August 21, 2016

Wisconsin DNR ISM SA Coordinator
OB/7P.O. Box 7921,
Madison, WI 53707-7921

Re: Comments on Draft Industrial Sand Mining Strategic Analysis

Dear ISM Strategic Analysis Coordinator and Board Member:

I recognize that a lot of work went into preparing the draft Strategic Analysis. Thank you for your collective work. I am, however, concerned over some areas that directly affect communities and residents that received insufficient attention as part of the study. Without making the effort and taking the time to address these issues, the strategic analysis is incomplete and misleading to the public and elected officials most impacted.

- Less than one page discusses quality of life of those proximal to the mine. The slant is clearly towards the property values of mining facilities, rather than the property value impacts to nearby commercial and residential properties. Who wants to buy an elegant $250,000 home across the road from a proposed mine location. What happens to these ill retirees who sank their future into (then) projected property values? Like many of us in similar situations, they chose to live 'in the country' to avoid impacts associated with heavy industry: traffic, noise, light pollution, and air quality insults.

- Though diesel impacts of trucking are non-trivial, the most significant air quality issue-- particulate matter--is inadequately addressed. The Strategic Analysis references the 2016 Health Impact Assessment (HIA) from the Institute for Wisconsin's Health. This assessment relied heavily on industry-sponsored data & studies and does not adequately address the risks to mine employees and nearby residents from fine particular matter (PM2.5). Nor does it speak to the U.S. EPA's objections regarding how the State of Wisconsin addresses PM2.5.

- Protections and strategies for surface and groundwater are unclear—including dealing with stormwater and wastewater monitoring-- even in the face of referenced water quality risks and DNR sampling that suggests that acid mine drainage at some sites may already be happening.

- The Strategic Analysis fails to address the reality of local permitting, reclamation planning and related costs to local citizens & governments. Insufficient expertise & permit applications leave the general public without sufficient information to provide informed comment on often inadequate proposals and plans. Worse, the Strategic Analysis fails to address the bonding loophole in State Statutes that could allow a mining company to walk away before reclamation is completed leaving the State, County, and/or local to cope with the mess. There needs to be a harder look at weaknesses and stronger guarantees that reclamation will occur as planned.

I strongly believe that WDNR needs to address the above questions and provide additional opportunities for public input once the revisions are completed. There are no do-overs. We—you—must get it right for the future of the folks, flora, & fauna who stand to lose in the scenarios as currently put forward.

Sincerely,

[redacted]
[redacted]
Fairchild, WI 54741

WISA
WISCONSIN INDUSTRIAL SAND ASSOCIATION

August 22, 2016

Mr. Dave Siebert
Wisconsin Department of Natural Resources OB/7
P.O. Box 7921
Madison, WI 53707-7921

RE: **Industrial Sand Mining Strategic Analysis**

Dear Dave Siebert:

The Wisconsin Industrial Sand Association (WISA) is an organization formed to promote safe and environmentally responsible sand mining standards and practices. Open only to those companies that achieve membership in the WDNR Green Tier Program, WISA strives to further develop the data and scientific understanding that enable us to engage in fact-based discussions of the benefits and impacts of industrial sand mining in Wisconsin.

WISA is providing written comments in response to the draft Wisconsin Department of Natural Resources Industrial Sand Mining in Wisconsin Strategic Analysis. Our members and friends have provided the following key comments for your consideration:

Executive Summary

On page ii, the document states that currently 9% of all sand mines (or six mines specifically) are greater than 1,000 acres. We're concerned that by the way this section is written, it makes it seem that there are six sites within the state that are mining more than 1,000 acres of exposed sandstone, when in reality only small portions of the properties are used for mining and a large portion of the acreage is used as buffer property. For example, two of WISA's member companies are in the defined nine percent. The largest industrial sand mine in Wisconsin, Badger Mining's Taylor Sand Plant has over 4,000 acres, but only has approximately 440 acres of open pit acreage and total land used for processing sand.

Section 1.2.2 - Explanation of Hydraulic Fracturing

A detailed description of hydraulic fracturing is provided. Industrial silica sand is also used in many other industries such as the metals casting, filtration, glassmaking, etc. Those Wisconsin industries should also be spotlighted, as they are important end-users of our products. Also, by promoting hydraulic fracturing, we continue to provide misinformation to the public, making it sound like Wisconsin sand used for hydraulic fracturing is somehow different than Wisconsin sand used for other industries. In reality, what separates these sands is processing specifications.

Section 1.2.3 - Location of Sand Resources

There are some geologic inconsistencies with the following sentence. The sentence reads "frac sand specifications is found in the Cambrian, Jordan, Wonewoc, and Mt. Simon Formations." The Cambrian is not a geologic unit however the Cambrian is a geologic time period, all the units listed are Cambrian-aged sandstones. We suggest, "frac sand specifications are found in the Cambrian-*age*, Jordan, Wonewoc, and Mt. Simon Formations."

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In the analysis, Brown County is listed as a county with dolomite quarries. We are not aware of any dolomite quarries in Brown County, however, there are dolomite quarries in Waupaca and Outagamie counties.

Section 1.2.4 – Current Operations

In Table 1-2 *Current Industrial Sand Mine Totals*, we believe there are some misrepresentations in the number of facilities reclaimed. For example, Badger Mining's St. Marie Sand Plant is a reclaimed sand facility and not listed in the total.

Section 1.3.1 – Dry Mining

Under the Blasting subsection, we feel that it would be best to clarify that not every sand mining facility utilizes blasting techniques as part of its operation.

Under the Pumps and Washing subsection, it states, "To the extent possible, water will be conserved and recycled by means of a settling pond." However, not every facility utilizes this process to settle colloidal particles. Other facilities may use ultrafine recovery systems or clarifiers as a part of their wet processing. WISA feels this should be iterated in this section.

Section 1.3.6 – Transportation and Load-out Facilities

We believe that the type of rail car has been misrepresented. This section states, "Most of the rail cars being used are open-topped..." WISA believes that non-metallic mines that transport product do so in covered hopper cars. If sand is transported in open-topped cars it is done so as a wet product.

Under the Conveyor Systems subsection, it reads, "sand conveyed from the storage piles to further processing (transfer to dryers) is typically dry...." This narrative is misleading, stockpiled sand is considered to be "wet". Sand is sent to the dryer because it has a moisture content.

Section 2.1.1- Air Pollutants

Under the Particulate Matter subsection a description of fine particulates is described constituting the size faction $PM_{2.5}$. WISA appreciates this description and agrees with the Department's decision on $PM_{2.5}$ being a secondary formation pollutant and is not a likely source at Industrial Sand Mining. We also appreciate the description of PM_{10} monitoring in the reasoning smaller sized particles are not likely to be released in the ambient air.

Section 2.3.7- Metals

We are concerned that this section is misleading and based on assumptions from samples that were taken by the Department. Samples were taken from various ponds at ISM facilities and a total metal content was analyzed on grab samples. This is misleading because samples were taken from ponds of various purposes and Total Suspended Solids (TSS) was not tested in many cases. Testing for total suspended solids would reveal that high aluminum concentrations are a result of natural occurring clays in the process loop, which pose no greater threat to public water supply than if they were to remain undisturbed in the aquifer.

WISA supports research conducted by the Wisconsin Geologic Natural History Survey (WGNHS) and UW System.

Section 2.3.17 – Current Trends

WISA
WISCONSIN INDUSTRIAL SAND ASSOCIATION

We feel this section would benefit by providing some context regarding water withdrawal amounts state-wide. What percentage of withdrawals in the state are from industrial sand facilities? This information was presented in the Institute for Wisconsin's Health, Inc. Health Impact Assessment on Industrial Sand Mining in Western Wisconsin

Section 2.8.2 – Existing Forest Vegetation

WISA believes that this section is misleading. The section states, "If mines are located in a forested area, because of the nature of ISM, the structure, composition, and function of this ecosystem will change permanently from the existing state." We feel it should be stated that once the site is reclaimed, the area can be returned back to a forested area like the one that existed before the mine was constructed.

General Comments

As an organization that has strong ties to the scientific community, WISA values peer reviewed documents with proper references. WISA feels that the lack of scientific citations present in the Strategic Analysis is detrimental to the efforts on the document as a whole and that it would be in the Department's best interest to cite the sources from which the information was taken.

In addition, WISA members have read the public comments provided by Mark Krumenacher of GZA GeoEnvironmental, Inc.; we acknowledge and support many of his comments.

As stated, WISA appreciates and supports science-based regulations and the ability to comment and engage in fact-based discussions. We sincerely appreciate response and consideration in our comments as we believe they will have a significant impact on the final Strategic Analysis.

Best Regards,

Martin T. Lehman
President
Wisconsin Industrial Sand Association

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Midwest Environmental Advocates

July 29, 2016

Wisconsin Natural Resources Board
c/o Laurie J. Ross, Board Liaison
Office of the Secretary, Wisconsin DNR
PO Box 7921
Madison WI 53707-7921

Re: August 2016 Natural Resources Board meeting agenda item 4.A.1, Industrial Sand Mining Strategic Analysis update

Dear Natural Resources Board Members:

We appreciate the opportunity to submit comments to the Natural Resources Board (NRB) on agenda item 4.A.1. The Department of Natural Resources (DNR) will provide an update to the NRB on its draft Industrial Sand Strategic Analysis. The NRB directed the DNR to prepare this strategic analysis in response to a petition by over 1,000 Wisconsin residents and Midwest Environmental Advocates (MEA). On behalf of MEA, I submitted comments to DNR on the draft strategic analysis at DNR's public hearing on July 26 in Eau Claire, WI.

Our comments thanked DNR staff for devoting time and resources to preparing the strategic analysis, but also raised concerns about DNR's willingness to dismiss potential impacts without enough data. We asked DNR to follow the precautionary principle in analyzing potential impacts and regulating this industry. The precautionary principle is central to most of our federal and state environmental laws. It requires our environmental protection agencies to err on the side of protecting public health and the environment instead of giving industry free reign until we have irrefutable evidence of harm.

We respectfully request that the NRB ask DNR to answer the following questions about its draft strategic analysis. This information will help the public provide meaningful written comments on this issue. We hope that it will also allow the NRB to ensure a robust final strategic analysis.

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Why does DNR maintain that industries with primarily mechanical processes, like industrial sand mines, do not emit significant quantities of fine particulate matter (PM2.5) despite U.S. EPA's objections? DNR's conclusions that industrial sand mines and processing facilities do not pose a threat to air quality are based on insufficient evidence and conflict with the federal Clean Air Act. The U.S. EPA commented in opposition to DNR's recent guidance documents that change how it regulates PM2.5 emissions and presume that industrial sand mines do not emit PM2.5. *See* Attachment A. DNR's insistence that mechanical processes at industrial sand mines do not emit PM2.5 threatens air quality and falsely dismisses this industry's impact on air quality.

How and when will DNR study the potential impact to water quality from industrial sand mining heavy metal discharges to surface water and groundwater? DNR did the right thing by acknowledging a potential risk to water quality from industrial sand heavy metal discharges. DNR sampling of industrial sand stormwater and wastewater ponds has shown low pH and high concentrations of metals, which reflects potential acid mine drainage at these facilities. We appreciate DNR's decision to further study the potential harm to surface water and groundwater posed by heavy metal pollution. Because this is such an important public health and environmental concern, MEA requests that NRB ask DNR for more information about its proposal to study this issue.

Will DNR require facilities to monitor or limit heavy metal discharges in the industrial sand mining stormwater and wastewater general permit? DNR currently regulates discharges from industrial sand facilities through an industry-specific general permit. That general permit has expired, and DNR is currently revising and updating it before reissuance. Given that DNR has evidence of heavy metals in some facilities' ponds, DNR should require that all facilities monitor for heavy metals. This will provide DNR a better picture of the potential for heavy metal contamination, while also ensuring that harm is not occurring under the radar while DNR conducts further study. MEA requests that DNR explain how the proposed industrial sand general permit will protect water resources from heavy metal pollution.

Is reclamation planning consistently robust and thorough and is reclamation plan implementation consistently successful? Many of the public comments at the July 26 public hearing reflected concern about the reclamation process. DNR and the industrial sand industry minimize concerns about large-scale landscape destruction with assurances that the reclamation process will return the land to a productive use after mining is complete. But we already have anecdotal evidence that reclamation planning does not always proceed as planned, either because the company does not have the technical expertise or finances to fully implement successful reclamation. MEA requests that DNR provide additional information to the NRB to support its claims that reclamation planning is generally simple and easy to accomplish. These claims contradict experience on the ground both in Wisconsin and in other states that have dealt with open-pit mining reclamation for decades.

