Petition to the Minnesota Environmental Quality Board for a Generic Environmental Impact Statement on Industrial Silica Sand Mining

In accordance with Minnesota Rule 4410.3800, a generic environmental impact statement (GEIS) may be ordered by the Minnesota Environmental Quality Board (EQB) to study types of projects that are not adequately reviewed on a case-by-case basis. The rapid expansion of “frac” sand mining in Wisconsin has created significant controversy, documented nationwide. Impacts and concerns have been identified by affected Minnesota communities including: regulation, public health standards, natural resource protection, and the potential for cumulative effects on local economies and social ecologies – of large-scale industrial silica sand mining. The nature, scope, scale and timeline of market forces driving this rapid expansion is unique. This creates the potential for cumulative impacts far beyond the control of any local jurisdiction. And therefore requires a statewide approach.

Petitioners represent residents, retirees, business people, farmers, and local government officials from South East Minnesota and in other communities identified as potential silica sand resource target areas. As public controversy intensifies, it is important to remember the role of the public as a partner in MEQB's mission to protect the natural and social ecologies and economies of the state. And the fundamental responsibilities of government at all levels to guard the public health, safety and well-being of our communities.

The Minnesota Environmental Quality Board (EQB) was established by the Minnesota Legislature in 1973 to serve as an interdepartmental forum for addressing and resolving environmental problems and issues. Insofar as EQB has traditionally recognized public concern as an indicator in the need for environmental review, we request a GEIS on Industrial Silica Sand Mining, based upon the considerations and specifications below, addressing criteria in rule 4410.3800. Though Minnesota's Environmental Review Program does not recognize circumstances in which preparation of a GEIS is mandatory, factors outlined in the rule are considered by the EQB in determining the need for a GEIS. These factors are:

A. if review of this type of action would be better accomplished by a generic EIS than by project specific review;
B. if the possible effects on the human environment from a type of action are highly uncertain or involve unique or unknown risks;
C. if a generic EIS can be used for tiering in a subsequent project specific EIS.
D. the amount of basic research needed to understand the impacts of such projects;
E. the degree to which decision makers or the public have a need to be informed of the potential impacts of such projects;
F. the degree to which information to be presented in the generic EIS is needed for governmental or public planning;
G. the potential for significant environmental effects as a result of the cumulative impacts of such projects;
H. the regional and statewide significance of the impacts and the degree to which they can be addressed on a project-by-project basis;
I. the degree to which governmental policies affect the number or location of
such projects or the potential for significant environmental effects;
J. the degree to which the cost of basic information ought to be borne by the public rather than individual project proposers;
K. the need to explore issues raised by a type of project that go beyond the scope of review of individual projects; and
L. the need to understand the long-term past, present, and future effects of a type of action upon the economy, environment, and way of life of the residents of the state.

Considerations:
In considering the need for a GEIS for frac sand mining, we have to begin with a multi-layered description of the Minnesota landscapes being targeted for their rich, “pure” silica sand resources. These deposits are situated in our major river valleys and adjacent plains, lands whose resources are important to Minnesota's top two economic bases: agriculture and tourism. We must describe the history and ecology of these landscapes and their role in shaping Minnesota's history and identity. This is where we have to begin.

Then we have to closely examine the landscape ecology of these newly defined “silica sand resource” areas; the many “green infrastructure” functions the landscapes perform; and the multiple contributions they make to the quality of life and health of their watersheds and communities. The flows of surface and groundwaters in this karst-ridden geology are complex and vulnerable to contamination. Blufflands perform essential groundwater recharge functions; and are laced with a network of wetlands and trout streams. The landscape in which these ancient silica sand resources are embedded is part of a complex set of interdependent social and natural systems; an interlaced system of rock, aquifer, habitat and watersheds that flow towards the Mississippi River – the throbbing vein of American commerce, history and culture.

In order to consider the potential cumulative socio-economic impacts from industrial scale silica sand mining, to Minnesota lands and communities, we must also describe the cultural and historic values of our “prime frac sand resource areas”. We must understand how their economies depend upon the particular environmental features of these landscapes, the soils, the blufflands, the waterways, and a rich diversity of plant, wildlife and migratory populations – which are the basis of agricultural, tourist and recreational economies. (Goodhue County alone is sanctuary to over 40% of MN's rare and endangered species.) Rural character and farmlands are protected as prime values in dozens of SE Minnesota comprehensive plans. And our historic rural and river towns, annual festivals, bike trails, and storied landscapes are key features of Minnesota's identity and quality of life.

