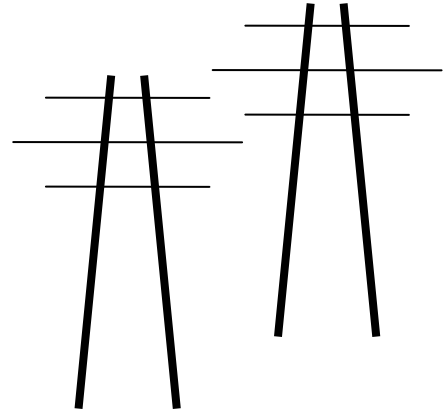


Legalelectric, Inc.

Carol Overland Attorney at Law, MN #254617
Energy Consultant—Transmission, Power Plants, Nuclear Waste
overland@legalelectric.org

1110 West Avenue
Red Wing, Minnesota 55066
612.227.8638

P.O. Box 69
Port Penn, Delaware 19731
302.834.3466



August 2, 2013

HAND DELIVERED

Jeff Smyser
Bob Patton
Kate Frantz
EQB Staff/MPCA

Dave Frederickson, Chair
Environmental Quality Board

John Linc Stine
MPCA Commissioner

Tom Landwehr
DNR Commissioner

Jim Kelly
MDH Environmental Health Manager

Charles Zelle
MnDOT Commissioner

RE: EQB Standards and Criteria, Minn. Stat. §116C.99; Minn. Stat. §116C.991.
MPCA Silica Sand Rulemaking, Minn. R. Ch. 7001, 7007, 7009, 7011, 7050
DNR Rulemaking, reclamation and other issues; Revisor's ID R-04198
EQB Silica Sand Rulemaking, Ch. 4410; Revisor's ID R-04196
EQB Mandatory Categories Rulemaking, Ch. 4410, Revisor's ID R-04157

Dear Mr. Smyser, Mr. Patton, and Ms. Frantz, Commissioner Stine, Commissioner Landwehr, Commissioner Zelle and Manager Kelly:

Attached please find a spreadsheet with suggested language for EQB Standards and Criteria for consideration by the Environmental Quality Board as a starting point for discussion. To be clear, these suggestions are not all inclusive, nor do they signal acquiescence to permitting silica sand mining in Minnesota. Our position is that the state should enact a ban on silica sand mining immediately.

I am filing this Comment on behalf of Winona County Citizens Concerned About Silica Mining (CASM). We ask to be added to the email list of notifications for all future meetings, notifications, drafts of Standards and Criteria and rulemaking, and other communications regarding these matters. We also ask to be included at the table at all future meetings regarding the Standards and Criteria and in the rulemaking proceedings.

At this time, we request that a Rulemaking Advisory Committee be appointed for all of the rulemakings, after open, public, and noticed solicitation for Advisory Committee members, specifically that Rulemaking Advisory Committees be established for the MPCA Silica Sand Rulemaking, the DNR Rulemaking, and the EQB Silica Sand and Mandatory Categories Rulemakings.

The notice for the EQB “Silica Sand Rulemaking” and Minn. Stat. §116C.99 asks for consideration of “whether the requirements of Minnesota Statutes, section 116C.991, should remain part of the environmental review requirements for silica sand.” Minn. Stat. 116C.991 is as follows:

[116C.991] ENVIRONMENTAL REVIEW; SILICA SAND PROJECTS.

(a) Until two years after the effective date of this section, an environmental assessment worksheet must be prepared for any silica sand project that meets or exceeds the following thresholds, unless the project meets or exceeds the thresholds for an environmental impact statement under rules of the Environmental Quality Board and an environmental impact statement must be prepared:

(1) excavates 20 or more acres of land to a mean depth of ten feet or more during its existence. The local government is the responsible governmental unit; or

(2) is designed to store or is capable of storing more than 7,500 tons of silica sand or has an annual throughput of more than 200,000 tons of silica sand and is not required to receive a permit from the Pollution Control Agency. The Pollution Control Agency is the responsible governmental unit.

