-off as being aware of the proposed project. Also, can opportunities for public awareness and input be moved earlier in the process?

The current impression among many residents is that by the time public hearings are held, most decisions have already been made and they have little opportunity to influence the process. Although this sounds like an administrative matter and may be an elective decision for the Zoning department, it's important to recognize that it has significant practical and political implications for the broader community, and will help set a tone of inclusion and open communication that is in all stakeholders' long-term best interests.

4.5.1.8 Responsible logging and forestry practices are important, and preferable to reckless practices, even when clear-cutting is unavoidable. But there's also a broader view that must be considered in light of the potential for widespread clear-cutting and damage to forested lands as the result of mining projects.

We must keep in mind that it took 12,000 years of geology to create the soils that allow the

current high-quality hardwood trees to grow and to produce a forest that is harvestable. Timbers present in our current forests can be sustainably harvested every 15 years or so, a meaningful source of revenue and productive value that cannot be replaced by any post-mining reclamation strategy.

Proposed reclamation to “woodland” is rarely attempted in this region, because it has not generally proven successful. In other regions, it has mostly produced scrub and pulp trees, and in other areas of the country, it has required reliance on invasive species in order to achieve required ground cover.

Widespread erosion, soil loss, watershed and wildlife impacts as the result of tree removal should also be considered in economic and environmental-impact analyses.

See: “**Forests Worth More Alive Than Dead**”

http://www.ohvec.org/links/news/archive/2006/fair_use/09_28.html

Quote from article:

BROOKLIN, Canada, Sep 27 (IPS) - Boreal forests provide 250 billion dollars a year in ecosystem services like reducing atmospheric carbon and water filtration, but which have gone unacknowledged by governments and industry, experts say.

Governments need to begin accounting for those services before allowing timber, oil and gas and mining to carve up the world’s remaining northern forests, argues the Edmonton, Canada-based ecological economist Mark Anielski.



While efforts gain momentum to preserve existing Canadian forests, the U.S. could offset nearly 20 percent of its current emissions of CO2 by turning marginal farmland into forests.

An estimated 115 million acres of land in the lower United States that is poor for agriculture but good for growing trees could store enough carbon to reduce the country's current emissions of 7.075 billion metric tonnes by nearly 20 percent, according to the report “Agricultural and Forestlands: U.S. Carbon Policy Strategies” released recently by the Pew Centre on Global Climate Change.

4.5.1.10 Non-metallic mining overlay district. Presumably, this works in conjunction with environmental corridors to identify some areas in the county that are more suitable (or less unsuitable) than others for industrial scale non-metallic mining, and to impose a new layer of requirements on zoning decisions made in this region. Is there more information available about the concept of the overlay district and how it works?

4.5.2.1 Lined settling ponds are a good idea, as they will reduce the likelihood of still-active flocculents soaking into soil and ground water. But expert input will be required to define the types of linings and operational standards for managing the ponds.

The sediments from these ponds will need to be periodically removed and either transported to a solid waste facility or spread on site. Because of the potential for toxicity, and because the proper breakdown of polyacrylamide flocculents rely on exposure to oxygen and sunlight for proper degradation, sludge “cake” and slurries from these ponds should *not* be buried on site or injected into wells, or released into surface waters. Rather, they should be distributed on an impermeable surface where their rate of breakdown can be evaluated and confirmed before returning material to the landscape. Testing for heavy metals should also be required.

It would be wise, rather than make assumptions about how fast these chemicals break down, to test the activity of the chemicals in a real-life setting. A third party could be hired, at mining operator expense, to assess both degradation rates and potential migration through various depths of sand, soils and clays with various environmental variables in play.

Until this can be tested and confirmed, no assumptions should be made based on how flocculents behave in controlled environments such as water treatment plants, because the two settings are inherently different, as are dosages and potential interactions with other unpredictable chemical compounds (including, but not limited to, the presence of farm runoff).

4.5.2.4. Operating hours are one of the most significant factors in how well industrial operations will be tolerated in residential and commercial areas. Although the commitment to prohibiting 24 hour operations is commendable, the county might consider a more stringent limitation in order to accommodate high-priority hours after 6 PM, as this is the time people return from work to have dinner, enjoy outdoor activities and enjoy open-window and porch time with their families. Consider limiting hours from 7AM to 6PM.