Minnesota's river valleys are celebrated for their scenic viewsheds, parks, recreational and tourist resources. The Great River Road runs border to border, from New Orleans through Duluth, and is one of the country's most beloved and traveled scenic byways. The Upper Mississippi River Valley features federally designated recreational and wildlife areas. The cultures, quality of life, and landscape ecologies of Minnesota's “Three Rivers” Valleys, the Mississippi, Minnesota and St. Croix Wild and Scenic Riverways – are critical state, regional and national assets. The beauty and integrity of these landscapes, their “green infrastructure” functions, and natural and historic communities are a statewide and regional concern.
A. Review of potential socio-economic and environmental impacts of Large-scale Industrial Silica Sand Mining would be better accomplished by a generic EIS than by project specific review; would inform state policy, local permitting and review.

Just across the river, Wisconsin's hills and dales are being strip-mined. Industrial Silica Sand Mine expansion is proceeding at a dizzying rate, driven by market demands of oil and gas shale deposit “fracking”. Millions of gallons of water are being pulled out of aquifers to get to sand deposits and many millions more are needed for processing and washing. “I've never seen anything like it” is a frequent refrain, from locals to national industry spokespersons.

Counties are pummeled with permits, sometimes 4 and 6 at a time. Communities are threatened; public hearings are packed. A few landowners have benefited from escalated land prices. Some have new jobs, or promises of jobs. A few communities are taking advantage of economic development opportunities of “frac” sand mining. But many more are in anguish over the rapid spread and intensification of operations, changing landscapes, regulatory gaps, a proliferation of environmental “incidents”, and fears of unknown exposures to silica sand dust.

Minnesota is perched precariously on the edge of this “frac sand rush”, protected only by a network of fragile time-bound county and township moratoriums, held together with baling wire, string and the activism of thousands of concerned citizens. Dozens of townships and cities on both sides of the river have enacted moratoriums. Mining study committees are proliferating. There is some information sharing but little coordination. Independent expertise is difficult to come by, and unevenly applied. Several counties have reluctantly extended their moratoriums for another year. This is due to the difficulty of writing comprehensive ordinances and adequately educating and preparing their local units for a rush of permits, land purchases and public outcry. Yet within a year, most of these extensions will also have expired, and cannot be renewed.

There are no model ordinances and regulatory gaps are only beginning to be identified and explored. There are many questions yet to be addressed, including public health exposures to silica sand dust and cumulative impacts to the quality of life and local economies. Habitat fragmentation and wildlife impacts are unexplored. Some water issues are “too complicated” for county governments to address because aquifers do not recognize government boundaries, and impacts to underground water resources are often multi-jurisdictional in reach. Yet within a year, most local moratoriums and extensions will have expired, falling far short of achieving environmental policy objectives long held by the State.

State law provides an agency framework for the protection and development of Minnesota's assets. The Minnesota Environmental Quality Board member agencies are the keepers of Minnesota's asset base. We look to MEQB and her sister agencies to ensure that the environmental and socio-economic values of the State of Minnesota and region are fully assessed and protected in accord with Minnesota environmental policy 116D.02. A generic environmental impact statement on industrial silica sand mining is needed to provide for efficient use of resources, and fair and effective enforcement of regulations and ordinances.
• Agency expertise and mandated responsibilities address different facets of Minnesota's social, economic and environmental assets.
• Evaluation of industry impacts must consider an interlacing set of inventories, planning activities, and long term investments that have evolved to protect and utilize these assets.
• New tools and understandings have evolved, including “green infrastructure”, “Landscape ecology”, expanding GIS capacities, public access to web resources and previously compartmentalized databases.
• Agency coordination is needed to assess the potential for collective/cumulative impacts, provide recommendations, guide policy development, and provide a consistent framework.
• State agencies have the maps and inventories we need to identify, evaluate and address potential impacts; these tools will allow for layering of these resource maps over each other – geological, the socio-economic, the cultural, historic, scenic, agricultural.
• These and other State-provided technical resources are needed so that proposers, state agencies and responsible local governments will have sufficient information and a common platform from which to conduct review and permitting.

State agency activities are required to be conducted in accordance with 116D.03 to:

“on a continuous basis, seek to strengthen relationships between state, regional, local and federal-state environmental planning, development and management programs”; to “utilize a systematic, interdisciplinary approach that will insure the integrated use of the natural and social sciences and the environmental arts in planning and in decision making which may have an impact on the environment”; to “identify and develop methods and procedures that will ensure that environmental amenities and values, whether quantified or not, will be given at least equal consideration in decision making along with economic and technical considerations”; to “study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources”; to “make available to the federal government, counties, municipalities, institutions and individuals, information useful in restoring, maintaining, and enhancing the quality of the environment, and in meeting the policies of the state...”; to “initiate the gathering and utilization of ecological information in the planning and development of resource oriented projects”; and to “undertake, contract for or fund such research as is needed in order to determine and clarify effects by known or suspected pollutants which may be detrimental to human health or to the environment, as well as to evaluate the feasibility, safety and environmental effects of various methods of dealing with pollutants”.