(b) In addition to the contents required under statute and rule, an environmental assessment worksheet completed according to this section must include:

(1) a hydrogeologic investigation assessing potential groundwater and surface water effects and geologic conditions that could create an increased risk of potentially significant effects on groundwater and surface water;

(2) for a project with the potential to require a groundwater appropriation permit from the commissioner of natural resources, an assessment of the water resources available for appropriation;

(3) an air quality impact assessment that includes an assessment of the potential effects from airborne particulates and dust;

(4) a traffic impact analysis, including documentation of existing transportation systems, analysis of the potential effects of the project on transportation, and mitigation measures to eliminate or minimize adverse impacts;

(5) an assessment of compatibility of the project with other existing uses; and

(6) mitigation measures that could eliminate or minimize any adverse environmental effects for the project.

Minn. Stat. §116C.991 establishes the lower bound of environmental review for two years, perhaps intended to be in place during rulemaking. However, the requirements of Minn. Stat. §116C.991 must extend beyond two years through incorporation into the EQB Standards and Criteria, the EQB, DNR and MPCA rules, and the MDH value. No silica sand permitting should go forward until these rulemakings are completed and environmental review requirements and standards and criteria are established.

The notice for the EQB “Silica Sand Rulemaking” and Minn. Stat. §116C.99 asks for consideration of “whether the requirements should be different for different geographic areas of the state.” We note that the requirements are based on potential impacts, and on characterization of physical, geological and hydrological properties, and not geographic location. The standards and criteria should be based on these characteristics, applicable where those features are present, without regard to geography.

If you have any questions or require anything further, please let me know.

Very truly yours,



Carol A. Overland
Attorney at Law

cc: Winona County Citizens Concerned About Silica Mining (CASM).

Minn. Stat. 116C.99

Standards & Criteria (from statute)	Proposed language	Support for language
(1) Setbacks or buffers		
(i) Residence or residential zoning district boundary	1/2 mile from residence, use of berms/swales to divert flooding.	Public comments; see e.g., Goodhue Wind Ordinance; see also citations below in Groundwater and Air Emissions and Noise sections.
(ii) Property line or right-of-way line of any existing or proposed street or highway	1,000 foot setback from property line or right-of-way line, in addition to 1/2 mile from residence.	See citations below in Groundwater and Air Emissions and Noise sections.
(iii) Ordinary high water levels of public waters	1 mile from high water levels and containment pond and berm sufficient to prevent spill in normal operating conditions, high water, and heavy rain.	See citations below in Groundwater section.
(iv) Bluffs	1 mile from top of bluff (see karst section below).	See bluff protection ordinances (visual, land-use and geological protections).
(v) Designated trout streams, Class 2A water, flowing tributary of either	1 mile from designated trout streams, Class 2A water, flowing tributary of either, with berm/swale sufficient to prevent spill in normal operating conditions, high water, and heavy rain.	Minn. Stat. 103G.217; see also citations below in Groundwater section.
(vi) Calcareous fens	1 mile from calcareous fens and berm/swale sufficient to prevent spill in normal operating conditions, high water, and heavy rain. Some calcareous fens in SNA areas, which are already avoidance criteria.	Minn. Stat. 103G.223; DNR Calcareous fen list: http://files.dnr.state.mn.us/publications/waters/calcareous_fen_list_nov_2009.pdf
(vii) Wellhead protection areas defined 1031.005	1 mile from MGS karst sinkhole and one mile from bedrock joints; diversion with berms and swales; monitoring of wells during term of mining activity and 20 years after cessation of mining. State must develop standard regarding karst due to prevalence of Karst in Minnesota and relation of Karst to location of silica sand and aquifer recharge areas.	Minn. Stat. 103G.217, Letter 2/6/2013, Ehlinger MDH to Winona County; Hydrological Processes in Karst Terranes (https://itia.ntua.gr/hsj/redbooks/207/hysj_207_01_00_00.pdf#page=15)
	Develop sinkhole sealing plan.	
	Karst protocol, i.e., stop excavation where sinkhole develops; notify permitting authority of location; divert water/runoff from sinkhole with berms/swales, employ sinkhole sealing plan.	
(viii) Critical natural habitat acquired by DNR 84.944	1 mile from critical natural habitat.	DNR Rulemaking regarding silica sand mining
(ix) Natural resource easement paid wholly or in part by public funds	2 miles from natural resource easements (natural resource easements are established to protect resource)	DNR Rulemaking regarding silica sand mining
(2) Standards for hours of operation		
(county 6a - 10p 6 days a week)	Mining - 8 a.m. to 5 p.m. weekdays	
	Blasting - (narrower)(impulsive dBA over ___ not more than ___ per hour/day ???), vibration limit of _____.	
	Processing - 8 a.m. to 5 p.m. week days	
	Transportation - limited times, number of daily trips and haul routes	MnDOT Design Capacity, Road Agreements,