IMPORTANT: Regulations in these and all other sections should be made to expressly apply not just to mining operations, but to all mine-related infrastructure, including processing plants and transload facilities.

4.5.2.5. Property values. Research for the Centre for Spatial Economics produced an extensive analysis of many studies done on the impacts of quarrying and similar industrial mining activities on nearby property values.

It can be found here:

http://www.town.caledon.on.ca/contentc/townhall/departments/planningdevelopment/Schedule_B_to_CA0_Report_2009-001.pdf

Quote from a report on that study and related research, “**Property Value Losses from Quarrying Operations**”:

“CONCLUSION: Properties closest to the gravel mine faced the largest value declines, and property value declines diminished with distance from the mine.

It is important to note that these impacts are permanent. While it is true that properties within these ranges will increase in value in the future in line with increases in average property values in general in the broader area, it is equally true that the gap in values resulting from the negative impact of the quarry persists over time. Dr. Hite’s further studies have shown that these drops in value are true regardless of the type of quarry.

The analysis concludes: “*The chance of a gravel mine not having an adverse effect on housing values is one in one thousand.*”

Property values should be assessed based on pre-rezone, pre-mine or other mine-infrastructure status (existing conditions) within a three-mile radius of proposed project, then reassessed for post-mine value. Mining company should be obligated to buy out any property owner who desires at original market value, or compensate them for difference in property value, whichever they prefer.

4.5.2.6 Complete environmental assessment worksheet. Seems like this is critical and must be done by objective third party, prior to consideration of rezone. Does this worksheet already exist? Are we using it or something similar to evaluate impact of existing operations? If not, why not?

Clearly, as cumulative impacts of multiple sites add up, the estimated impacts could be exponentially higher (for example, multiply the potential discharge into a given stream by 2 to 4 mines, knowing that even a single digit percentage increase in turbidity or toxicity could result in aquatic fatalities).

4.5.2.11 Water

No mining within 10 feet of ground water. Important, and given porosity of sandstone, it should perhaps be a bigger barrier.

(Again, note that elsewhere in the County’s recommendation document there’s a reference to mining in ground water (4.3.2.7), which clearly should be prohibited. Important to correct this inconsistency within paper.)

At end of this section, paragraph following the one above, there’s a reference to Site Operations plan and a notation that “depending on type of permit application, it may not be required to submit these documents to the town or county involved.” Required by whom, currently? Agreed that this *should* be required somewhere that towns and county’s are guaranteed visibility as early as possible in application process.

4.5.3 Additional requirements for BOA Special Exception

4.5.3.1. Limit mining in areas with high susceptibility to ground water contamination.

Based on what info and what level of exposure? Reasonably, given porous geology and hydrology of area, and scale of proposed mining, virtually all our land could fall into this category.

Will surface water susceptibility also be considered? A recent spill from a sand mine in Grantsburg sent sediment into a local stream and then into the St. Croix River (see picture at right).

One thing not currently addressed: The sand in our hills and fields acts as a reservoir for water. When this sand is removed, so is an



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important aspect of our ground-water storage and filtration. It seems like this should be assessed and considered.

5.0 Glossary: I would suggest that the glossary section be reviewed and amended by outside experts for accuracy and scope. In particular, the sections on acrylamide and polyacrylamide could use some clarification and cross-checking, and the section on resins could use expansion.

There is currently no detail in this section about what proppant resins are made of (a quick search of industry literature suggests it could be novolac resins, epoxy resins, resole resins, phenol-aldehyde resins, urea-aldehyde resins, furfuryl alcohol resins, melamine resins, polyester resins, alkyl resins, phenol-formaldehyde polymers, etc.). Nor is there any mention made of associated potential dangers, for example, from VOCs, chemical-laced dust or spills that could occur during processing.

Also, not sure what the asterisks in some sections of glossary are meant to indicate.

6.0 Environmental Impacts

What is significance of underlining in this section?

6.2.2.2 “It is uncommon for fugitive dust to escape off site except during periods of strong winds and dry conditions” What is the source for this info? Is there reliable data to support it? Worth noting, I think, is that strong winds and dry conditions are regular occurrences in this climate, and particularly at mine sites with little surrounding vegetation. Observable dust is evident at many mine sites in the area on a regular basis, and it has been reported that the super-fine invisible dust (the most dangerous stuff) can travel for many miles.