B. Possible effects, and cumulative effects, on human and natural environments from large-scale industrial silica sand mining are uncertain or involve unique or unknown risks.

There are concerns associated with intensive large-scale industrial silica sand mining in Minnesota that involve uncertain or unknown risks to human health; the future sustainability and quality of our water resources; and the health and well being of social and natural systems – the flora and fauna of the State. These include, but are not limited to:
Releases of respirable silica dust to ambient air from silica sand mining, processing and transportation/storage activities. The dangers of “silicosis, resulting from silica dust exposures, are well known. With the national expansion of fracking and “frac sand mining”, these concerns are increasing. To date, however, monitoring of silica dust exposure is conducted only in closed industrial settings. And there is no practical method of measuring exposures in ambient air conditions to particle sizes specific to silica sand mining. Concerns from Winona to St. Anthony have put this issue in the forefront. The US Occupational Safety and Health Administration (OSHA) has recently issued an Urgent Hazard Alert warning that dangerous exposure levels of respirable silica dust were occurring during transportation and handling of materials at FRAC drilling sites in the US. With intensification of the development of mining, processing and transportation sites, fugitive silica dust could become a public health issue. Yet the parameters of this threat are currently unknown. Development of ambient air monitoring techniques, data analysis and control of fugitive silica dust, coordinated at the state level, is a high priority.

Depletion and contamination of ground water from silica sand mining operations.
- Washing and (market) grading of raw silica sand, requires that millions of gallons of water be extracted by wells. Chemicals are added to the water to aid the washing process. This water must be held in storage ponds after use to allow the sediment to precipitate.
- Additional “clean water” holdings from “dewatering” of aquifers also need to be accommodated on site. Changes in land use, and the requirements of mining operations will affect existing “green infrastructure” services in unknown ways.
- What impacts to groundwater supply and safety, as well as ground and surface water dynamics should be considered?
- How will increased filtration, with the removal of overburden and protective layers increase the potential for groundwater and aquifer contamination?
- How will on site operational demands impact volume, aquifer sequestration, wells, agriculture and other appropriations in the vicinity?
- How could this new, large-scale industrial demand affect adaptability and sustainability of water supply and quality in increasingly unpredictable patterns of drought and dramatic storms?

While mining in aquifers is not an entirely new practice, the potential for more extensive and intensive demand needs to be evaluated, along with analysis of the potential for new “point source” pollution, particularly in karst geology. Consistent, proactive and enforceable practices for analysis, monitoring, inspection, and accountability need to be developed.

Effects of runoff and contamination of surface water by silica sand mining operations. Because of the rich deposits of “pure” silica sands in the riverbeds, these operations are often adjacent to waterways that are of local, state and national importance. Some of these waterways have existing issues, including sedimentation. Lake Pepin is a prime example. The proximity of mining operations to these waterways creates the potential for cumulative and interacting impacts, including run-off from stock piled over burden, impervious surface additions from mining operations in sensitive areas, and altered drainage pathways.
Holding (settling) ponds can contain millions of gallons of sedimented water. The recent event at a Wisconsin mine adjacent to the St. Croix River, resulted in the release of sediment-contaminated water through wetlands and into a protected portion of the River. The sediment release was not detected by company personnel, or by the Wisconsin DNR. It was reported by a citizen. There is not a specific best practices or standard for holding ponds and surface water management. The development of practices and standards for run off and holding pond management, including monitoring, inspection, response, and accountability is required.

C. A generic EIS can be used for tiering in a subsequent project specific EIS.

There is a clear and present danger in our ability to characterize and map the locations, depths, and extent of silica sand deposits, statewide – as is being done both by industry and government. That is, the assumption that if the resource exists, it should be mined. Economic feasibility and profitability (or “purity” of the resource) is the first cut, and the basis of industry proposals. A second criterion, from the proposer's perspective is proximity to transportation and/or processing facilities, or sufficient space on site for one or both. It is an easy thing for local units of government to allow this economic rationale to prevail and a difficult thing to analyze or counter fiscal arguments or offers of local benefits. Unless there is uncommonly effective environmental review, the environment is left out of the equation, despite the policy imperative that “economics alone shall not justify” compromise of Minnesota's environment (Minn. Stat. § 116D.04, subd. 6).

One potentially valuable application of the use of tiering in an Industrial Silica Sand Mining GEIS might be in applying environmental policy to what is now a well-mapped resource, statewide. A GEIS can ask: what are the issues; what are the impacts?”; “what are the alternatives”; “what criteria should be used to judge where large scale industrial silica sand mining is NOT an appropriate land use, from an environmental perspective?; “with what existing economies and uses (e.g. roadways, bluff and agricultural lands, wildlife habitat, local aggregate mines) might industrial frac sand mining compete?”; “how should cumulative impacts to resources, socio-economic and quality of life factors be considered?” etc.