We also want to thank the NRB for responding to Wisconsin residents' concerns about industrial sand mining and approving the request for a strategic analysis. We appreciate

your ongoing attention to this issue and our state's valuable resources. Please contact me if you have any questions.

Respectfully,

/s/

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August 22, 2016

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Re: Comments on the June 2016 Draft Strategic Analysis of Industrial Sand Mining

Dear Ms. Walls and ISM SA Coordinator:

I reviewed the June 2016 Draft Strategic Analysis of Industrial Sand Mining (Draft Report) and offer general comments followed by specific comments to the Strategic Analysis.

GENERAL COMMENTS

1. Overall, the strategic analysis represents an in-depth review and an opportunity for the WDNR to provide an accurate and through analysis of industrial sand mining. More importantly, the Strategic Analysis should provide the opportunity for the WDNR to defend the state rules and regulations and proudly report that the potential impacts are understood and managed by the WDNR and other state staff.
2. The framework for an appropriate Strategic Analysis is there, but must be refined through an honest and thorough introspective and critical editorial and scientific review.
3. The document needs a professional editorial review that properly refocuses the tone and language of the various authors to be consistent with the intent of a Strategic Analysis as stated in Chapter NR150 below; specifically to report in a factual and dispassionate manner:

   > "Using available ecological and other **scientific** information, the analysis shall consider the alternatives and environmental effects in a dispassionate manner and may not advocate a particular position about alternatives." [**emphasis** added]

   Likely unintentional, the personal viewpoints of many of the contributing authors to the Draft Report is transparent and advocates nonscientific information and positions in a passionate manner. Many examples of this are pointed out in following comments.
4. For a technical document, the Draft is extremely light on "available ecological and other scientific information" and relies heavy on anecdotal comments, insinuation and assumptions that are not properly vetted or based on scientific analysis. There are essentially no technical citations to demonstrate that the authors have done the

proper research by listing sources used as sources of information and allow readers to make a careful and critical examination of the "fact" sources. The few citations that are included in the Draft Report are either not applicable or are inappropriately referenced as specifically noted in the comments below.

5. The initial WDNR Press Release included the following statements [emphasis added]

   - The DNR is calling on the public to help put together a document of facts about the frac sand mining industry.
   - The agency is compiling an industrial sand mining strategic analysis that will include science based facts about things like environmental and socioeconomic impacts.
   - To compile the document, the DNR will be looking at studies and tests that have been done over the years.
   - "The benefit here is we'll have a document that's based on factual information that anybody can use. Whether it's a county board, a town board, our legislature... Those policy and decision makers. We don't make the law, we implement the law so we hope to use this science, or these facts, by which to educate people and decision makers or lawmakers on whatever their interest is," Dan Baumann, the DNR secretary's director in West Central Wisconsin, said.

   The WDNR Press Release emphasizes "science based facts", "studies and tests", and "factual information" which is what is needed to provide the public with reliable, vetted information on a topic that is dominated by misinformation. Based on the Press Releases and requirements of Chapter NR 150, the expectation is that the Strategic Analysis will be a dispassionate, unbiased and fact based scientific report. I believe that a retrospective technical and editorial review and call to contributing authors to provide vetted scientific citations for essentially every fundamental statement in the document will provide the report was promised, expected, and needed.

6. Furthermore, personal opinions should be removed from the Draft. Only professional opinions that can be based on documented facts supported by appropriate technical citations should remain in the final Strategic Analysis. Every phrase, sentence and paragraph in the final Strategic Analysis must be supported in the document and ideally by appropriate technical citations. After publication of the final Strategic Analysis, every phrase and statement can be quoted and prefaced by others with "as reported by the WDNR…". Care should be taken to review and edit the final report with this in mind.

7. The WDNR is the preeminent natural resource scientific community in the state. So when the WDNR says that it will "put together a document of facts about the frac sand mining industry", "will include science based facts" and that "we'll have a document that's based on factual information that anybody can use" a science based factual document is the expectation with personal bias and opinions omitted.

8. The Draft Report makes statements about impacts to air, water, land, etc. as matters of fact without citations and not as 'potential' impacts. The Draft Report consistently relies upon negatively stated comments such as 'mining causes X' rather than clarifying that 'mining may cause X, but X is managed by Y' (BMPs, proper designs, plans, etc.) or that 'X is managed to avoid Y'. This writing style is prevalent and is inappropriate.

9. The Strategic Analysis should acknowledge that the potential impacts considered in the report are the same from almost all land development and agricultural activities and are not unique to industrial sand mining operations. Failure to acknowledge that fact greatly exaggerates the potential impact of industrial sand operations.

10. The wetland impacts section of the report provides a disproportional amount of detail relative to the actual and potential impacts industrial sand mining has had on wetlands. Seven pages of text with tables could more appropriately provide the relevant information in a paragraph at most. According to the report, 128 industrial

sand operations, with almost 34,000 acres permitted, have impacted a total of 8 acres of the state's 5.3 million acres of wetlands. As written, this section of the Draft report clearly does not meet the intent of Chapter NR 150.

11. The word "waste" is misused and exaggerated.

SPECIFIC COMMENTS

Executive Summary

1. Opening Section. The acreage should be reported as permitted acreage and not "mine site" acreage which gives the inappropriate impression that these mines are 100s and 1,000s of acres in size. It would also be appropriate to mention that the vast majority of mining properties remain in agriculture
2. Air Quality Section, opening sentence must be corrected. Crystalline silica has not been shown to be one of the "main air pollutants associated with industrial sand mining facilities". This statement is not scientific, not based on data, and is inappropriate in a scientific document.
3. Air Quality Section, second sentence should be edited or deleted as it is misleading reflecting bias. There may not be a "federal standard or federally approved monitoring method for crystalline silica" but there are scientifically valid testing methods using USEPA certified equipment and methodologies.
4. Groundwater Section, opening sentence second paragraph is misleading as written and should be deleted or revised to reflect that infiltration of stormwater is generally preferred and encouraged as "the recommended Best Management Practice" (BMP) and not imply that it is an inappropriate or undesirable practice.
5. Groundwater Section, second sentence of second paragraph is misleading as written and should be revised to eliminate the unscientific and unverified bias inherent in the way it is written. The sentence should be reworded to say "In the summer of 2016, the department will convene a team of stakeholder experts to direct new research ~~regarding possible linkages to increased concentrations of~~ [**to evaluate]** dissolved metals in groundwater at ISM pond sites." There are no documented "increased concentrations of dissolved metals in groundwater at ISM pond sites" that a study is being convened to evaluate "possible linkages" to.
6. Surface Water Section, second sentence of second paragraph is misleading as written and should be revised as follows to reflect reality instead of providing a biased and inappropriate negative connotation: "Construction of certain aspects of ISM facilities may have [**engineered, permitted and environmentally protective]** waterway impacts due to stream crossings and grading near waterways." As written, the Draft implies that the stream crossings and grading near waterways are uncontrolled.
7. Surface Water Section should acknowledge that the primary water pollutant of concern near every land development site and agricultural field in Wisconsin is earthen materials that [may] result in total suspended solids. This is not unique to mine sites as the Draft report implies.
8. Agriculture Section should acknowledge that the majority of permitted mine acreage remains in agriculture use.
9. Local and State Economy Section. The sentence "There is currently no reliable method to measure the secondary impacts for jobs surrounding the recent growth of the industry." should be deleted. If it is the intent of the WDNR to report on the economic impact of the industry, then there should be some effort to utilize economists to provide factual information on the topic. For example, the Regional Input-Output Modeling System (RIMS II) multipliers produced by the Regional Product Division of the Bureau of Economic Analysis (BEA) should be acquired.

10. Property Values Section, third sentence should be deleted. The statement as written is an uninformed opinion, is not based on facts or data, and does not belong in a scientific report. Research the topic and gain an awareness that there are no studies to verify that statement and that the value of nearby residential properties may actually increase or not change at all due to the close proximity of mine facilities. I have researched this issue for years, and while isolated properties may experience a decrease in property values there is no evidence that widespread or community property values are negatively impacted.

Section 1 Introduction to Industrial Sand Mining

11. Section 1.2.2, second sentence must be revised. Although this section was apparently copied directly from an uncited source, the facts should be researched and reality portrayed appropriately. The hydraulic fracturing media is not equal parts "water, "frac sand", and chemicals" as implied. Sand and water make up 99 percent of the hydraulic fracturing fluid and a variety of additives, not necessarily chemicals, make up the remaining approximately 1 percent.
12. Section 1.2.4, third sentence. The report should acknowledge that most permitted land remains in agricultural use.
13. Section 1.3, fourth sentence must be revised. Mining methods include processing to sort the sand grain sizes but with the unique exception of magnetic treatment to remove iron, the sand processing operations do not remove impurities. The processing produces fine grained and coarse grained non-marketable materials comprised of clay, silt, sand and gravel size fragments of sandstone that are used in reclamation. "Impurities" are not used in mine reclamation.
14. Section 1.3.1, Land Clearing and Overburden Removal, third paragraph, last sentence. Stormwater does not run, Usain Bolt runs. The sentence should be modified to reflect that berms provide a barrier to stormwater flowing <u>within</u>, <u>onto</u> and off a property.
15. Section 1.3.1, Excavation, sixth paragraph, second last sentence (page 1-8). This is an example of improperly focused wording and should be changed to "Although the occurrence of wetlands and surface water bodies is unlikely in these hills, and the targeted rock units are generally unsaturated by groundwater, bench mines do require the disturbance of steep slopes which increases erosion potential [**that is managed by design and construction of appropriate erosion controls and BMPs**]. These types of issues are not new or unique to mining and are managed at all land development projects by state rules, regulations and the WDNR.
16. Section 1.3.1, Blasting, second sentence. This is an example of unverified opinion written with negative wording and should be reworded to reflect the reality that "Blasting ~~practices can result in~~ [**operations manage**] noise, vibration, and fugitive dust emissions [**as required by Wisconsin laws to limit impacts on neighbors**]. There is no justification to write this Strategic Analysis in such a negative misleading manner.
17. Section 1.3.1, Stockpiling, second paragraph, first sentence must be deleted or reworded. This is another example of negative, nonscientific writing that is not based on factual information or appropriate to a scientific report. Suggested rewording: "Stockpiles containing fine-grained ~~waste~~ materials are [**managed to avoid**] ~~prone to~~ instability and runoff problems[.]~~,especially those that have been combined with flocculants.~~ The last statement "especially those that have been combined with flocculants" is especially troubling as to why it would be included in a technical report.
18. Section 1.3.1, Stockpiling, second paragraph, second sentence is another example of negative misleading writing that can be more appropriately worded "These problems ~~can be~~ [**are most commonly**] addressed by the timely incorporation of these materials into reclamation areas,"

19. Section 1.3.3, Processing-Related Additives and Chemicals, second paragraph, second sentence is out of place and implies that "Coatings (such as resins), finishing products, cleaning agents, and/or surfactants may also be used in processing" included in the first sentence are 'wastes".

20. Section 1.3.4 Process water and stormwater management, first sentence. This section should provide proper perspective that the 14.5 million acres of agricultural fields that are tilled annually do not have the same degree of stormwater management that is required at mining sites. Proper perspective is important.

21. Section 1.3.5, Spill prevention and response, Process, second sentence should be deleted as it is not true or necessary and must be a carryover from some other report. The cleaning solvents used at industrial sand mining processing is water, and there is very little paint used.

22. Section 1.3.5, Waste Management, first paragraph over uses the word waste and should clarify that the 'waste' is actually soil and bedrock particles that are mined but not shipped off the site.

Section 2 Environmental Topics

23. Section 2.1 Air Quality, first paragraph, last sentence should clarify who has raised the "concerns about particulate matter… concerns about carcinogenic hazardous air pollutants like crystalline silica and diesel exhaust." The industrial sand industry has been concerned about these issues for almost 100 years, so these are not new issues. Is it the WDNR that is concerned?

24. Section 2.1.1 Air Pollutants, first sentence should delete the words "and crystalline silica". Whereas the MEA may believe this to be a statement of fact, the WDNR and the industrial sand industry knows that crystalline silica is not 'the main air pollutants associated with industrial sand mines". This statement must be an oversight.

25. Section 2.2, Waste management, entire paragraph must be reworded to reflect reality as in Section 1.3.5.

26. Section 2.2.1, Hazardous Waste does not address hazardous waste generated at industrial sand mines. If there is none, then why not report that? The first sentence should clarify "Hazardous materials on industrial sand mine sites are generally limited to heating fuels, heavy equipment fuels and machinery maintenance products [**which are not hazardous waste**].