Minn. Stat. 116C.99

(3) Groundwater and surface water quality and quantity monitoring and mitigation plan requirements	(language of Standard and Criteria must include "protection" of groundwater and surface water quality)	
	Baseline testing on site for ph, nitrate and bacteria, Diesel Range and Gasoline Range Organics (aqueous and non-aqueous phase liquid) and identified and other potential contaminants; baseline and monitoring of ph, nitrate and bacteria, DRO and GRO, and identified and other contaminants in private wells within 1 mile. Identify on map and protect all recharge areas associated with mine production appropriation and wastewater discharge.	Feb. 6, 2013 Letter, MDH to Winona County; Public comments and responses of Winona County; Dustman, Summit Envirosolutions for Goodhue County; EQB Final Report, p. 28: http://www.eqb.state.mn.us/documents/23.%20March%20Final%20Silica%20Sand%20report.pdf .
	Consultation of impaired waters list -- no mining within 1 mile of body of water on impaired water list.	Feb. 6, 2013 Letter, MDH to Winona County; Public comments and responses of Winona County; Dustman, Summit Envirosolutions for Goodhue County.
	Volume disclosure expressed in ratio of aquifer capacity, and consideration of cumulative impacts of process water and treatment.	Minn. Stat. 103G.265, Subd. 2; Minn. Stat. 116D.04, Subd. 16; Feb. 6, 2013 Letter, MDH to Winona County; Public comments and responses of Winona County; Dustman, Summit Envirosolutions for Goodhue County.
	Protocol for monitoring, testing for flocculant and other contaminatin, and documentation of haul back material to prevent contamination. Groundwater surrounding mines and processing plants tested at lest monthly, controlled by state and project assessed for costs.	Feb. 6, 2013 Letter, MDH to Winona County; Public comments and responses of Winona County; see Dustman, Summit Envirosolutions p. 34-53.
(i) applicable groundwater and surface water appropriation permit requirements	Groundwater appropriation permit - assessment of water resources available for appropriation to be provided by DNR, and identification of sustainable rate of appropriation, with safety factor, required.	Minn. Stat. 103G.265, Subd. 2; Minn. Stat. 116D.04, Subd. 16; Feb. 6, 2013 Letter, MDH to Winona County; Public comments and responses of Winona County; Dustman, Summit Envirosolutions for Goodhue County; State draining water supplies as nature can't keep up with demand, Feb. 28, 2013 (http://m.startribune.com/news/?id=192783461)
	Zero liquid discharge (ZLD); treatment and reuse; discharge. No injection wells or injection of waste allowed.	
	Update well location maps; comply with well sealing protocol	Feb. 6, 2013 Letter, MDH to Winona County; Public comments and responses of Winona County
(ii) well sealing requirements	After baseline levels, periodic testing, well data is to be submitted annually in an accessible format, such as Excel or WORD, and promptly posted on agency and county website.	Feb. 6, 2013 Letter, MDH to Winona County; Public comments and responses of Winona County