A GEIS can develop criteria, make recommendations and provide policy direction that can be used in project specific environmental review. This would give environmental concerns standing, whether or not they can be specifically quantified. And enable local government, and proposers to factor them into siting, analysis and review. A state level GEIS can also more effectively communicate expectations, and develop requirements to ensure that proposer's are consistently forthright, transparent, and accurate in their dealings with landowners, communities, and local governments. And visa versa.

D. Basic research and interagency collaboration is needed to understand the potential impacts, and cumulative impacts of large-scale Industrial Silica Sand Mining.
Mining advocates claim that Industrial Silica Sand Mining is “just like traditional limestone aggregate mining for road and agricultural purposes”. This is clearly a misrepresentation. Silica sand mine operations in adjacent areas of Wisconsin are much larger in scale. They dramatically alter the landscape, ground cover, and impact watershed, surface and ground water cycles in yet to be understood ways.

Existing (Maiden Rock) and proposed new mines (Diamond Bluff) are underground operations with tens of miles of tunnels that may alter and disrupt ground water in the karst geology present throughout this “driftless” area. Open pit and tunnel mining operations present different practices, issues and concerns. Most mines will occupy land in the midst of active croplands and animal farms. They will use the same roadways and routes. They may disrupt or displace agricultural activities and the delicate balance of tourism and recreational economies.

All silica sand must be washed and graded at some point in the production process. Large industrial plants must be created to perform these operations - usually adjacent to or in near proximity to rail or barge loading facilities. Most of these facilities will be built in or near small cities and rural villages. Transportation of millions of tons of silica sand from the mine site to a processing or loading facility will require tens of thousands of semi-truck loads, traveling long hours daily and year round. These operations, road usage and deterioration plus sand spillage and silica dust can cause safety problems, as well as disrupt local economies and quality of life. Exposures and effects to ambient air quality have yet to be quantified, monitored or analyzed. What measures will need to be taken to protect public health?

Qualified and experienced professionals, without demonstrated bias, are required to study and evaluate all facets of proposed mining operations to establish best practices and operational guidelines and to develop draft regulations and requirements for silica sand mining. In addition, a coordinated database of ordinances adopted by local units of all sizes is needed to assure State environmental policy objectives are met.

**Issues of particular concern are:** fugitive respirable silica dust, ground water depletion and contamination, environmental degradation, destruction of flora/fauna habitat and species, transportation congestion, government infrastructure burden, loss of community character and public scenic values, impacts to local economies, personal real estate value, quality of life and community mental health.

This work should include but not be limited to the following subjects and disciplines:

- Mining operations and practices
  - Mining and civil engineering public health
  - geological engineering
  - hydrology
  - safety engineering
  - landscape architecture
  - industrial hygiene
physiologists

• Processing plant operations and practices
  ◦ mechanical engineering
  ◦ safety engineering
  ◦ industrial hygiene
  ◦ physiology

• Transportation
  ◦ transportation engineering
  ◦ transportation safety
  ◦ local and State highway and law enforcement and officials.

• Impacted City /Rural Communities
  ◦ community well being and relationships
  ◦ public health
  ◦ Local and resource-dependent economies
  ◦ public safety
  ◦ community infrastructure

E. the degree to which decision makers or the public have a need to be informed of the potential impacts of such projects.

A great deal of time has been spent in silica sand mining study committees debating fundamentals that could be clarified in a GEIS. This has been an unfortunate diversion of time and resources. Examples include representations that, for instance, “sand is sand” and there is “no difference” between silica sand and construction sand or aggregate. This then leads to debate over whether or not silica dust exposures are any more hazardous than beach sand etc. The facts are well established in industry and federal regulatory materials that crystalline silica is a hazardous substance which requires strict protections. It was a relief to have the Department of Health confirm this fact at a public meeting in Winona on June 20th, 2012. It is important for decision makers and the public to be accurately informed, for them to spend their time and resources well. The state is the best source of this kind of information.

F. the degree to which information to be presented in the generic EIS is needed for governmental or public planning.

Because of the regional nature of industry expansion plans, it is difficult for local units of government to plan for or assess the potential impacts of a rapidly expanding industry with strategic goals, contracts, and funders that are not available or transparent to local permitting authorities. Mapping of silica sand resources makes it possible for industrial scale silica sand companies to target specific areas for development, and buy up existing construction sand and aggregate mining operations for repurposing (to silica sand) and expansion.

With increasing pressures, this drive for industrial mining expansion, as is happening in
Wisconsin, tends to overwhelm existing comprehensive planning priorities and community values. These values often include rural character and quality of life, sustainability, and agricultural and natural resource protections. All of which are challenged by the introduction of large-scale industrial silica sand mining into rural areas. A wider view of planning and resource protection is needed to inform governmental planning and to ensure that state and local environmental policy and protections can be maintained.