27. Section 2.2.1, Hazardous Waste, last sentence is not applicable, must be a carryover from some other report, and should be deleted.

28. Section 2.2.2 Non-Hazardous Waste, paragraphs 2, 3, and 4 over use the word "waste".

29. Section 2.2.2, paragraph 5 describing biological or chemical processed wastes should be deleted or the relevance described in detail with appropriate scientific data to verify.

30. Section 2.3.8 Polyacrylamides, last sentence. If the fate and transport of residual acrylamide is clearly documented in research, why does the WDNR not believe the scientific data and believe that "More research may be needed to determine if concentrations of acrylamide in industrial sand wash water and waste sludge are high enough to impact groundwater when mines are using polyacrylamide polymer as a flocculant."? The WDNR has been provided with numerous technical papers on acrylamide and have chemists that can interpret the facts for the Strategic Analysis. Why are they being ignored and the risks exaggerated when the Strategic Analysis is the opportunity to provide science based facts?

31. Section 2.3.17 Current Trends, second paragraph, should be emended to accurately report that although "The average ISM site is capable of withdrawing 1,800,000 gallons per day." None of the industrial sand operations actually withdraw groundwater at that rate. The report should be clear that the published pumping rates are permitted rates and not actual pumping rates.

32. Section 2.4.1 Surface Water Resources Introduction, second paragraph is not applicable and should be deleted or reduced to a sentence or two. As stated in the Executive Summary and Section 2.4.4 "As of the date of this report, no industrial sand mines have been authorized to mine sand material from the bed of any lake or stream."

33. Section 2.4.1, fourth paragraph is a theoretical discussion based on unverified and inapplicable opinions unrelated to the 128 permitted industrial sand operations in the state and should be deleted or at least properly cited and clarified.

34. Section 2.4.2, fourth paragraph, second sentence is another inappropriately worded negative statement. Besides for being poorly written with use of the words "may include" it should be more appropriately reworded to apply to actual practices in that "Discharges from nonmetallic mining operations [**are managed to limit or prevent**] ~~include~~ sediment, …"

35. Section 2.4.2, fourth paragraph, last two sentences must be reworded to reflect current practices and not imply changes that are needed; "For other pollutants, such as metals, residual water treatment additives, petroleum products, etc., source area pollution prevention practices are ~~needed~~ [**implemented**]to minimize contamination and mixing with the wastewater and stormwater. However, treatment best management practices may also be ~~needed~~ [**implemented**] if contamination cannot be prevented.

36. Section 2.4.2 Wastewater Pollutant Discharges, first paragraph, third sentence should be edited to reflect reality; "The primary [**potential**] pollutants associated with mining sites are …".

37. Section 2.4.2 Wastewater Pollutant Discharges, last paragraph should clarify that the samples collected from the ponds were not filtered and contained varying amounts of fines and therefore the analytical results do not represent water quality that could infiltrate through the pond walls, underlying soil and into the aquifer.

38. Section 2.4.2 Wisconsin's Nonmetallic Mining Operations General Permits, first paragraph, third sentence. Why is WDNR "choosing to regulate industrial sand operations separately" because some of the sand is "for use in the hydro-fracking industry"? Also, what is intended by the statement "and the level of potential wastewater volume and associated treatment."?

39. Section 2.4.4 Regulations and Permit Process, second from last paragraph, first sentence, should be modified to; "Activities conducted by NMM operations ~~are generally~~ [**may be**] subject to the waterway general permit …".

40. Section 2.5 Wetlands provides a disproportional amount of detail relative to the actual and potential impacts industrial sand mining has had on wetlands. Seven pages of text with tables Seven pages of text with tables could more appropriately provide the relevant information in a paragraph at most. According to the report, 128 industrial sand operations, with almost 34,000 acres permitted, have impacted a total of 8 acres of the state's 5.3 million acres of wetlands. As written, this section of the Draft report clearly does not meet the intent of Chapter NR 150.

41. Section 2.5.5, second paragraph, second last sentence exaggerate reality and should be deleted or rewritten to provide an honest analysis. If it is in fact true that 128 industrial sand operations with almost 34,000 acres permitted have a net impact of 8 acres of the state's 5.3 million acres of wetlands, then it is clearly inappropriate to state that "the industry has the potential to contribute to significant cumulative impacts to wetlands regionally.". This statement is an unverified opinion that clearly does not take the available ecological and other scientific information and consider the environmental effects in a dispassionate manner.

42. Section 2.5.5, second paragraph, last sentence is a continuation of the previous exaggerated thought process and should be deleted. This statement is illogical given the extent of wetland impact from 128 industrial sand operations.

43. Section 2.5.7 Current Trends, first paragraph. If the reported data is true, why should this report devote more than a paragraph to exaggerating the impacts? Section 2.5, more than most, does not take the available ecological and other scientific information and consider the environmental effects in a dispassionate manner.
44. Section 2.5.7 fourth paragraph, first sentence should be deleted or reworded; there are no "large-scale wetland impacts".
45. Section 2.5.7, last two paragraphs and three tables should be deleted in their entirety. There is no reason to exaggerate the impacts on wetlands as if it is relevant.
46. Section 2.6 Fish and aquatic species. Clearly this section does not provide an appropriate analysis and was not reviewed, properly vetted and should either be deleted or rewritten.
47. Section 2.6 more than most, like 2.5, does not take the available ecological and other scientific information and consider the environmental effects in a dispassionate manner.
48. Section 2.6 does not provide an analysis of the impact of industrial sand mining on Potential Fisheries and Aquatic Species Effects. Instead this section provides a cut and pasted summary with inappropriate references to an irrelevant study.
49. Section 2.61 Introduction is misleading in its message and no conclusion is provided to verify the introductory comment. "Nonmetallic mining in Wisconsin has not had any known significant negative impacts to fisheries resources in the past. This has mainly been attributed to the relatively low number of sand mines in the state. However, with the recent increase in ISM, the number of nonmetallic mines in Wisconsin has increased at a rapid rate, and in many instances, these mines are located close to coldwater resources or in the floodplains of river systems." So there has been no impact historically and now that there are 128 operations what can the WDNR report? Apparently nothing more.
50. Section 2.6.2. Potential Fisheries and Aquatic Species Effects, first paragraph, second sentence. Somebody other than me should review the Kanehl and Lyons (1992) study that focused on impacts of in-stream sand and gravel mining. How many of the 128 industrial sand operations are in-stream? Additionally, what difference does it make that the inappropriately referenced report was prepared "before the current expansion of industrial sand mining"?
51. Section 2.6.2 first paragraph, last sentence. What is the applicability of the "… large body of research related to sedimentation and dredging due to other factors such as agriculture and dam removal (Kanehl and Lyons 1992, Waters 1995)."?
52. Section 2.6.2 second paragraph fist sentence should replace "Sand mining" with "all land development".
53. Section 2.6.2 second paragraph, second sentence should be deleted for obvious reasons.
54. Section 2.6.2 second paragraph, third sentence is ridiculous, every land use in Wisconsin "occurs on plains or hills near streams".
55. Section 2.6.2 second paragraph, fourth sentence refers to "this action" which must be referring to Industrial sand operations. There is no evidence that to justify the exaggerated statement.
56. Section 2.6.2. last two sentences provide two additional inappropriate references to a study that does not apply and should be deleted.
57. Section 2.6.2 bullets need to be deleted, incorporated into an appropriate strategic analysis of Potential Fisheries and Aquatic Species Effects or at a minimum edited as follows:

a. Runoff from ~~the mine site and settling ponds~~ [**any agricultural or land development**] into a stream causing high levels of turbidity especially in headwater streams where there is natural reproduction of trout. Suspended sediment can lead to reduced feeding due to loss of ability to see food.

b. Runoff from ~~the mine site and settling ponds~~ [**any agricultural or land development**] causing sedimentation in stream channels reducing important pool habitat for adult fish cover, covering coarse substrate needed to invertebrate production and fish spawning.

c. If sedimentation/turbidity occurs [**any agricultural or land development**] during fall spawning/incubation period, sedimentation would cover/suffocate eggs, leading to a decrease in reproduction for that year.

d. Potential [**release**] of ~~processing~~ chemicals [**from any agricultural or land development]** ~~(see section 1.3.3)~~ to bioaccumulate in the fish or directly cause harm to fish and cause a fish kill.

e. Amount of warm water runoff from ~~settling ponds~~ [**any agricultural or land development]** could potentially increase the water temperature of coldwater resources, especially those with marginal temperatures for supporting a coldwater fishery.

f. Warmer water temps could cause intolerant species of fish and invertebrates to disappear.

g. ~~Increase of h~~[**H**]igh capacity wells near trout streams could negatively impact the water table which could decrease stream base flows. This in turn could impact natural reproduction or temperature of the stream.

h. Reduced spring volume could also have thermal impacts on streams.

~~i. Entrapment of fish in ponds located within a floodplain.~~

j. Conversion of riverine or stream habitat to a lake habitat in cases where bed excavation/enlargements and realignments of channels occur.

58. Section 2.6.2 second last paragraph, first sentence should be modified: “Fisheries monitoring protocols do not currently include any methods to assess the impacts of ~~mines~~ [**most land development activities**] on fish and aquatic species.

59. Section 2.6.2 photos should be deleted or accompanied by photos of the same streams following a heavy rain. This section needs to use available ecological and other scientific information and consider the environmental effects in a dispassionate manner.

60. Section 2.7, second paragraph should provide a more honest analysis and acknowledge that the statements hold true for all land development. The paragraph appears to have been copied from another report and “ISM” inserted for ‘big box store’, or ‘yet another crappy chain restaurant’.

61. Section 2.7, like other sections, is written to be negative and provide a connection to a problem or concern that does not exist at any significant scale. This section does not take the available ecological and other scientific information and consider the environmental effects in a dispassionate manner.

62. Section 2.7.2 first paragraph, last sentence should be deleted for two reasons: 1) as stated in the sentence, “this potential appears to be low” and 2) is the WDNR honestly aware of industrial sand operations that “have erosion or waste material run off”?

63. Section 2.7.2 third paragraph, first sentence should be modified “Karner blue butterflies (KBB) and cave bats are the listed species ~~that can be impacted by~~ [**in areas of**] ISM development and operations.” This section should acknowledge that there is nothing unique about mining relative to agricultural activities, timber cutting and residential development that may impact these listed species.

64. Section 2.7.3, first paragraph, third sentence, may be true but should be deleted. It is inappropriate without clarification and acknowledgment that the words "surface mining in ISMs" and "mine's" are simply fill-in-the-blank words for 100% of all land development; without exception, which means your residence, place of employment and roads traveled between the two. Suggesting that somehow industrial sand mining operations are somehow unique is another example of failure to keep the Strategic Analysis dispassionate.

65. Section 2.7.3, first paragraph, fourth sentence is another example of failure to keep the Strategic Analysis dispassionate and recognize and report the obvious facts. The statement implies that all industrial sand operations are sited on pre-European settler habitat, which is a fantasy. The report fails to acknowledge, with perhaps rare exceptions (although not aware of any), that the industrial sand operations are sited on land converted long ago to agricultural use as managed forests, crop land or pasture, not a native ancient ecosystem.

66. Section 2.7.3 Natural Communities. The report should acknowledge that the industrial sand mining operations have no greater impact on the 39 natural communities summarized in the report than do the agricultural, commercial, industrial, residential, transportation, or other land uses in the vicinity.

67. Section 2.7.3 Significant Ecological Places. The report should acknowledge that the industrial sand mining operations have no greater impact on the significant ecological places summarized in the report than do the agricultural, commercial, industrial, residential, transportation, or other land uses in the vicinity.

68. Section 2.7.4. Potential Impacts to Wildlife, fourth paragraph, first sentence should replace "ISM" with "All land development".

69. Section 2.8.1 Forest Resources Introduction, first sentence should be deleted. There is no justification or basis for the statement and implies that tree cutting at an industrial sand operation has a unique impact forest resources.

70. Section 2.8.2, first paragraph has no meaning, provides no new information and should be deleted.

71. Section 2.8.3 second paragraph , first sentence is inappropriately worded in a negative manner that implies there is no control or management of potential impacts and should be revised; for example: "During the deforestation process, increased water erosion ~~will occur and~~ [**is controlled to minimize**] nutrients ~~could be~~ carried off site to adjacent streams.

72. Section 2.8.3 second paragraph, second sentence should be deleted. Again, the authors must focus the analysis to consider the environmental effects in a dispassionate manner. Can the report provided an example of deforestation for a house, agriculture, or campground where the statement is not applicable?