Minn. Stat. 116C.99

(iii) annual submission of monitoring well data	Groundwater surrounding mines and processing plants tested at least monthly, controlled by state and project assessed for costs. Results shall be tracked through public posting and monthly review by independent consultant, costs to be assessed to project.	Feb. 6, 2013 Letter, MDH to Winona County; Public comments and responses of Winona County; Dustman, Summit Envirosolutions for Goodhue County.
(iv) storm water runoff rate limits not to exceed two-, ten-, and 100-year storm events		
(4) Air Monitoring and data submission requirements		
General Health Concerns	Application of ambient air quality standards for silica dust to mines, processing, and haul routes. Conduct Air Emissions Risk Analysis (part of MPCA's analysis in air permit review) and begin Community Air Improvement Project for affected communities. There is to be no measureable deterioration of air quality and no increases in ambient levels of silica dust or diesel exhaust.	Health Concerns with Frac Sand Mining - Minnesota Dept. of Health: http://www.mehaonline.org/sites/default/files/meha/documents/Health%20Concerns%20with%20Frac%20Sand%20Mining_0.pdf ; Students measure city (Winona) air quality, Winona Post: http://www.winonapost.com/stock/functions/VDG_Pub/detail.php?choice=51648&home_page=&archives= ; Environmental committee calls for diesel exhaust, silica dust air monitoring -- now, Winona Post: http://www.winonapost.com/stock/functions/VDG_Pub/detail.php?choice=54542&home_page=1&PHPSESSID=c489d7fdc22dc68f83554355d2e58161 ; MPCA Community Air Improvement Project: http://www.pca.state.mn.us/index.php/air/air-monitoring-and-reporting/air-emissions-modeling-and-monitoring/community-air-improvement-project-caip.html
Minnesota Department of Health	Dept of Health to adopt an air quality health-based value for silica sand (Minn. Stat. 116C.991); The MPCA has requested that MDH develop a short-term exposure limit for respirable crystalline silica in air. (p. 21, EQB Report)	Minn. Stat. 116C.991; EQB Final Silica Sand Report, March 23, 2013: http://www.eqb.state.mn.us/documents/23.%20March%20Final%20Silica%20Sand%20report.pdf
Air monitoring - silica dust	Air monitoring at mine, processing and transfer sites, property lines, along haul routes every 2 miles in rural areas, and ever 1/4 mile in residential areas -- silica sand is carcinogenic. There is to be no measureable deterioration of air quality and no increases in ambient levels of silica dust.	WHO-IARC, Volume 68 Silica http://monographs.iarc.fr/ENG/Monographs/vol68/volume68.pdf ; Health Consequences of Energy Choices: Risks from Frac Sand Mining for Oil and Gas Extraction (); Lidar characterization of crystalline silica generaiton and transport from a sand and gravel plant (Trzepla-Nabaglo 2006)(http://www.ncbi.nlm.nih.gov/pubmed/16442218).

Minn. Stat. 116C.99

Air monitoring - diesel exhaust	Air monitoring of diesel exhaust at mine, , processing and transfer sites, property lines, along haul routes every 2 miles in rural areas, and ever 1/4 mile in residential areas, property lines, along haul routes -- diesel exhaust is carcinogenic. There is to be no measureable deterioration of air quality and no increases in ambient levels diesel exhaust.	IARC Press Release - Diesel exhaust Group 1 Carcinogen: http://www.iarc.fr/en/media-centre/pr/2012/pdfs/pr213_E.pdf ; Carcinogenic Effects of Exposure to Diesel Exhaust, CDC: http://www.cdc.gov/niosh/docs/88-116/ ; EPA Integrated Risk Information System, Diesel engine exhaust: http://www.epa.gov/iris/subst/0642.htm#woe
	Cumulative impacts; cumulative potential effects	Minn. R. 4410.1200, 4410.2300, item H, and 4410.3610, subpart 4; see also Minn. R. 4410.4400, Subp. 1.
	Offsite ambient air standard to be developed for general public. Pending establishment of offsite air standard by the State of Minnesota, the lowest standard established in any United States or other jurisdiction shall be the applicable standard. If standard is lowered elsewhere, the Minnesota standard shall be lowered accordingly.	MPCA Rulemaking related to silica sand projects, Minn. R. 7001, 7007, 7009, 7011, 7017, 7050, et seq.
	MPCA Air Permit -- agency requires funding to monitor and enforce.	MPCA Rulemaking related to silica sand projects, Minn. R. 7001, 7007, 7009, 7011, 7017, 7050, et seq.
	Ambient air monitoring shall be continuous, performed and controlled by the MPCA and project shall be assessed for cost of monitoring. Air monitoring shall be performed at the property boundary with at least four monitors positioned at the four highest velocity wind locations based on the area windrose. Results shall be tracked through public posting and monthly review by independent consultant, costs to be assessed to project.	MPCA Rulemaking related to silica sand projects, Minn. R. 7001, 7007, 7009, 7011, 7017, 7050, et seq.
	Continuous ambient air monitoring shall be performed for silica dust -- PM2.5 concentrations generally and for crystalline silica concentrations specifically. A sufficient number of air monitoring sites shall be established on the boundaries of the mining and/or processing property that a monitor is effectively "downwind" of dust generation activities at all times. Mining and processing operations shall only be carried out while "downwind" continuous air monitors are operational.	MPCA Rulemaking related to silica sand projects, Minn. R. 7001, 7007, 7009, 7011, 7017, 7050, et seq.' see above.
	Output of continuous air monitoring equipment shall be made available to the public in real time via the internet. Concentrations reported to the public, the media, and for regulatory purposes shall be the highest concentrations detected, not "averages" of multiple monitoring sites.	See above.