The scope of the GEIS should meaningfully engage economic and resource analyses of current and future market factors for the “frac sand” mining industry, including boom and bust cycles, and alternative propellant products or sand supplies. What are drivers that will significantly affect potential impacts? What are the trends? How much sand are we talking about? For how long will mines be operating, and what are the estimated total tons mined, average profits anticipated? Are there recommended terms for legal and financial assurance of reclamation? These factors can impact a whole region.

This is not information that is available to isolated local units facing multiple permit processing pressures. GEIS scope should include demands the industry places on infrastructure, or infrastructure development, and analysis (utilizing state level data, e.g. tourism and recreation) that would allow local units to evaluate potential displacement or disruption of local economies and ecologies – of both natural and social environments.

G. the potential for significant environmental effects as a result of the cumulative impacts of such projects.

Large-scale Industrial Silica Sand Mining will redefine our landscapes, and will alter the economies and ecologies of fragile social and natural systems and communities. As we know from the Wisconsin experience, the “frac sand rush” introduces a set of economic drivers that demands expanding access to these assets. We know from citizen and local government mining study committee discussions in Minnesota that concerns around cumulative impacts range widely, and include:

- water appropriation (and statutory priorities);
- cumulative impacts to aquifer geology, water quality and recharge system sustainability;
- added sedimentation burdens, from holding ponds near wetlands and waterways;
- removal of irreplaceable top soils, and displacement of productive agricultural lands;
- increasing landscape ecology stressors that could cumulatively undermine system sustainability and affect system capacity for adaptation to climate change -- particularly in times of increasing unpredictability of weather and precipitation patterns;
- cumulative local and regional impacts to existing socio-economic systems, including (but not limited to) tourist and recreational resources;
- displacement and/or removal of overburden and future availability of resources for local markets and needs; removal of protective aquitard in one area, can affect aquifer transport in broader area;
- potential for cumulative impacts from new point-source pollution;
• disproportionate administrative burdens to local governments;
• cumulative impacts of density and intensity of mining activities, including mining, processing and transportation – on public health and safety; and particularly silica sand dust exposures, between and beyond operational borders;
• impacts of exponential increases in truck traffic, on public health, safety, local and regional plans for multi-modal access, trail development and tourism and recreational uses of the roadways;
• cumulative impacts of large scale, expanding scale silica sand mining industry to community character, quality of life, peace of mind and general well-being;
• disruption or displacement of local, regional, state and federal plans involving long term investments in environmental restoration, and resource protection (e.g. Trout Unlimited, Goat Prairie protection etc.

Assessment and mitigation of potential cumulative impacts requires the utilization of interdisciplinary fields such as Landscape Ecology that addresses questions of: “how to manage populations of native plants and animals over large areas as land use or climate changes, how to mediate the effects of habitat fragmentation or loss, how to plan for human settlement in areas that experience a particular natural disturbance regime, and how to reduce the deleterious effects of nonpoint source pollution in aquatic ecosystems, all demand basic understanding and management solutions at landscape scales” (Wiki).

Most importantly, a GEIS must closely and critically examine promises of 'reclamation' and 'restoration'. Can these multiple, large-scale changes to the landscape really be “mitigated” or “restored”? Can displaced resources such as topsoils, confining clay layers, rare and endangered natural communities, fragmented habitat and corridors, really be “reclaimed”? Can disrupted or displaced local economies based upon these resources, really be “restored”? Landscape ecology has been competently introduced into the Goodhue County study, but is being developed as evidence that mitigation and reclamation can be applied to any landscape that may be desirable for mining.

Under what circumstances and at what thresholds do we consider a priority to protect the integrity of local social and natural ecological systems that provide low cost, multiple “green infrastructure” and social support functions? What are the cumulative impacts we wish to avoid? And how can state level priorities, policies, asset inventories, existing tools and resources of EQB’s sister agencies be coordinated and applied to these questions and concerns.

These are factors that local government can consider. But without the proactive support and application of state agency expertise, it is difficult to interpose and justify this kind of planning layer into the rigors of ordinance creation, permitting, and enforcement at the local level. The widely discussed withdrawal of DNR support and enforcement in Wisconsin has created a very difficult vacuum for citizens and local units to fill, and is a path that we trust Minnesota will not follow.

H. Potential and cumulative impacts of the demand for large scale industrial silica sand
mining operations in our state and region are significant, and cannot be sufficiently addressed on a project-by-project basis;

Even while extraction demand is growing exponentially in Wisconsin, industry estimates for how much sand is needed and over what kind of timeline vary widely. Recent rail contracts in Wisconsin, and infrastructure demand response in Minnesota, indicate that the industry is preparing for long-term expansion. Demand is linked not only to fracking operations, but to the development of a national commodity market for “pure” Minnesota frac sands.