73. Section 2.8.3 third paragraph last two sentences should be deleted. The authors must focus the analysis to consider the environmental effects in a dispassionate manner. The statements are nontechnical, emotional, opinions and do not belong in the strategic analysis.

74. Section 2.8.3. Long-Term Effects, second paragraph should be deleted for obvious reasons; it is not applicable, not dispassionate and does not belong in the strategic analysis.

75. Section 2.8.4 Regulation, first paragraph, first sentence - really? The 300 or so federal and state regulations that apply to nonmetallic mining are secondary?

76. Section 2.9.3 Aquatic Invasive Species (AIS) second paragraph, first sentence should be deleted. If the author of this section has visited and studied ponds at multiple industrial sand mining operations, then some applicable facts should be provided. The report should provide an explanation as to how ponds at industrial sand operations are unique and why the statement is not somehow applicable to perhaps millions of ponds around the world.

77. Section 2.9.3. Aquatic Invasive Species (AIS) third paragraph should be deleted as it is generally inapplicable to mining and or is applicable to every other pond around the world.

Section 3 Socioeconomic topics

78. Section 2 Socioeconomic topics, first paragraph should clarify that impacts may be positive or negative. It is reasonable to expect that the majority of readers interpret the word "impact" with a negative connotation.

79. Section 2 Socioeconomic topics, second paragraph, second sentence is wholly inappropriate and should be deleted or at least rewritten to use available scientific information and consider the alternatives and environmental effects in a dispassionate manner and not advocate a particular position.

80. Section 3.1.2 Regional Physical and Recreational Characteristics, second and third paragraphs. These paragraphs may be informative and useful for a Wisconsin tourism brochure, but are not applicable or relevant to the strategic analysis.

81. Section 3.1.6. Public Recreation Lands Next to Sand Mines, first paragraph, first sentence is completely false, is anecdotal, not fact-based and should be deleted.

82. Section 3.1.6. first paragraph is anecdotal and should be deleted. There is no discussion of negative impact and there is no documented actual or potential impact. The presence of a mine does not translate to negative impact. The strategic analysis should use available scientific information and consider the alternatives and environmental effects in a dispassionate manner and not advocate a particular position.

83. Section 3.1.6. second paragraph, last sentence "In addition, a continuing low level **threat** also continues with railbanked trails being reestablished as rail service for commodity shipments." [**emphasis** added] indicates that the WDNR feels threatened which is an opinion that should be deleted. The strategic analysis should use available scientific information and consider the alternatives and environmental effects in a dispassionate manner and not advocate a particular position.

84. Section 3.2.1 Effects on Local Road Systems, first paragraph. Based on the second sentence "These issues are outside the authority of the DNR, and are regulated by local units of government, and Wisconsin Department of Transportation (WisDOT).", the remaining portion of the first paragraph should be deleted.

85. Section 3.3 Agricultural Lands, first paragraph, must refocus on the available scientific information and consider the effects in a dispassionate manner and would be very useful to be realistic. It is inappropriate to characterize that, in general, the 5.8 million people in Wisconsin are concerned about the impacts of industrial sand mining on agriculture or that reclaimed lands are suitable for crop production. It is accurate to say that vocal activists may express these concerns, but not appropriate for the WDNR to make these statements.

86. Section 3.4.1 Jobs, fourth paragraph bottom of page 3-100 is not applicable and inappropriate and should be deleted. Comparisons of industrial sand mining to metal mining as Powers did borders on intellectual dishonesty. If the WDNR authors studied the Powers report and not just cite it, and understand industrial sand mining operations, this paragraph would not be included in the strategic analysis.

87. Section 3.4.1 Jobs, fourth paragraph bottom of page 3-100 reference to the "Heartland Institute - Economic Impacts of Industrial Silica Sand (Frac Sand) Mining by Isaac Orr and Mark Krumenacher No 138 June 2015)" should be deleted as referenced. That particular report represents substantial technically vetted and appropriately cited research and absolutely does not "compare metal mining and agriculture to ISM and consider it an indicator of economic vitality for wages and employment". It is insulting and disappointing that the depth and quality of research and technically fact-based analysis that went into that paper was incorrectly summarized to that citation in the strategic analysis. Such reporting calls into question the validity of every reference in the Draft Report and

underlies the need for a professional editorial review that not only properly refocuses the tone and language of the various authors to be consistent with the intent of a Strategic Analysis but provides proper vetting of the document and cited references.

88. Section 3.5 Property Values, first paragraph, first sentence is false and must be deleted. There are not "Many reports on the impact industrial sand mines have on property values is varied and based on location." either positive or negative. If there are "many reports" that are technically valid and not just opinion pieces, the WDNR would be able to reference them.

89. Section 3.5 Property Values, second paragraph, second and fourth sentences should provide technically vetted citations to back up the statements, or be deleted. These statements are opinions, are not technical facts and are inappropriate. I have researched this issue, reviewed every available technical paper on the topic and wrote extensively on the issue in the Policy Paper No. 140, February 2016, Social Impacts of Industrial Silica Sand (Frac Sand) Mining: Land Use and Value, Mark Krumenacher and Isaac Orr. The strategic analysis should use available scientific information and consider the alternatives and environmental effects in a dispassionate manner and not advocate a particular position.

90. Section 3.7 Tourism, second paragraph, second sentence in inappropriate and should be deleted. It is astonishing that a technical review of the Economic Impacts of Industrial Silica Sand (Frac Sand) Mining paper would result in the conclusion presented in the second sentence. Even a cursory review of that paper should not draw that conclusion. The strategic analysis should use available scientific information and consider the alternatives and environmental effects in a dispassionate manner and not advocate a particular position.

91. Section 3.8.1 Air, first paragraph, first sentence should be modified to reflect reality. The strategic analysis should actually reference discussions with "those living near industrial sand mines" and not rely on anecdotal opinions. The strategic analysis should provide a fair and honest technical analysis of this issue and not simply repeat what the author "feels" is true. What does the word "those" really imply in the statement?

92. Section 3.8.2, first paragraph should be reworded to be technically appropriate. What does the word "those" really imply in the statement? Did the public really "present" these concerns?

I appreciate the opportunity to submit these comments. Please feel free to contact me at (262) 754-2565 or mark.krumenacher@gza.com with any questions.

Very truly yours,

GZA GeoEnvironmental, Inc.

Mark J. Krumenacher, PG
Senior Vice President/Senior Principal

Willger, Christopher J - DNR

From: [redacted]
Sent: Sunday, August 14, 2016 11:10 AM
To: DNRISMA@wisconsin.gov
Subject: Air Quality Studies

As a Chippewa County resident, I want to relay my concern regarding the fact that the frac sand air quality studies are only voluntary industry research. It is obvious that such research results would be tainted by the industry's desire to protect its own interest while possibly putting the public's health at risk. Who ever thought that this type of monitoring would be in the public's best interest?

Please do not allow this bias research to be the only resource for determining if our air is safe to breathe! The public needs to be able to trust that you will make sure Wisconsin is a healthy place to live!

[redacted]
Chippewa Falls, WI

FairmountSantrol

August 22, 2016

Roberta Walls [Roberta.Walls@Wisconsin.gov]
Industrial Sand Sector Specialist
Wisconsin Department of Natural Resources
3550 Mormon Coulee Rd
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ISM SA Coordinator [DNRISMSA@wisconsin.gov]
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Re: Comments on the June 2016 Draft Strategic Analysis of Industrial Sand Mining

Dear Ms. Walls and ISM SA Coordinator:

Associates from Wisconsin Industrial Sand Company (WISC) and Fairmount Santrol (FMSA) have completed a review the June 2016 Draft Strategic Analysis of Industrial Sand Mining Report (Draft Report) produced by the Wisconsin Department of Natural Resources (WDNR).
Within the balance of this correspondence, WISC and FMSA respectfully submits comments to the WDNR Draft Report.

General Comments
The document must receive additional evaluation and comment from a series of technical reviewers focused on refining every section to be stronger within the realm of a scientifically and technically defensible publication. Too few statements and conclusions elude to facts that are not referenced, and therefore, not substantiated. Thus, the Draft Report has sections with a feeling of hearsay and conjecture which is inappropriate for a technical document. Additionally, exhaustive references to other publications, scientific reports and technical documents, developed by WDNR and others, would help substantiate this work product and allow it to be appropriately finalized.

Executive Summary

Page ii
The initial paragraph(s) should include a brief description that Industrial Sand mining (ISM) is part of a larger non-metallic mining group. WDNR must clarify reasoning why ISM is being scrutinized separate from other non-metallic mining cohorts (such as Dimension Stone, Crushed and Broken Stone, Construction and Sand Gravel….) that must have similar stakeholder concerns.

The statement relating the number of industrial sand facilities (128 current with 92 are active) must include the date this statistic was determined.

Additional information is needed related to the acreages of ISM sites as well as a comparison to other non-metallic mining sites. This type of updated information would educate stakeholders to the totality of IS sites compared to cohort type sites in Wisconsin.

Page ii and iii
Consider revising air quality section to clearly indicate what air pollutants and size fraction, when applicable, are regulated.

Page iii
Clarification and technical justification must be added to the groundwater section to indicate why WDNR is convening a team of stakeholders to research groundwater at ISM sites while not looking into other types of non-metallic mining sites in the state.

Additional information within the wetland section is needed to both clarify regulatory programs (WDNR and Department of the Army, Corps of Engineers) as well as include the total area of all wetland impacts in Wisconsin since 2008. This additional information will assist stakeholders in understanding of this complex permit program.

Page iv
Consider revising the statement within the Local and State Economy section that "There is currently no reliable method to measure the secondary impacts for jobs surrounding the recent growth of the industry". An interview of qualified economist would likely result in a revised statement indicating that there are a variety of "models" to evaluate secondary job impacts from growth of an industry. Then WDNR could consider providing the results of various models related to this industry.

Under the Safety section, please verify that DSPS has jurisdiction over fuel storage tanks.

Section 1

Page 1-1
The last paragraph of this page implies products from ISMs in Wisconsin is only used in the fracking industry, when it has many other end users.

Page 1-2
A detailed description of other IS uses (metals casting, filtration, glassmaking…) is needed to further educate stakeholders.
Starting on this page, fracking is spelled different ways (fracking or fracing). Need to be consistent throughout the document to avoid confusion.

Page 1-3
Section 1.2.3, it reads "frac sand specifications is found in the Cambrian, Jordan, Wonewoc, and Mt. Simon Formations." It should read, "frac sand specifications is found in the Cambrian**-age**, Jordan, Womewoc, and Mt. Simon Formations."

Page 1-11
Under Pumps and Washing Section, it reads, "To the extent possible, water will be conserved and recycled by means of a settling pond." Not every facility has settling ponds. Many utilize clarifiers as a means of recycling water and the text must be revised to reflect this.

The Stockpiling Section there has an indication that "Sstockpiles containing fine-grained waste materials are prone to instability and runoff problems." This statement must be substantiated as well as clarified what is intended by use of the term "waste".

Page 1-12
Use of the term underwater under Section 1.3.2 is confusing. Thus please clarify this section to indicate that some mined materials are found within, and mined from, the local water table.

Page 1-17
Under Rail Systems, it reads, "Most of the rail cars being uses are open-topped…" In fact, most rail cars being used are covered hopper cars. The car's top hatches are closed during transportation so that sand is retained in the car during travel.

Environmental Topics

Page 2-21
Additional information related to mobile vs. fixed sources of diesel particulate emissions must be discussed to clarify emissions from these two different type of sources are regulated.

Page 2-23
There is an indication under the Silica Content of Particulate Matter Section that, "Crystalline silica is a component of particulate matter." Crystalline silica can be a component of particulate matter, but is not a component of all particulate (i.e. such as particulates from combustion sources, pollen…) matter. This should be clarified.

Pages 2-24 to 2-26
Please clarify the regulatory position for particulate material emitted from transfer points such as conveyors, elevators, loading spouts and chutes. Clarification is needed for stakeholders to understand if the use of this type of equipment results in point source or fugitive emissions.

Pages 2-27 to 2-28
The New Source Performance Standards section needs to include the potential use of wet scrubbers as emission controls for such processes as drying, screening, and use of storage bins.

Page 2-28
Please modify text at bottom of page to indicate that mining operations may include the utilization of electrical generators. Additionally, please update text to identify the size of stationary engines that are subject to NSPS and NESHAP requirements.

Page 2-34
Again, clarification is required to allow stakeholders to understand why WDNR is not looking into the remaining non-metallic mining industry for issues related to physical and chemical between generated waste and surface/groundwater resources.