Minn. Stat. 116C.99

	Pending establishment of a health-based ambient air concentration standard by the State of Minnesota, the lowest standard established in any United States or other jurisdiction shall be the applicable standard. If standard is lowered elsewhere, the Minnesota standard shall be lowered accordingly.	See above.
	Exposure guidance and limits for various types of exposure, i.e., workers, neighbors, organic and other farms, livestock..	OSHA, MHSA; see also MPCA Rulemaking related to silica sand projects, Minn. R. 7001, 7007, 7009, 7011, 7017, 7050, et seq.; see above
(5) Dust control requirements		
	Conduct Air Emissions Risk Analysis (part of MPCA's analysis in air permit review) and begin Community Air Improvement Project for affected communities.	WHO-IARC, Volume 68 Silica http://monographs.iarc.fr/ENG/Monographs/vol68/volume68.pdf ; Health Concerns with Frac Sand Mining - Minnesota Dept. of Health: http://www.mehaonline.org/sites/default/files/meha/documents/Health%20Concerns%20with%20Frac%20Sand%20Mining_0.pdf ; Students measure city (Winona) air quality, Winona Post: http://www.winonapost.com/stock/functions/VDG_Public/detail.php?choice=51648&home_page=&archives= ; Environmental committee calls for diesel exhaust, silica dust air monitoring -- now, Winona Post: http://www.winonapost.com/stock/functions/VDG_Public/detail.php?choice=54542&home_page=1&PHPSESSID=c489d7fdc22dc68f83554355d2e58161 ; MPCA Community Air Improvement Project: http://www.pca.state.mn.us/index.php/air/air-monitoring-and-reporting/air-emissions-modeling-and-monitoring/community-air-improvement-project-caip.html
	Fugitive emissions	See Laws 2013, Chapter 114, Article 4, Section 107, regarding fugitive emissions, Minn. R. 7005.0100, Subp. 35a.
	Ambient off-site air standard shall be developed. Pending establishment of a health-based ambient air concentration standard by the State of Minnesota, the lowest standard established in any United States or other jurisdiction shall be the applicable standard. If standard is lowered elsewhere, the Minnesota standard shall be lowered accordingly.	MPCA Rulemaking related to silica sand projects, Minn. R. 7001, 7007, 7009, 7011, 7017, 7050, et seq.; but see Laws 2013, Chapter 114, Article 4, Section 107, regarding fugitive emissions, Minn. R. 7005.0100, Subp. 35a.