Local studies are using various assumptions about timelines from an intensive 10-year period to 30-50 years of operations. Without this essential information, it is impossible to project cumulative impacts or incorporate industrial sand mining into local planning exercises in a way that is protective of public interests, natural, economic and social systems.

Cost benefit analyses that compare potential for mining company profits with offsetting costs to the environment are not currently being performed by local governments. Without a State GEIS, the potential is nearly certain that in sand resource target areas short-term profits from mining will be advertently or inadvertently subsidized with permanent loss of environmental resources that no amount of mitigation can ever restore. There is evidence that some early projects in the “sand rush” were evaluated using profit forecasts that did not include the loss side of the ledger. For those projects the local review standard failed and there is little evidence that these operations will actually benefit the local community or be sustainable in either the short-term or long-term.

Financial analysis of short and long-term costs and benefits is typically missing from current hit-and-miss standards of local review and permitting. There are reasons. Local governments typically do not have staff or financial resources to conduct a sophisticated financial analysis, and as a result this may represent the very core of the problem. Local government decisions are limited to jurisdictional boundaries, and if comprehensive financial analyses are not currently being performed within a community, it goes without saying that costs or benefits to adjacent communities or to the State are not considered.

State environmental and economic policy objectives will often not be met in this scenario. In a rush to mine targeted sources of frac sand, no one can doubt the potential for economic gain by a mining company, and even a few individual landowners will profit immensely. But the current system of accountability does not necessarily recognize potential costs to adjacent landowners, often pitting neighbor against neighbor, does not quantify loss of public natural, scenic and other resource values, and does not evaluate other segments of local, regional and state economies that are dependent on an intact natural environment.

This is a new large-scale mining industry that has elements of mining, washing, drying, transportation (truck, rail, barge), and stockpiling. Even while industry is mapping their plans, local units do not have a clear understanding of how these operational elements are to be coordinated. As they evolve, mining operation and infrastructure permit requests are creating multiple layers of controversy. Until the industry can layout a plan for how this can be
managed in a fashion to minimize the adverse effects on the environment, communities, and local and state economies, it should not be allowed to proceed unchecked on the current project-by-project basis.

**Natural Community impacts:** Help is particularly needed to assess long-term impacts to disturbances of terrestrial habitat. Surface sand is well drained and has representations of diverse plant communities some of which are rare and endangered, such as goat prairie – which is an indicator of silica sand resources. These sites are easy to mine and, therefore, sought by industry. We need help describing and protecting plant and wildlife communities threatened by proposed mining, including the following concerns: further fragmentation of plant communities and wildlife corridors; road traffic; movement of construction materials which increases spread and invasion of exotic plant species; some sites will be particularly vulnerable to non-native species invasion. Habitat removal and squished herpetofauna is another concern. Like the human communities, these natural communities will be impacted by large-scale industrial disturbances involving more intensive use of roads, truck traffic, dust and lights. How might migratory species be affected by rapid and expanding alteration of ancient flyways?

**Socio-Economic Impacts:** It is particularly difficult for local permitting processes to evaluate and incorporate socio-economic and quality of life concerns, which are primary to their residents. Professional evaluation of these cost and benefit factors has so far been limited and skewed towards the promise of jobs, and opportunities for landowners and industry.

The driving needs and disproportionate profitability of the industry, displaces local concerns and encourages disingenuous strategies to obtain permits. This complicates the challenge for local governments. A recent proposal for 'the largest transportation site in Western Wisconsin', – on an historic site and within the scenic byway buffer – at Stockholm, Wisconsin, is a prime example. The same company is reported to have purchased rights to a small family marina directly across the river in historic Frontenac. And Red Wing is fighting a bargeing facility expansion for use for frac sand at the NSP plant, just below Barn's Bluff. Expanding infrastructure demands at St. Charles, below Winona, are also embroiled in controversy.

In many instances companies are buying up parcels that do not meet state thresholds for environmental review, some intentionally just a few acres short. Currently no effective formal environmental review process exists to provide analysis of the collective impacts or address questions such as the following:

- What are the best ways to measure impacts on culture, historic landscapes, recreational and tourist economies, community values, psychological and social well-being?
- Can conflicts of scale be managed? How will perceptions of our communities change with the introduction and expansion of large-scale industrial sand mining operations?
- How will increased truck traffic affect regional trails and bikeways?
- Is it possible to measure and document incidental increases to silica sand dust exposures, when the symptoms of silicosis are so variable, and can cause disability and fatalities many years from the time of exposure?
- What constitutes “prudence” for a health threat that is “irreversible, but preventable”? 
I. There is insufficient information to determine the degree to which governmental policies can or should affect the number or location of such projects and the potential for significant environmental effects.

This large new industry is affected by numerous governmental (many levels) policies and the rules and regulations that are in place to execute these policies. But because of the current lack of coordinated effort and lack of regional planning, there has been little or no affect on the siting or number of projects.