Page 2-41
Section 2.3.7 appears to target the ISM industry with burdensome requirements that are not being required of the remaining non-metallic mining industry in Wisconsin. This initiative is poorly substantiated if the WDNR will not also evaluate the same potential situation at other non-metallic mining facilities.

Page 2-48
The Current Trends Section 2.3.17 should also provide context regarding water withdrawal amounts state-wide and show a percentage of withdrawals industrial sand facilities compared to the total. This information was presented in the Institute for Wisconsin's Health, Inc. Health Impact Assessment on Industrial Sand Mining in Western Wisconsin.

Pages 2-48 to 2-49
Much of the text appears to be speculative and draws an uninformed reader to the conclusion that industrial sand mining will result in appreciable cumulative impacts. If impacts such as those outlined in this text is evident from existing ISM facilities, then make an appropriate reference. If not, then strike this text.

Page 2-53
A reference to a pending study that the DNR is to begin in the summer of 2016 to research possible linkages to increased concentrations of dissolved metals in groundwater and sand sites. A statement is then made "Metals may originate in the cementing materials in the sandstone formations and may be liberated during processing. Process water holding ponds are of particular concern, as metals may be concentrated there in both solid and dissolved forms." These statements are unwarranted if the WDNR is not also looking into this issue with the rest of the non-metallic mining industry in Wisconsin.

Page 2-66
Section 2.6.1 indicates that most of the ISM industry is concentrated in the"Driftless area of the state". The WDNR should consider inserting a map into this section to assist the reviewer understanding where the "Driftless area" is located as well as a definition of the "Driftless area" in this section.

Page 2-68
The text indicates that "The long term impacts of ISM in close proximity to trout waters are unknown. Fisheries biologists who manage counties near mines have received various complaints about stream deposition, high turbidity and run-off events. The effects of these events are not always clear." This text may lead a reviewer to conclude a correlation between ISM and these impact. The text should be clarified.

Additionally, the text describes an event that happened at a site in September 2014. It states that "No impact was documented to the fish community at that time, though it is still possible that there will be long-term impacts." The text should be modified to list out viable long-term impacts. If viable long term impacts are not evident, then the text should state such.

Page 2-80

Under Short-Term Impacts, it reads, "ISM will have a pronounced impact on the visual aesthetics where they are established." We question the source for this information and the relevance of a subjective non-environmental impact being in this report. This and other subjective text, such as, "Visual quality and aesthetics of forested areas are the primary reasons people choose to recreate and live in these areas. They are attracted by the peace and quiet of the outdoors and forests create this level of quality for our lives." should be stricken from this report.

The last sentence in the Long-Term Effects section says that sand mining will take forest out of production, resulting in a reduction of long-term benefits that could be derived from forest resources as a commodity is an incomplete analysis. The WDNR should also indicate that the area will experience increased economic benefit from the presence of an industrial sand mining operation.

Additionally, the second sentence under the Regulation section says "… and no mining would not be allowed". Should either be "no mining would be allowed" or "mining would not be allowed".

Page 2-87

Consider using a different term than "contemporaneously" in this section. It may be easier for some reviewers to know that reclamation can occur "during the same period of time" rather than "contemporaneously".

Socioeconomic Topics

Page 3-88

With respect to Socioeconomic topics, would appear that the DNR lacks the technical aptitude to speak of such subjective and potentially emotional matters. Much of the information in the Socioeconomic section is not referenced. Perhaps it would be more efficient, for the WDNR to provide summaries of socioeconomic reports completed by others and attached those reports as addendums to the Strategic Analysis.

Page 3-91

The last sentence under section 3.1.6 it states "..a continuing low level threat also continues with railbanked trails being reestablished as rail service for the commodity shipments." It would appear that the term "threat" is incorrectly used because rail development is part of economic development with a positive effect.

Page 3-92

The beginning of section 3.2.1 states "These issues are outside the authority of the DNR, and are regulated by local units of government, and Wisconsin Department of Transportation." Thus, the

WDNR should not comment topics outside defined regulatory authority or subject matter expertise.

Page 3-96
The text under the Delays to Emergency Vehicles section indicates that "Drivers are experiencing more frequent and longer delays at at-grade rail crossings." This statement must be substantiated or stricken.

Page 3-99
Section 3.3.1 of Transportation Logistics mentions shipping sand in unit trains as potentially negative. The sand industry is moving in the direction of utilizing more unit trains to ship products long distances. The move to unit trains has benefits such as streamlining the shipping process, reduced rail traffic congestion. This could potentially reduce the pressure on the railroads to service other industries.

Page 3-101
The end of section 3.4.2 indicates a source sited as "(personal conversation, Keith Foye, DATCP)". A follow-up written correspondence should occur so that a written record can be referenced and available for the document.

Page 3-103
The end of section 3.5 source is sited as "pers.comm." Thus the same concern as with the reference noted on Page 3-101.

Page 3-107
Section 3.9.1 indicates "Regulation of impacts due to light from nighttime operations is not under the DNR jurisdiction." Thus, reporting should not be done on items not regulated or under the expertise of the WDNR.

Page 3-108
Similar comment related to WDNR reporting on non-jurisdictional items found within section 3.9.2: "Regulation of impacts due to noise of operations is not under the DNR jurisdiction."

Regulatory Framework

Page 4-114
Section 4.1.9 states "There are other means a local unit of government may use to exert some conditions on an industrial sand mine, including…" This WDNR statement is dangerous because it implies that local units of government NEED to exert additional conditions on ISMs. Current regulations at the state and federal level already heavily regulate ISMs.

Pages 4-123 and 4-125
A summary of regulatory programs in other states (such as Minnesota Policy) is unneeded and unwarranted. If WDNR insist on this section, then summaries of the regulatory programs in other neighboring states (Iowa, Illinois and Michigan) must also be provided. This is an issue again on page 5-125 under section 5.1 which states "Wisconsin could consider regulatory changes such as

those in Minnesota." Wisconsin may want to consider regulatory changes to mimic those found in Illinois, Iowa or Michigan.

Alternatives and Non Regulatory Activities

Page 5-126
Please revise the paragraph earmarked for Fairmount Santrol as follows:
Fairmount Santrol's diverse mining plans include a surface mine and the operation of Wisconsin's only two underground mines. In addition to their commitment to the Wildlife Habitat Council programs and the standards set by the Saving Birds Thru Habitat organization, the underground mines also provide habitat for the four species of cave-dwelling bats found in Wisconsin. Fairmount has partnered with the DNR and other stakeholders (such as the United States Fish and Wildlife Service). to foster research and monitoring of the bats frequenting portions of the underground mines. The research work includes population dynamics and surveys to evaluate bats for the presence of "White Nose Syndrome." White Nose Syndrome is a fungal disease that threatens bat populations across the U.S. Fairmount Santrol has also been recognized as a Green Master through the Wisconsin Sustainable Business Council's program. They are engaged in habitat and stream restoration, and many community projects at their locations in Wisconsin.

I would like to thank you in advance for serious consideration of these comments and look forward to their incorporation into the Draft Report as it becomes finalized.

Should you have questions or require clarification on the comments and information provided above, please contact the undersigned at mike.melton@fairmountsantrol.com or 815-830-2920.

Respectfully,

Michael Melton

Michael Melton
Director of Environmental Services
Fairmount Santrol
P.O. Box 119
Wedron, IL 60557

Willger, Christopher J - DNR

From: [redacted]
Sent: Friday, August 19, 2016 11:13 PM
To: DNR ISMSA
Subject: Comment on Draft Strategic Analysis re: Frac Sand Mining

The Sierra Club says the following and I totally agree:

"*Upon initial review, the draft Industrial Sand Mining Strategic Analysis is disappointing. It makes far too many assumptions instead of getting solid information. We need a deeper analysis, more data and more input from experts and the public in order to truly understand the impact of frac sand mining on public health and the environment. For example, the air quality section has the same flaw as the DNR's other recent work dealing with fine particulate matter (PM2.5) in that it asserts that industrial sand mines do not produce or emit PM2.5 but the agency does not have evidence to support this conclusion. This kind of leap of faith is riddled through most sections of the analysis."*

.The analysis needs more impartial scientific information.

Thank you.

[redacted]
Private Citizen,
Elmwood

Comments on the Wisconsin DNR 2016 Strategic Analysis of Industrial Sand Mining.
8/20/2016
submitted by [redacted]

I'd like to begin by quoting from the Wisconsin DNR website, accessed 8/20/2016
http://dnr.wi.gov/topic/EIA/ISMSA.html
which states: "A strategic analysis evaluates factual information to inform policies and approaches for contentious resource issues." The draft section on air quality is written as though there were no contentious resource issues. It is composed mainly of assertions without information or evidence. In support of this I submit the following.

The executive summary of the 2016 WDNR Strategic Analysis begins with:

"A Strategic Analysis examines a broad environmental issue or topic rather than a specific project. The purposes of this document are to provide up-to-date information about industrial sand mining (ISM) in Wisconsin, update the department's 2012 summary paper on the subject, and address environmental topics that the public expressed interest in during the public scoping process. The report provides factual information about the industry and typical operations, as well as about air quality, water quality, wetlands, groundwater, wildlife, endangered resources, and socio-economics."

So one should expect up to date information on ISMs in general and also topics of public interest.

There is considerable public interest in air quality and I want to comment on the section on air quality.

The summary goes on to state:
"Particulate matter less than 2.5 microns ($PM_{2.5}$) is a particulate size derived from combustion activities or chemical reactions between precursor pollutants like nitrates and sulfates, and not from processing or mining of sand. Air quality monitors in western Wisconsin have not detected elevated levels of $PM_{2.5}$. Particulate emissions are addressed by health-based regulations, and existing monitoring data have not identified problematic air quality at sand mining and sand processing sites."

The first sentence seems to conclusively state that PM2.5 particulate will not result from "processing or mining of sand". That is a pretty strong statement and it could be said it is somewhat misleading since the "processing and mining of sand" involves diesel equipment which does produce PM2.5 particulate. To inform that "air quality monitors in western Wisconsin have not detected elevated levels of

PM2.5" is factually correct but informationally empty since the public interest was not in air quality in EauClaire or LaCrosse but in areas near to the mining operations. These monitors would be relevant only if it was the case that the DNR was maintaining that any air quality problem around a sand mine would noticeably effect a monitor in EauClaire or LaCrosse. If this is the view of the Wisconsin DNR it ought to be stated explicitly and informatively defended. It is not stated explicitly nor is it defended.

But these are statements from an executive summary. The relevant portions of the analysis should provide argument and analysis to back them up plus addressing other public concerns. Does it? I would suggest the answer is "no".

One common public concern is the hazardous pollutant crystalline silica. Early in section 2.1 the DNR states:

"…crystalline silica is a component of particulate matter, so existing particulate matter regulations also control emissions of crystalline silica."

Here, again, is a statement that is factually correct but relevant informationally empty. If one considered the regulation controlling PM10 this says that one could be confident that crystalline silica concentrations were less than 150µg/m^3 on average over a 24 hour period or if one considered the PM2.5 regulation, which the DNR does not monitor at ISMs, one could be confident that the crystalline silica concentrations were below 35µg/m^3 on average over a 24 hour period. These assurance levels are quite a bit larger than the health based recommendation of some state entities of 3µg/m^3 and provide no confidence about the levels of crystalline silica for the public.

The discussion about the appropriateness of only PM10 monitoring occurs on pages 2-22 and 2-23. It is important to note that the DNR statements have no references. There is no evidence presented. The statements are assertions. The only thing that resembles an argument is:

"c) the physical shape of the particles in the sand formations are rounded, and breaking these particles into smaller sizes during sand mining and processing operations would result in particles that would not be suitable for use as proppants in oil and gas extraction wells. The PM_{10} and smaller sized particles are not desirable in the products used for oil and gas well extraction."