Minn. Stat. 116C.99

	Covering of trucks, railcars and barges required; covering of process functions such as loading; blasting dust control with water, chemicals (other means?).	County road agreement; MPCA Rulemaking related to silica sand projects, Minn. R. 7001, 7007, 7009, 7011, 7017, 7050, et seq.; but see Laws 2013, Chapter 114, Article 4, Section 107, regarding fugitive emissions, Minn. R. 7005.0100, Subp. 35a.
	Permitting shall require modeling that demonstrates compliance with air quality standards; baseline levels to be determined and no increase from baseline is permitted.	County road agreement; MPCA Rulemaking related to silica sand projects, Minn. R. 7001, 7007, 7009, 7011, 7017, 7050, et seq.; but see Laws 2013, Chapter 114, Article 4, Section 107, regarding fugitive emissions, Minn. R. 7005.0100, Subp. 35a.
	Watering, chemical treatment of roads, sufficient to keep dust at safe level at mining and processing property boundary and on haul routes. Pending establishment of this dust standard by the State of Minnesota, the lowest standard established in any United States or other jurisdiction shall be the applicable standard. If standard is lowered elsewhere, the Minnesota standard shall be lowered accordingly.	County road agreement; MPCA Rulemaking related to silica sand projects, Minn. R. 7001, 7007, 7009, 7011, 7017, 7050, et seq.; but see Laws 2013, Chapter 114, Article 4, Section 107, regarding fugitive emissions, Minn. R. 7005.0100, Subp. 35a.
	Mine shall be surrounded by berms at least 10 feet tall, and conifer trees at least 8 feet tall and sufficiently close to form continuous solid barrier to contain dust. Project responsible for maintaining berm and live trees.	County road agreement; MPCA Rulemaking related to silica sand projects, Minn. R. 7001, 7007, 7009, 7011, 7017, 7050, et seq.; but see Laws 2013, Chapter 114, Article 4, Section 107, regarding fugitive emissions, Minn. R. 7005.0100, Subp. 35a.
	Mine loading areas and processing unloading, processing, and loading areas shall be covered and utilize water and chemical treatment to minimize dust.	County road agreement; MPCA Rulemaking related to silica sand projects, Minn. R. 7001, 7007, 7009, 7011, 7017, 7050, et seq.; but see Laws 2013, Chapter 114, Article 4, Section 107, regarding fugitive emissions, Minn. R. 7005.0100, Subp. 35a.
	Mitigation plan for mining, processing and transportation dust.	County road agreement; MPCA Rulemaking related to silica sand projects, Minn. R. 7001, 7007, 7009, 7011, 7017, 7050, et seq.; but see Laws 2013, Chapter 114, Article 4, Section 107, regarding fugitive emissions, Minn. R. 7005.0100, Subp. 35a.
(6) Noise testing and mitigation plan requirements		
	Mining and processing activities shall be conducted within the MPCA's noise limits. Blasting (impulsive) noise shall at all times be lower than 50 dBA at the property boundary.	Minn. R. 6112.2900; Minn. R. 7030.0030 NOISE CONTROL REQUIREMENT; 7030.0040 NOISE STANDARDS; see also Dustman, Summit Envirosolutions p. 27-28
	Berm and trees, as above, for noise mitigation as well as dust mitigation.	

Minn. Stat. 116C.99

	<p>Mitigation plan -- see e.g. Dustman, p. 28</p> <ul style="list-style-type: none"> • Taking into consideration local receptors during preliminary and final design of the mine plan (because the excavation of sand and the creation of high walls can greatly reduce noise behind the wall, but may amplify noise in the opposite direction); • Leaving existing trees at the property boundary; • Building berms between noise sources and receptors; • Using strobe signals rather than audible systems for back-up alarms on heavy machinery (when permitted by the federal Mine Safety and Health Administration); • Enclosing generators and other mobile equipment; • Notifying nearby residents 48 hours prior to blast events; • Using vibration monitors with sensors capable of measuring three mutually perpendicular peak particle velocities, with the peak particle velocity being the largest of these measurements; and • Installing continuous noise monitors that meet the specifications in American National Standards Institute S1.4-1983. 	<p>Dustman, Summit Envirosolutions p. 28</p>
<p>(7) Blast monitoring plan requirements</p>		
	<p>Blast Monitoring Plan shall include project specific requirements requested by permitting agency, and shall include: 1) Describe the anticipated blast process;</p> <p>2) Discuss industry standards and establish standards in terms of acceptable limits of ground vibrations and air blasts established to provide protection to infrastructure and structures;</p> <p>3) Establish a monitoring program for the project that will provide the framework for documentation of the existing condition of adjacent structures, set forth blasting standards protective of structures and infrastructure adjacent to the site, establish monitoring as a means to collect ground vibration and air blast data, establish a schedule for submission of independent experts analysis and their expert opinions on the process that can be submitted to the County and the RGU for review; develop contingency actions to be followed in the event a blasting standard is not achieved, including but not limited to revocation of the permit.</p>	<p>Minn. R. 6112.2900; see Scott County Blast Monitoring Plan: http://www.co.scott.mn.us/ParksLibraryEnv/Environment/EnvReview/greatplainsminingaw/Documents/GPS%20Draft%20Blast%20Monitoring%20Plan.pdf; see also Dustman, Summit Envirosolutions, p. 27-28.</p>
<p>(8) Lighting requirements</p>		
	<p>Lighting shall be downward lighting, and mine, processing and transfer facilities shall not operate after dusk. Permit Application shall provide lighting plan with application for approval by permitting agency.</p>	<p>Local permitting, EIS Minn. Stat. Ch. 116D (MEPA).</p>