- The current integrated Frac Sand Mining & Processing Task Force lists 32 contact persons representing eight state agencies.

- Counties in Southeastern Minnesota currently have moratoriums, during which they are attempting to learn about this new industry and to revise their respective ordinances.

- Some municipalities have zoning in place that cover some of the activities associated with this industry. A few townships have zoning and others have discussed implementing zoning as a means to manage this new industry within their jurisdictions.

- The U.S. Army Corps of Engineers, Coast Guard and the railroads have a large role. We hear that some portion of the sand dredged from the Mississippi River may be suitable for hydraulic fracking.

There has been little discussion and information shared amongst these governmental units, and that which has occurred, has been by ad-hoc request and requirements of affected communities facing onerous responsibilities to attempt to assess proposals. Local units are devoting a disproportionate amount of time and resources to the effort. Public meetings are drawing hundreds of concerned citizens who are devoting thousands of dollars and hours to becoming informed and respond to what they see as a threat, not only to their communities but to the natural resources of the state (e.g. A public meeting in Winona, attended by the IISM&P Task Force, presented to and discussed questions with an audience of 250).

J. The degree to which the cost of basic information should be borne by the public rather than individual project proposers, and its relationship to economic industry drivers.

The State has an obligation and responsibility to gather sufficient information about the nature, scale and duration of the coming industrial mining of silica sand in Minnesota in order to be able to protect and assure the health, safety and long-term well-being of its people and the environment. The ability to realistically assess environmental costs and benefits is essential at all levels of government. Socio-economic impacts to small river communities can have state and even regional economic effects. Impacts to wildlife corridors and landscape ecologies have economic as well as environmental implications.
The special resource areas targeted for sand mining operations have historically drawn large public, non-profit and private sector investments in planning, regulation and development, including federal plans for Mississippi River refuge and recreational areas, The Great River Road, Trout Unlimited, Mississippi Valley Partners, and many others. Compromise of these resources will have impacts to all of these investments, and to potential future investments.

Meanwhile the industry is continuing to invest heavily in researching, strategic networking, and planning for exploitation of sand resources in the upper mid-west region. Much of this effort in Minnesota has been conducted out of public view. However these plans are becoming more visible, as a number of international conferences held throughout the country this summer, are addressing issues of identification and acquisition of mining land and processing sites, sourcing of trained labor, transportation and logistics constraints and project financing.

International oil and gas corporations and their investors are arguably the wealthiest entities and individuals in the world. These companies will reap huge profits resulting from the mining of silica sand found in the unique geology and geography of southern Minnesota, and enabling them to continue and expand the hydro-fracking drilling method of extracting oil and natural gas from shale formations in the United States and other nations. Local government regulation and action alone cannot protect Minnesota's assets from this kind of exploitation. This is an international market driver.

Recent study of the economic development potential of industrial silica mining operations in Wisconsin, demonstrates that that we will gain little and may stand to lose a great share of our future health, welfare and economic and environmental values. The mining, processing and transportation of silica sand will likely have minimal direct benefit to the people and government of Minnesota. The major portion of the gain from the exploitation of silica sand proppants will accrue to a few land owners, out of state investors and the senior management of mining companies, plus multinational oil / gas and related corporations located outside of Minnesota. A high-level policy assessment of the impacts of the driving dynamics of the industry oil and gas corporations is needed.

Minnesota MUST conduct research and create, monitor and enforce STRONG regulations to assure the health, safety and well being of its citizens and to insure the viability and economies of its cities, villages and farms and to protect our native plants and animals from loss of habitat and species.

Minnesota’s effort to research, monitor and enforce mining regulation should not be an added burden on individual taxpayers and other business interests should not be required to subsidize, directly or indirectly, the mining industry. In providing for funding for a GEIS, the legislature should consider that a tax similar to that levied on the iron mining industry be imposed to hold the silica sand mining industry directly accountable to the State and local governments and public welfare.
K & L. The pending development of expanded, large scale industrial silica sand mining in Minnesota raises issues that go beyond the scope of review of individual projects; and creates an imperative to understand and consider the long-term past, present, and future effects of a type of action upon the economy, environment, and way of life of the residents of this state. [The following summary of GEIS characteristics is adapted from Jaakko Pöyry Consulting, Inc., Minnesota GEIS for Forestry]

A GEIS differs from project-specific environmental impact statements (EIS) in the following four major ways:

1. **Cumulative Impacts Focus.** While a project-specific EIS typically examines environmental impacts within a limited geographic area, a GEIS analyzes the cumulative impacts associated with a number of separate, yet related activities. In the case of a GEIS on industrial silica sand mining, cumulative impacts are those resulting from the intensification of development of these resources; their location in sensitive resource areas of the state; and their collective impact upon and competition with existing native natural communities and local economies, which are largely dependent upon the affected resource base, including agricultural, tourist and recreational economies. The proximity and intensity of this development to residents, towns and cities will also have (as yet undetermined) implications for public health. It is critical to examine potential collective impacts of multiple operations on the state's overall economy, resources and communities – before the “frac sand rush” is upon us.