Sand Processing Plants: Not seeing these addressed specifically in this section. Have all potential air- and water-quality dangers with regard to washing, drying and resin coating sand (including VOCs) at these plants been addressed?

6.3 Water resources. Many concerns have been noted elsewhere in this document. A few that deserve more attention:

- Water discharge onto ground or into surface waters presents a variety of problems; how will these be mitigated?
- Requirements for handling and disposal of “fines” and slurries or sludge containing them should be specified.
- Need for testing leaching water from stockpiles for heavy metals?
- Potential of material to travel into waterways quite distant from site should be addressed.

- “Process waters may not be discharged into any well or hole whose depth is greater than its largest surface dimension”... How is this a helpful control?
- “All high capacity wells are routinely screened for potential impacts” ... by whom, and how often, and how are results reported?
- The DNR recommends private well owners establish baseline information on static water levels and water quality parameters ... could cost hundreds of dollars; cost should be covered by applicant within a 5 mile radius of mine, and should include baseline testing for minerals, chemicals, heavy metals, turbidity, pH balance, bacteria, etc.
- “Generalized maps have presented misleading evidence of ground-water elevation” ... What is remedy or provision to handle this?
- Installation of monitoring wells “could” be used ... why not *require* their use?
- Notation of heavy metals already present in water supply suggests great potential for more to be released during mining.

6.3.1.2 Dewatering

“If sand mining operations are performed below water table ...” This would be prohibited by recommended guidelines elsewhere in the document.

6.3.2 Surface Water Resources

“Impacts to Wisconsin surface water resources are possible.” This conclusion seems an evident understatement. Are there any recommendations forthcoming to reduce probable and inevitable impacts?

6.3.3 Wetlands

Comment above applies here, too.

6.3.4.1 Storm Water

The 10-year weather events of the past may not predict unprecedented weather events occurring now.

6.3.4.2 Limited DNR site inspections noted (current estimates suggest they will occur at most every 2 to 5 years). Suggest specifying not just that County *could* pursue much more frequent inspections by third parties, but that it will.

6.4 Fishery Impacts

What steps will be taken to minimize and monitor impacts, and by whom will they be enforced?

Have fiscal consequences of potential fishery impacts been considered? Trout Unlimited (www.wisconsintu.org) reports: *Trout fishing in Wisconsin has a multi-billion dollar impact to the economy of the State, and supports thousands of small business jobs at gas stations, convenience stores, motels, restaurants, sport shops, clothing and souvenir stores. Wisconsin is the second most popular fishing destination in the country, trailing only Florida in non-resident fishing license sales.*

6.5 Solid Waste

Notation that non-metallic fines are a waste product. Recommendations on how these wastes, which can be returned to the site, should be tested for toxicity and handled to minimize threats to water, soil, health?

6.6 Recreation and Managed Lands

Great that concerns were raised about Nature-Based Outdoor Activities and impacts to same. Again, if this document is amended, it would be great to see some *specific recommendations* for limiting noise, dust, lighting and traffic impacts and for preserving and buffering key areas popularly used for outdoor recreational purposes.

6.6.3 Forests

Experts generally agree that diverse forest ecosystems do not return to clear-cut, mined areas. Suggest amending this section with more detail and reflecting more likely reclamation scenarios (forest to grassland or passive recreation, for example). As noted elsewhere, taking productive forestland out of rotation will have a number of negative environmental and economic impacts that will not be easily mitigated by existing reclamation strategies.

We should also assess loss of forest as it impacts other elements of the broader ecosystem.

Consider this study on how taking a forest and converting it to “reclaimed” mine land alters the entire ecosystem and watershed for several miles around the the area:

“Forest to Reclaimed Mine Land Use Change Leads to Altered Ecosystem Structure And Function”

<http://www.esajournals.org/doi/abs/10.1890/07-1117.1>

Quote from the article:

“The goal of this study was to quantify the changes to ecosystem structure and function associated with a conversion from forest to reclaimed mine grassland by comparing a small watershed containing a 15-year-old reclaimed mine with a forested, reference watershed in western Maryland.