Minn. Stat. 116C.99

(9) inspection requirements		
	In sync with state and federal agencies, MSHA, OSHA	
	Assure permittee is in compliance with permitting conditions, with active enforcement, and if non-compliant, project to be assessed fines and costs of enforcement.	See permit for conditions
	Full funding for inspection agencies and local governments	
(10) Containment requirements for silica sand in temporary storage to protect air and water quality		
		NIOSH on silica sand hazards: http://www.cdc.gov/niosh/docs/2004-108/pdfs/2004-108.pdf
(11) containment requirements for chemicals used in processing		
	Identification/disclosure of chemicals to be used and their degradation products -- the range of chemicals expected would include: Hydrochloric Acid, Ammonium Chloride, Isopropanol/formic acid, Polyacrylamide, Polydadmac, Methanol and/or Ethylene Glycol, Guar Gum, Petroleum distillate, Biocide (eliminates bacteria in the water that produces corrosive by-products ,Corrosion inhibitor/winter stabilizer, Friction reducer, Gelling agents	Depends on sand resource: p. 9, Frac Sand Mining & Use, Green & Brown: http://wcrpc.org/Frac_Sand/Gen_Info_Comp_Reports/fracsand-green-brown-uwex.pdf
	Containment Plan	
(12) Financial assurance requirements		
	Preliminary projection of costs for reclamation and decontamination to be included with any permit application.	
	Individual liability, no limited liability	Pollution worries abound in frac sand waste streams, Strib: http://m.startribune.com/news/?id=215335701&c=y
	Post bond sufficient to cover all damages and costs associated with any possible calamity or disaster.	County development agreement; permit condition; Pollution worries abound in frac sand waste streams, Strib: http://m.startribune.com/news/?id=215335701&c=y
	Decommissioning fund with County	County development agreement; permit condition; Pollution worries abound in frac sand waste streams, Strib: http://m.startribune.com/news/?id=215335701&c=y

Minn. Stat. 116C.99

(13) Road and bridge impacts and requirements		
	Not to exceed design capacity of roads (average daily trips as established by MnDOT), observe seasonal weight limits, local road usage fees.	MnDOT design capacity
	Development agreement between permittee and DOT and/or local government with jurisdiction over roads designating haul routes, daily trip limits.	See e.g., Goodhue County road agreement for wind projects
(14) Reclamation plan requirements as required under the rules adopted by DNR		
	Ongoing reclamation, replacing overburden with haul back material as active mine site moves. Protocol for monitoring, testing for flocculant and other contamination, and documentation of haul back material to prevent contamination.	Feb. 6, 2013 Letter, MDH to Winona County; Public comments and responses of Winona County; see Dustman, Summit Envirosolutions p. 34-53.
	Financial assurance for reclamation, and reclamation shall restore to condition at least equivalent to previous use.	
	See DNR rules in development... no mining operation shall be permitted until DNR rules promulgated.	Minn. Stat. 116C.99