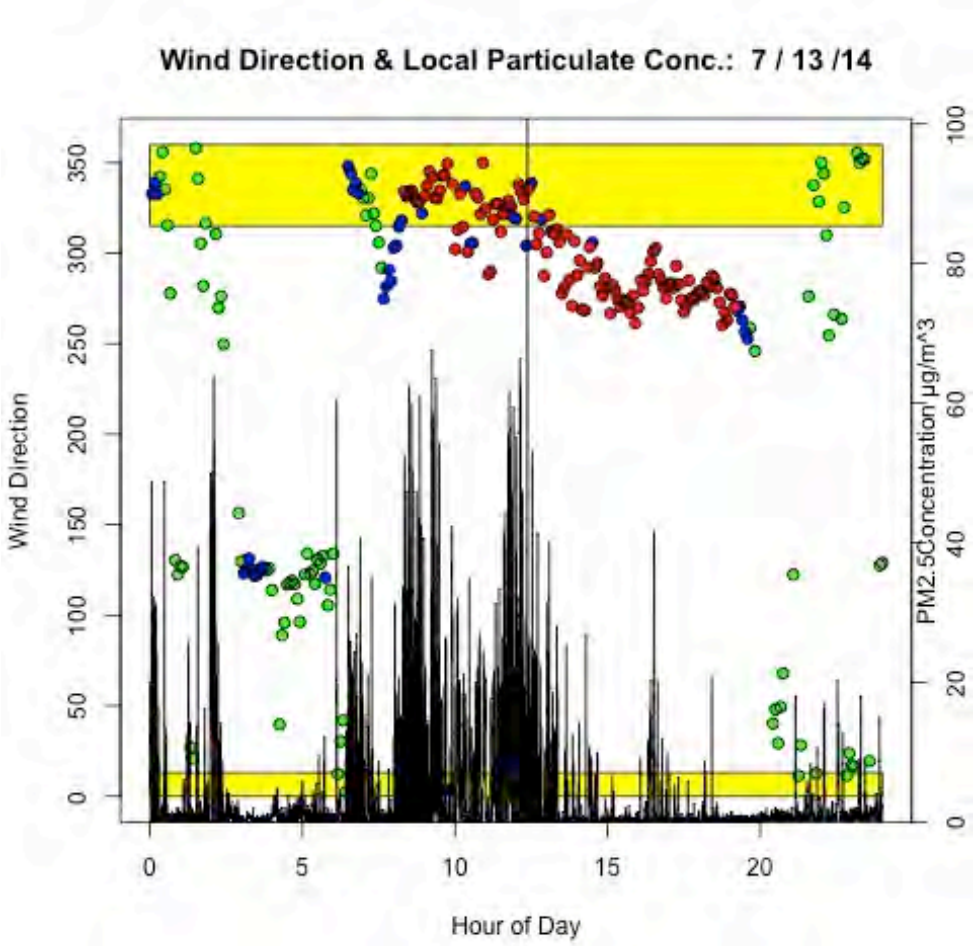
In other words, the argument it seems is:

the smaller particles are "not desirable"
what is not desirable will not be produced
therefore there will be no or minimal smaller particles

There is no evidence or reference shown for “what is not desirable will not be produced”.

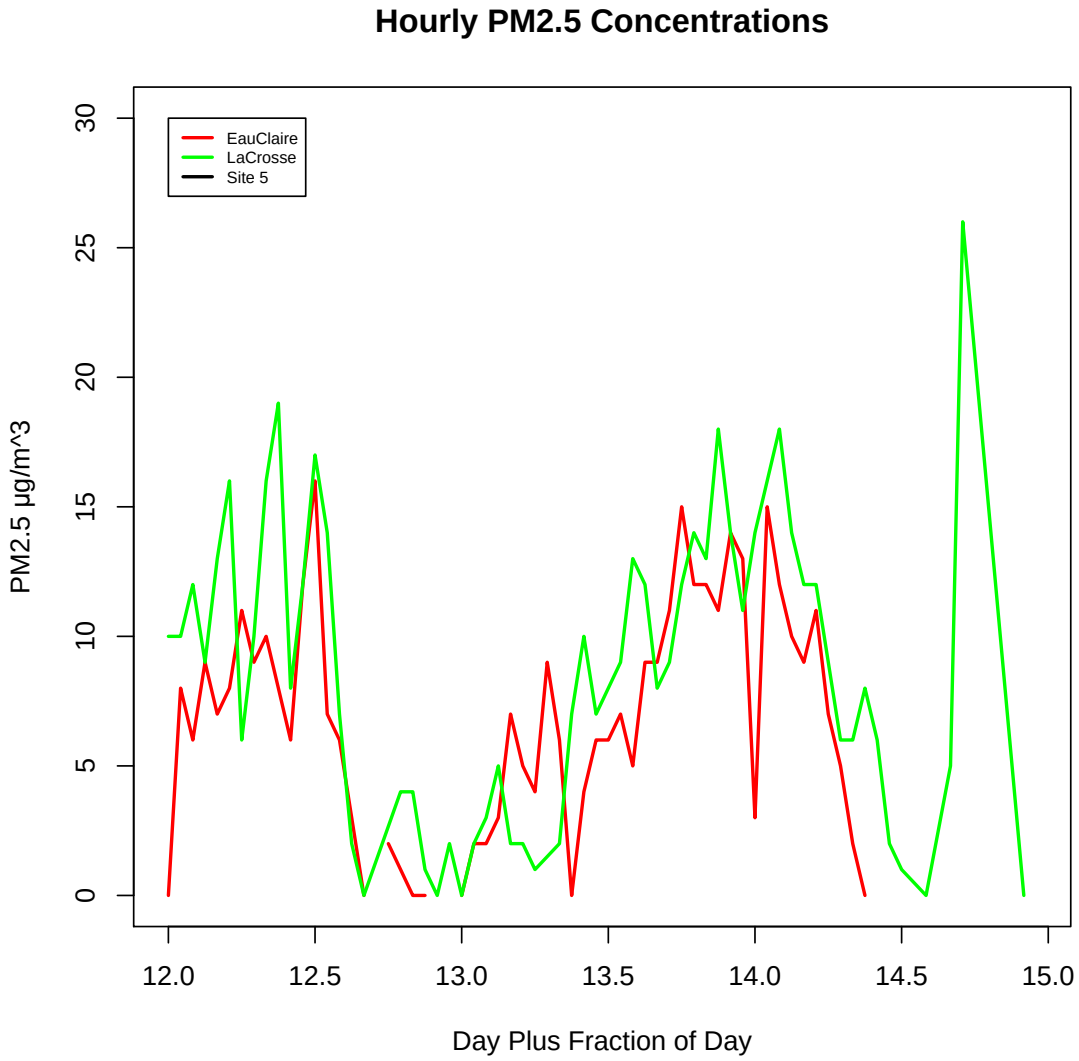
In fact, the University of Iowa presentation in Whitehall presented evidence of locally produced PM2.5 at very high concentrations at one of their monitored sites when the wind was coming from an area of a facility used for transloading. No standard was even close to being exceeded but that is not the question. The question is about evidence for production of smaller particles at mining facilities. The site, called “site 5”, was within a mile of the Preferred Sands facility near Blair, Wisconsin.

The following graph is from the University of Iowa’s groups’ Whitehall presentation. I wrote the code to produce the graph. The horizontal axis is the hour of the day, 7/13/14. The left hand vertical axis shows the wind direction in degrees. The yellow bands encompass the wind directions coming from the facility to the monitor. The vertical right hand axis is the estimated locally produced PM2.5 concentration monitored every 20 seconds.

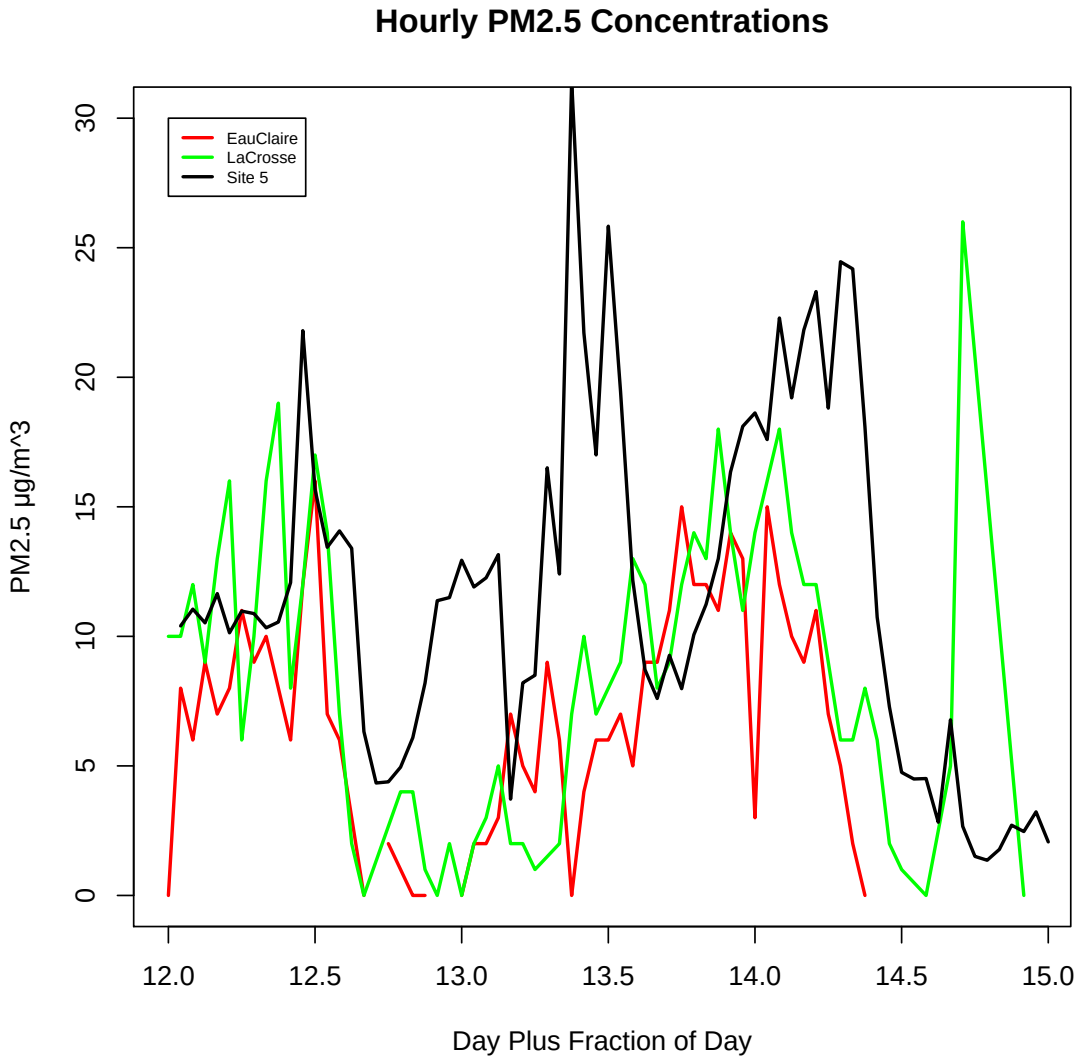


The red, blue, and green circles are five minute vectorized averages of wind speed. The hours from about 7AM through about 1PM show high PM2.5 concentrations associated with wind from the northwest area of the facility which is where the transload section is located relative to the monitor. I do not claim this is evidence of a regulation violation. I will maintain it is circumstantial evidence of a link between PM2.5 concentrations and ISM facility operations and therefore the cavalier dismissal by the DNR of PM2.5 monitoring is suspect.

The next graph shows the hourly PM2.5 DNR monitored readings at EauClaire and LaCrosse for July 12th, 13th, and 14th , 2014.



There are a number of hours with missing data. But by and large the monitoring results in EauClaire and LaCrosse are tracking well. This implies both monitors are basically recording regional concentrations and locally produced PM2.5 particulate is not of such high concentration to have a noticeable effect. The next graph adds the hourly average monitored readings for the University of Iowa's site 5.



The differences are striking. The differences are especially large for July 13th during the times noted previously.

I want to stress this is not submitted as evidence of a regulation violation. It is submitted as evidence that the Wisconsin DNR's unsupported statements about the non production of small particulate by ISMs is certainly questionable. The DNR had a representative at the Whitehall presentation and could have asked for more detail about the monitoring efforts but preferred to pay it scarcely a mention on page 2-34. It appears the DNR prefers assertions to evidence on this "contentious" issue.