Major differences were apparent between the two watersheds in terms of biogeochemistry. Total C, N, and P pools were all substantially lower at the mined site, mainly due to the removal of woody biomass but also, in the case of P, to reductions in soil pools. Mineral soil C, N, and P pools were 96%, 79%, and 69% of native soils, respectively. Although annual runoff from the watersheds was similar, the mined watershed exhibited taller, narrower storm peaks as a result of a higher soil bulk density and decreased infiltration rates.

*Stream export of N was much lower in the mined watershed due to lower net nitrification rates and nitrate concentrations in soil. However, stream export of sediment and P and summer stream temperature were much higher. Stream leaf decomposition was reduced and macroinvertebrate community structure was altered as a result of these changes to the stream environment. **This land use change leads to substantial, long-term changes in ecosystem capital and function.***



6.9 Socioeconomic Impacts

This section currently includes three brief bullets (two of which relate to possible reclamation scenarios) and does not include a full or detailed assessment of the impacts in question. Can this be expanded with the help of an economist well versed in the socioeconomic impacts (there are a vast variety) commonly seen in mining communities?

6.10 Transportation analysis

“Most of the processing facilities are being located near or adjacent to existing rail lines.” Mines are located in far-flung areas, though, and hauling routes can be dozens of miles long.

6.10.2 Acrylamide

As noted elsewhere, this item deserves more and closer study, with input from qualified and unbiased scientific experts based on on-the-ground conditions where polyacrylamides will be used.

Statements like “It does appear that acrylamide is biodegradable in aerated soils” may be misleading if we aren’t sure whether the sediments and waters that contain the acrylamides will in fact be placed in a well-aerated soil environment.

Same problem with the statement “Unless polyacrylamide levels are very high, there may not be a great potential for acrylamide to contaminate ground water” We do not know (or are not specifying) at this time what qualifies as “high.” Nor is the County suggesting how these levels will be monitored and reported. Finally, the fact that there “may not be” a resultant potential for ground water contamination” is not terribly reassuring.

As noted in this section of the document, more research is necessary. A well-designed, well regulated system for handling chemical-laced waste water, sediments and sludges, combined with frequent on-site monitoring, will also be necessary to ensure ground water and surface-water safety.

CONCLUSION:

Evidently, more research and regulatory development is required to handle the many questions raised throughout the County's recommendations, as well as some questions raised here. And clearly, both the recommended research and the various monitoring and regulatory standards suggested here will represent significant costs, both in terms of time and money.

In some cases those costs may be deemed prohibitive. I would suggest, though, that if mining can't be done profitably in this area while also safeguarding the health and welfare of this community *and* protecting the sustainable value of our unique landscape, ecosystems and local economies, then it should not be done at all.

Consider the perspective offered by Winona County high county highway engineer Dave Kramer. In response to one County commissioner's concerns that small operators would be unable to pay the fee, Mr. Kramer noted that the county isn't responsible for the industry's health, only the health of the county's roads.

"The approach that I've taken is not to try to set the fee at a level that guarantees a profit, but to set it at a level that covers our road costs," Kramer said. "Let the profitability shake out on its own."

I would like to see our County take a similar approach in assessing not just road costs, but all the costs, impacts, risks and other potential trade-offs associated with mining in our community. It should assess significantly higher fees where necessary to fund staff additions, and require mining interests to cover any and all costs associated with requirements for monitoring, reporting and damage mitigation.

By doing so, our County representatives will safeguard the health and welfare of the communities they represent, while also encouraging growth mechanisms for long-term economic prosperity that do not conflict with that essential goal.

Thank you for the opportunity to comment on this document, and again, much appreciation and deep respect for all those who contributed to its development.

Warm regards,

Pilar Gerasimo

Pilar Gerasimo grew up on a family farm near Menomonie, Wisconsin. A health journalist by trade, Pilar recently served two terms as Chairperson for the Town of Lucas in Dunn County, and has also served on Dunn County's Solid Waste and Recycling Board. She is the founding editor of Experience Life magazine, an award-winning healthy-living publication with a national reach of nearly 3 million people. Gerasimo also serves as Senior Vice President of Education for Life Time Fitness and is a member of the board of advisors for the University of Minnesota's Health Journalism program. A Fulbright scholar, she holds a BA in Comparative Literature from Mills College in Oakland, California. Pilar can be reached at her cell phone (612-817-8208) or at pilar@gerasimo.com.