2. **Discretionary Nature.** The administrative rules governing the state's Environmental Review Program establish general criteria for determining when it would be in the state's best interest to prepare a GEIS. The decision by the EQB to prepare a GEIS is voluntary. Because a GEIS is considered an alternative form of environmental review, projects under consideration by a GEIS are still subject to normal environmental review procedures and requirements, as well as environmental permit procurement procedures. A GEIS is considered a long-range planning document that can provide useful information regarding geographically broad and long-term consequences that are unlikely to be identified in project-specific environmental review processes. Therefore, a GEIS provides the context within which future project-specific EISs can be assessed.

**Efficient use of resources:** Additionally, preparation of a GEIS provides an opportunity to apply existing reports, plans and tools; and to integrate new tools, into interagency collaboration on issues of critical importance to Minnesota's environmental and economic resources base.

3. **Recommendation Development.** A third distinction between project specific EISs and GEISs is the focus of the GEIS on developing recommendations. Traditional environmental review documents assess the likely consequences of feasible and prudent alternatives to a proposed action (e.g., changes in process technology, proposal size or site location), but do not state which of the analyzed alternatives is preferred. These decisions are left to the government agencies responsible for issuing the necessary
development and/or environmental permits. A GEIS is not limited to strictly the analysis of impacts, but can advocate strategic policy and program direction through the development of recommendations to address the identified impacts.

4. **Funding Mechanism.** Unlike project-specific development proposals where the costs associated with preparing environmental review documents are borne by the project proposer, no mechanism exists for assessing the costs of preparing a GEIS. Funding for a GEIS is typically via special legislative appropriations, contributions of EQB member agencies, or outside funding sources. The EQB does not have the authority to establish rules relating to assessing the costs of preparing a GEIS.

**Conclusion**

Industrial “frac” sand mining is a new large-scale industry for southern, south eastern and east central Minnesota and extends into Wisconsin. The Minnesota, Mississippi and St. Croix National Scenic Riverways and their adjacent communities are within the principal targeted areas for silica sand mine development in Minnesota. The extent and duration of the demand for this mining activity cannot be described until the industry provides publicly available estimates of sand required per year, and for how many years. Alternative manufactured proppelants to “frac sand” exist, and are said to be 30% more effective, but the economics of using these alternatives is not informed by calculations of social, economic and environmental costs to Minnesota’s asset base and public health. Potential to avoid harm to Minnesota’s environmental resources by use of commercially available alternatives to Minnesota’s “pure” silica sand has not been assessed by any local government and not by the State. It is possible that all or most projected environmental harm to some targeted areas within Minnesota, especially in areas that have already been identified for protection, is completely avoidable.

These are calculations that need to be made and questions answered before this new industry should be allowed to move forward. Premiere amongst these are:

1. What is the relationship between mining increased levels of silica and respiratory disease?

2. What is the industry system for extracting sand, processing and transporting it to truck, rail and barge? Is it an integrated system developed beforehand, or is it to be a distributed system that evolves.

3. What will be the means for establishing fees assigned to industry to ensure that damage e.g. wetland reduction, road deterioration, well contamination, property value, health care paid for or compensated?

4. How will the industry develop when it is required that they work through the regulatory framework of several state agencies, local units of government and some Federal jurisdictions?
5. Is some portion of sand dredged from the Mississippi River suitable for hydraulic fracking? If yes, then how much of the industry need does it satisfy?

6. In addition to 5, are there alternatives to sand, e.g. ceramic proppants that have less of an environmental, social and economic burden?

We believe that in order to answer these questions and to provide an articulated roadmap on how to proceed requires a time-out during which a **Generic Environmental Impact Statement** undergoes a robust scoping process and is completed. We request that you, Governor Dayton's cabinet, recommend to him a statewide moratorium. Ideally, the timeline would allow agencies time to assess; and local governments and citizens to access and utilize GEIS research and recommendations in planning, permitting and ordinancing. The sand has been here for 500 million years.

Respectfully submitted to Commissioner David Frederickson, Chair for review at the August 15th, 2102 meeting of the Minnesota Environmental Quality Board.

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Selection of resources referenced:
1. Recent UW study on economic benefits and costs of silica sand mining attached.
2. Dr. Crispin Pierce, UW-EC researcher on health effects of silica sand: http://www.uwec.edu/CONHS/programs/enph/silica/silicaresearch1.htm
3. Expansion of WI “frac” sand mining: http://ecowatch.org/2012/frac-sand-mining/
4. Tittle aerial photos of WI mines, in national article: http://ecowatch.org/2012/mining-companies-invade-wisconsin-for-frac-sand/