August 21, 2016

Wisconsin DNR ISM SA Coordinator
OB/7P.O. Box 7921,
Madison, WI 53707-7921

Re: Comments on Draft Industrial Sand Mining Strategic Analysis

Dear ISM Strategic Analysis Coordinator and Board Member:

Thank you for the efforts in preparing this the draft Strategic Analysis. I have a number of very important concerns to Wisconsin communities and residents that I feel were not adequately addressed or answered as part of the study:

- The report does not adequately address the risks to mine employees and nearby residents from fine particular matter (PM2.5) and the U.S. EPA's objections regarding how the State of Wisconsin addresses PM2.5. Instead, the Strategic Analysis references the biased and incomplete 2016 Health Impact Assessment (HIA) from the Institute for Wisconsin's Health, which relied heavily on industry-sponsored data and studies and reached no concrete conclusions on fine particulate matter (PM2.5) emissions. As I understand it, there has been very little data collected for respirable crystalline silica or fine particulate matter (PM2.5) near industrial sand mining operations. Additionally, only about 10% of industrial sand mining operations in Wisconsin are required to monitor for the larger PM10, and even the reliability of this data has been questioned by experts due to factors such as poor location of ambient air monitors.
- While the report recognized water quality risks and DNR sampling suggests that acid mine drainage at some mine sites may be occurring, the Strategic Analysis does not offer a clear strategy on further study and actions on how heavy metal discharges to surface and groundwater will be addressed, including recommendations on stormwater and wastewater monitoring.
- The quality-of-life impacts to neighbors surrounding mining-related facilities are under-estimated and are not fully considered in the Strategic Analysis as well as the Health Impact Assessment upon which the S.A. relies. Wisconsin residents living near these sites should not have to wipe the sand out of their bathtubs before taking a bath, and schools should not need to install special air filtration systems due to windborne particulate matter. This is allowing a heavy industry in a rural area that changes the character of the small communities with additional traffic, noise, light pollution, etc. Gallup polling has shown that the next generation is choosing where they want to live first based on quality of life, then finding a job. These operations have long-term community impacts. Our quality of life is why we choose to live where we do and why we love Wisconsin and our community. The Strategic Analysis spends less than one page discussing quality of life, and the report spends much more time discussing the property values of mining facilities, rather than the property value impacts to nearby commercial and residential properties. Just because these topics are more difficult to study and quantify, does not make them any less important.
- The Strategic Analysis fails to address what is really happening locally regarding permitting and reclamation planning and the related costs to local governments. Zoning and reclamation

planning requirements vary widely from county to county and, sometimes, are applied inconsistently from project to project within the same county. Much too often, the burden is being placed on elected officials and local/county staff to make siting, conditional use, and reclamation plan decisions without objective expert advice. And insufficient permit applications leave the general public without sufficient information to provide informed comment on proposals and plans. In most cases, reclamation planning requires no feasibility analysis based on science that demonstrates the physical feasibility of the planned re-use of a mining site once the large-scale destruction of the pre-existing land cover and geology has occurred; current reclamation planning approaches are often naïve and simplistic. And, perhaps most importantly, the Strategic Analysis fails to address the bonding loophole in State Statutes that could allow a mining company to walk away before reclamation is completed and may leave the State, County, and/or local community "on the hook" for millions of dollars to reclaim a mining site. There needs to be stronger guarantees that reclamation will occur as planned. The Strategic Analysis needs to take a harder look at the many weaknesses in current reclamation planning and related regulations.

I strongly believe that WDNR should take additional time to thoroughly address the above questions and provide additional opportunities for public input once the revisions are completed. Without addressing the above, the strategic analysis is incomplete and misleading to the public and elected officials.

Sincerely,

[redacted]
[redacted]
Fairchild, WI 54741

cc: Wisconsin Natural Resources Board
c/o Laurie J. Ross, Board Liaison
Office of the Secretary, Wisconsin DNR PO Box 7921 Madison WI 53707-7921

Willger, Christopher J - DNR

From: [redacted]
Sent: Tuesday, July 26, 2016 8:28 AM
To: DNR ISMSA
Subject: comments on the DNR strategic analysis of industrial sand mining and environmental/social consequences

I am not able to make the hearing today in Chippewa Falls. I am co-owner of a small business (café-coffee shop) in Reedsburg, WI. We work six days a week and it's almost impossible to get away. But I am very concerned about sand mining and it's effects on areas it is located. Personally, I am quite aware that our area will be in the sights for future sand mining operations as we live and work in the top western corner of Sauk co. which has a rich supply of this kind of sand. When the price of gas goes up, we will again be a potential area. This will be bad for our business as it is one block from the railroad track head where this would be hauled. The particulate sand has not been studied and what study there was by a UW-Stevens Point professor/scientist is apparently being ignored. Operations like this will affect our farm and business property values, tourism, runoff into streams, groundwater contamination, roads ruined by heavy trucking.... just in general a lose-lose situation for our small communities. Please do the real work and pay attention to the study and do more to insure that our communities are not offered up to these frac sand mining operations so easily and thus destroyed.
Sincerely,
[redacted]
farmer and business owner
[redacted]

[redacted]
Eleva, WI 54738
[redacted]

August 10, 2016

ISM SA Coordinator
WDNR OB/7
PO Box 7921
Madison, WI 53707-7921

Re: Industrial Sand Mining in Wisconsin
Strategic Analysis for Public Review, June 2016

Dear DNR Staff:

I am a resident of Trempealeau County who is writing to comment on the Department's draft industrial sand mining (ISM) strategic analysis. The residents of west central Wisconsin appreciate the Department's intention to examine the environmental and socio-economic issues associated with ISM so that this information can be used by the public and by policy makers. However, the report is of limited value as a resource for discussion and decisionmaking by local governments, because the Department has not conducted the independent research necessary to address many of the most controversial issues associated with ISM.

For instance, to my knowledge there has been little government or independent monitoring of PM 4 or PM 2.5 crystalline silica particulate matter near operating mines, even though PM 2.5 is the particle size most closely linked to lung disease.

To date there has been little investigation of the impact of mine site runoff on groundwater quality, even though the Department has acknowledged the need for research on the presence of metals and acrylamides in groundwater.

In 2013-2014 I was a member of the Trempealeau County committee that investigated the health impacts of industrial sand mining in the County. The committee was frustrated at that time by the fact that the Department had allocated minimal resources to ISM research and monitoring. Most of the data that we needed to identify health effects of ISM did not exist. Two years later, little has changed.

On air and water quality issues covered by the report, the Department concludes that there is little data, research or information available. This is primarily because in the eight years since the expansion of ISM in 2008, the Department, charged by the citizens of Wisconsin with protecting the environment, has done little to collect data or do research on the environmental and health effects of ISM. The citizens of Wisconsin will not have the scientific information necessary to make informed decisions on protecting air and water quality if the regulatory

agency charged with protecting air and water does not do the necessary research and testing to provide this information.

I urge the Department to do the research necessary to answer the public's questions about ISMs' potential effect on air and groundwater quality. Citizens are not in the position to do this research themselves; they have entrusted the Department with this critical task. If the Department does not have the funding or the personnel to do the necessary research, I urge the Department to request the necessary funding, personnel and equipment from the legislature.

Until it does this research, it will be unable to protect the citizens and the environment of central and western Wisconsin.

Sincerely,

[redacted]
Attorney and Trempealeau County Resident

Dear Wisconsin DNR,

Thank you for the opportunity to comment on the strategic analysis of industrial sand mining. Overall I thought the document was well done. I believe more pictures and graphics would be beneficial to make the document easier for the public to understand. I've broken my comments on the impacts into categories. Please see the comments below.

Air Quality

The air quality section needs more pictures. From my experience, I've found most people are visual learners. I attended the public meeting in Eau Claire on July 26th and found that most people do not understand why the DNR has incorporated data from the Richards et al, studies. They believe the industry data is necessarily biased. I think if they understood the data collection process in better detail it would help alleviate concerns.

I have attached the findings of an upcoming report I have written for the Heartland Institute on air quality to serve as an example of the kind of diagrams I believe would be beneficial for the reader. Please not this is a **draft** and it should not be cited or quoted, but please feel free to use it as a model.

Fenceline Monitoring at Shakopee Sands, Jordan, Minnesota

MCPA ambient air monitors were placed near the fence line of two sites at the Shakopee Sands facility in Jordan, Minnesota to measure RCS and PM10 beginning in the third quarter of 2012. RCS data were collected for more than one year, and PM10 monitoring continued for three years, ending in June 2015.[1]

Results of the monitoring at the facility show RCS concentrations below the Minnesota and California exposure level on every day sampled, and results show concentrations of RCS were so low, they were unable to be detected on 42 of 44 sample days, or 95.55 percent of the days sampled (See Figure xjordanrcs). Additionally, PM10 concentrations were far below the 150µg/m^3 standards established by EPA, and concentrations of PM10 were closely correlated to background PM10 concentrations in other areas, suggesting the Shakopee Sands facility was not a significant contributor to particle pollution (See Figure xjordanpm10).[2]

[1] Minnesota Pollution Control Agency, "Shakopee Sand (previously Great Plains Sand) Ambient Air Monitoring," State of Minnesota, October 2015, https://www.pca.state.mn.us/sites/default/files/g-70-03.pdf.

[2] Minnesota Pollution Control Agency, "Shakopee Sand (previously Great Plains Sand) Ambient Air Monitoring," State of Minnesota, October 2015, https://www.pca.state.mn.us/sites/default/files/g-70-03.pdf.

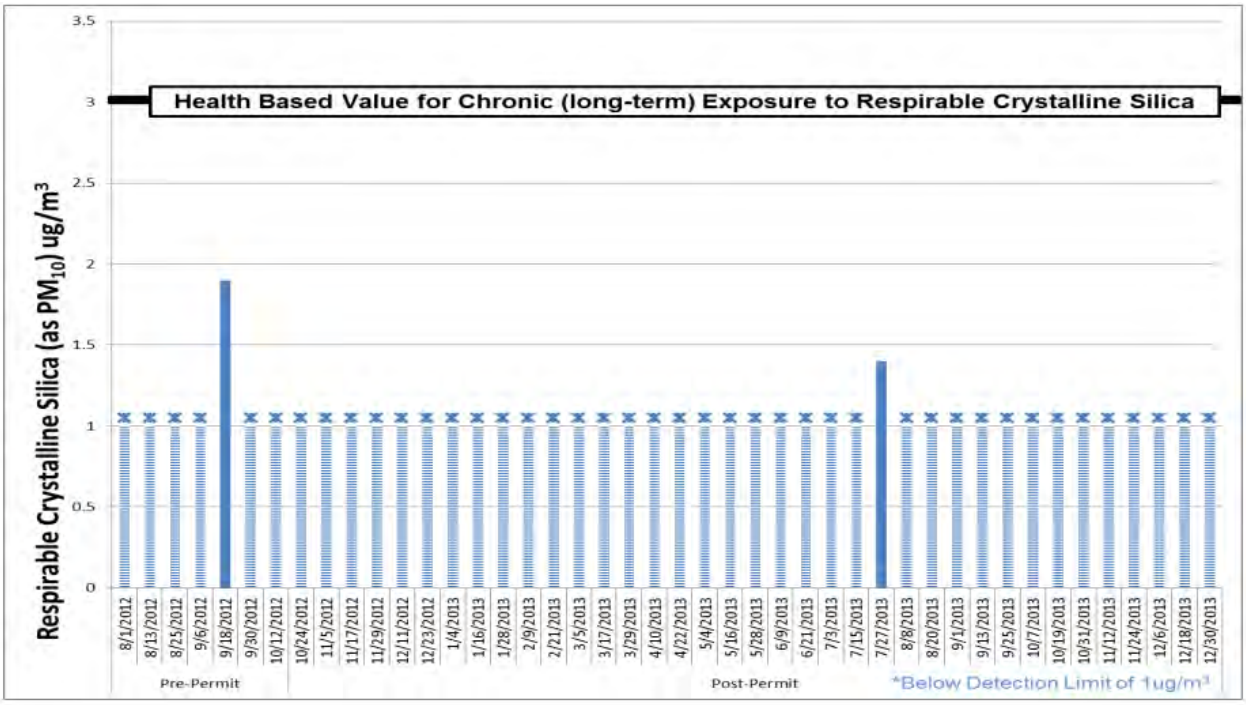
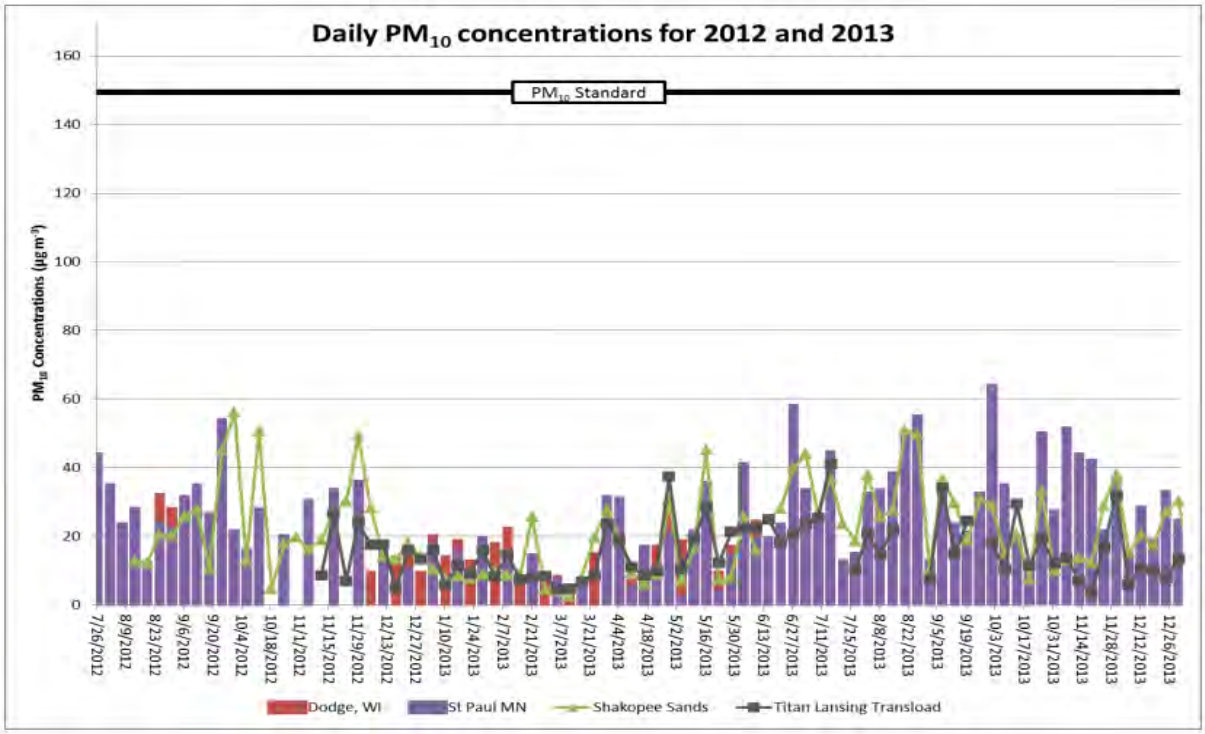


Figure xjordanrcs. Respirable crystalline silica (PM4) was monitored at the northeast side of the Shakopee Sands fence line at a 1 in 12 day frequency was completed showing only two days where silica was able to be detected at the facility. Levels of RCS were so low they were unable to be detected on 95.55 percent of the days sampled.[3]



[3] Minnesota Pollution Control Agency, "Shakopee Sand (previously Great Plains Sand) Ambient Air Monitoring," State of Minnesota, October 2015, https://www.pca.state.mn.us/sites/default/files/g-70-03.pdf.

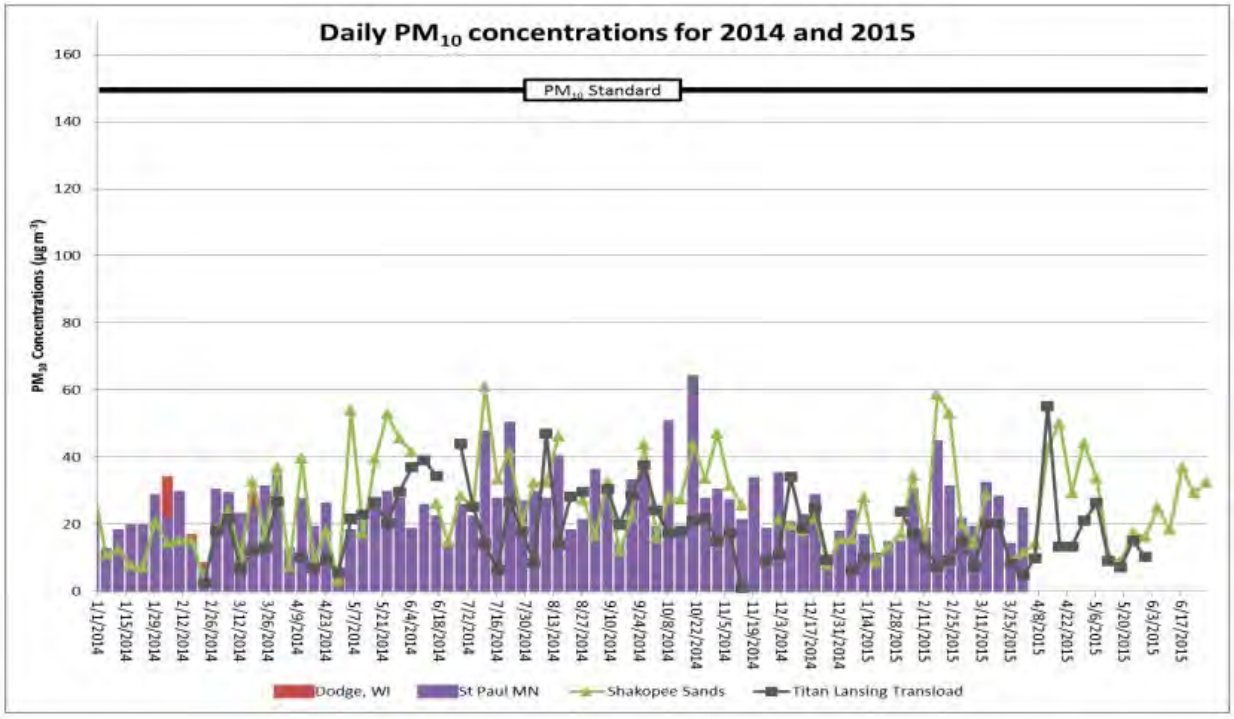


Figure xjordanpm10. Results for PM10 monitoring at Shakopee sands show maximum PM10 concentrations were less than one half of the 150µg/m^3 standard established by EPA, meaning this facility posed no threat to public health. PM10 concentrations closely mirrored PM10 concentrations in areas throughout Minnesota and Wisconsin.

Jordan Sands, LLC, Mankato, MN

MPCA conducted ambient air monitoring at Jordan Sands, LLC for particulate matter less than or equal to 10 microns (PM10), particulate matter less than or equal to 2.5 microns (PM2.5), and silica in particulate matter less than or equal to four microns (PM4 silica). Meteorological parameters were also collected.[4]

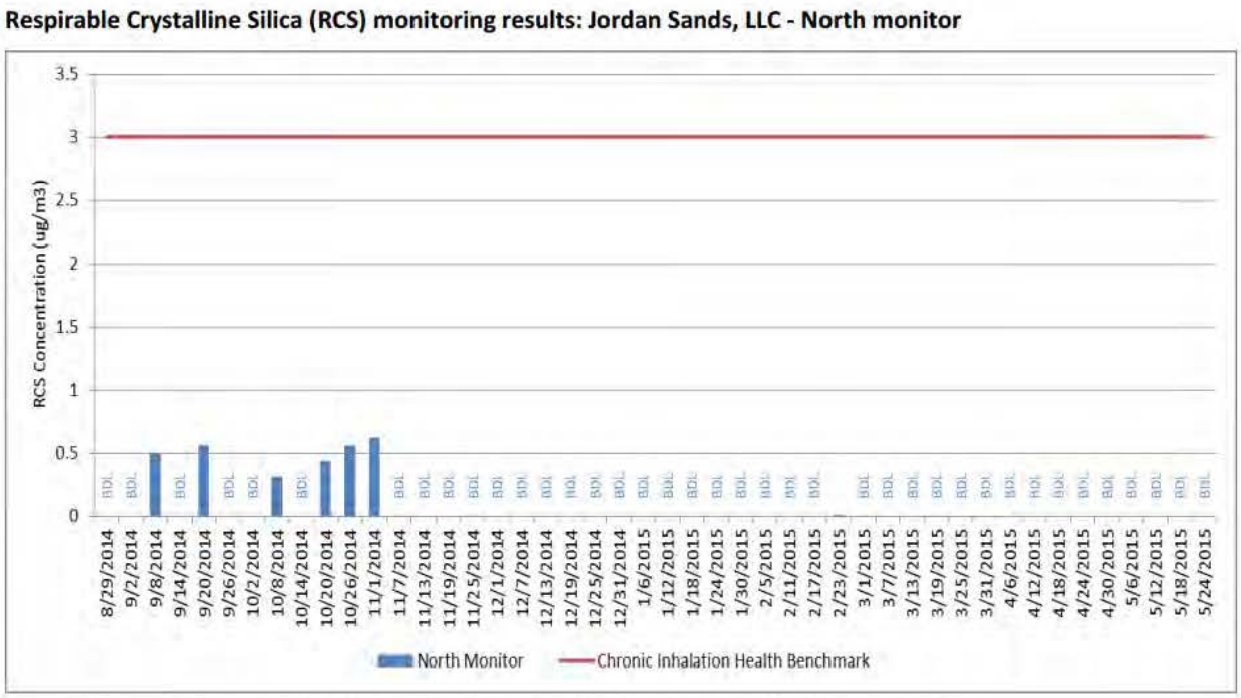
Two air monitors were used to give upwind/downwind readings. One ambient air monitoring station (South) was located on the south-southeastern side of the proposed dry plant facility and the large outdoor sand storage pile near the Jordan Sands property line. The second monitoring station (North) was located on the far northern side of the current mine site along the property boundary near the intersection of County Road 5 and Deerhaven Drive.[5]

Results from the monitors at Jordan Sands indicate levels of RCS far below the health-based limits, and concentrations were frequently so low the vast no RCS was able to be detected on the

[4] Minnesota Pollution Control Agency, "Jordan Sands Ambient Air Monitoring," State of Minnesota, October 2015, https://www.pca.state.mn.us/sites/default/files/g-7-01.pdf.

[5] Minnesota Pollution Control Agency, "Jordan Sands Ambient Air Monitoring," State of Minnesota, October 2015, https://www.pca.state.mn.us/sites/default/files/g-7-01.pdf.

majority of days (See figure xmakatorcs.). Additionally no exceedances of the PM2.5 standard were detected (See Figure xMankato2.5).



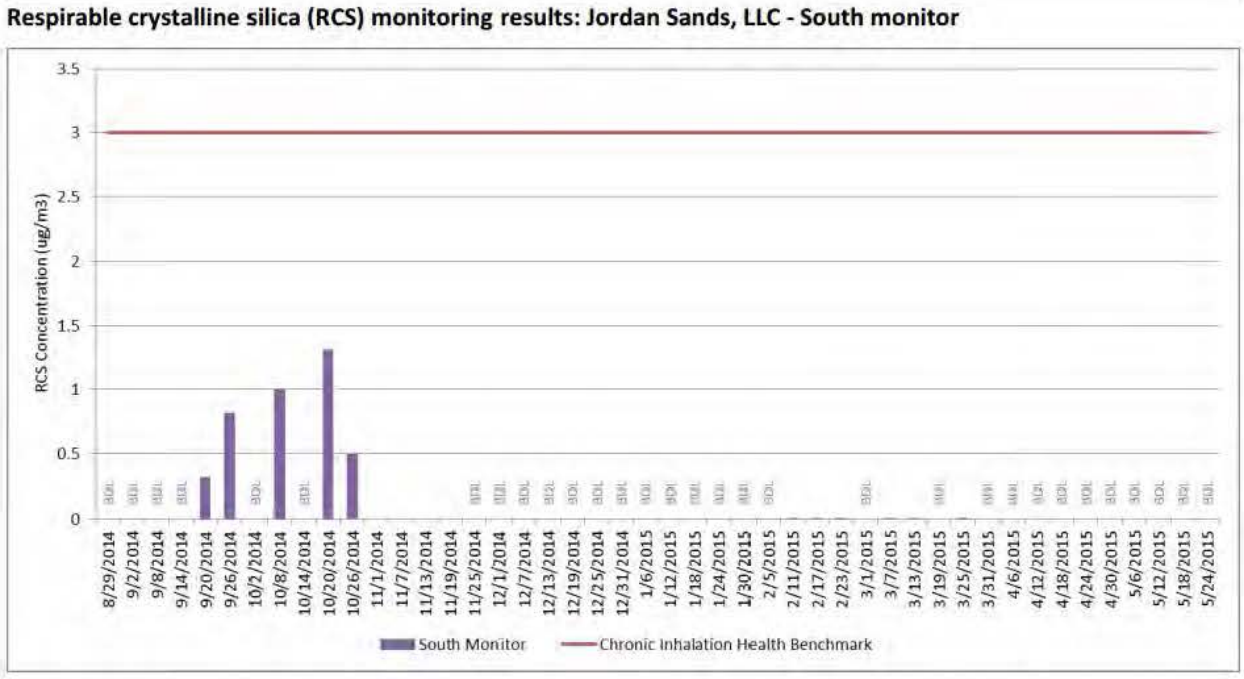


Figure xmankatorcs Concentrations of RCS at upwind and downwind facilities show every sample day was far below the health-based standard of 3µg/$m^{3.}$ BDL means below detection limit.

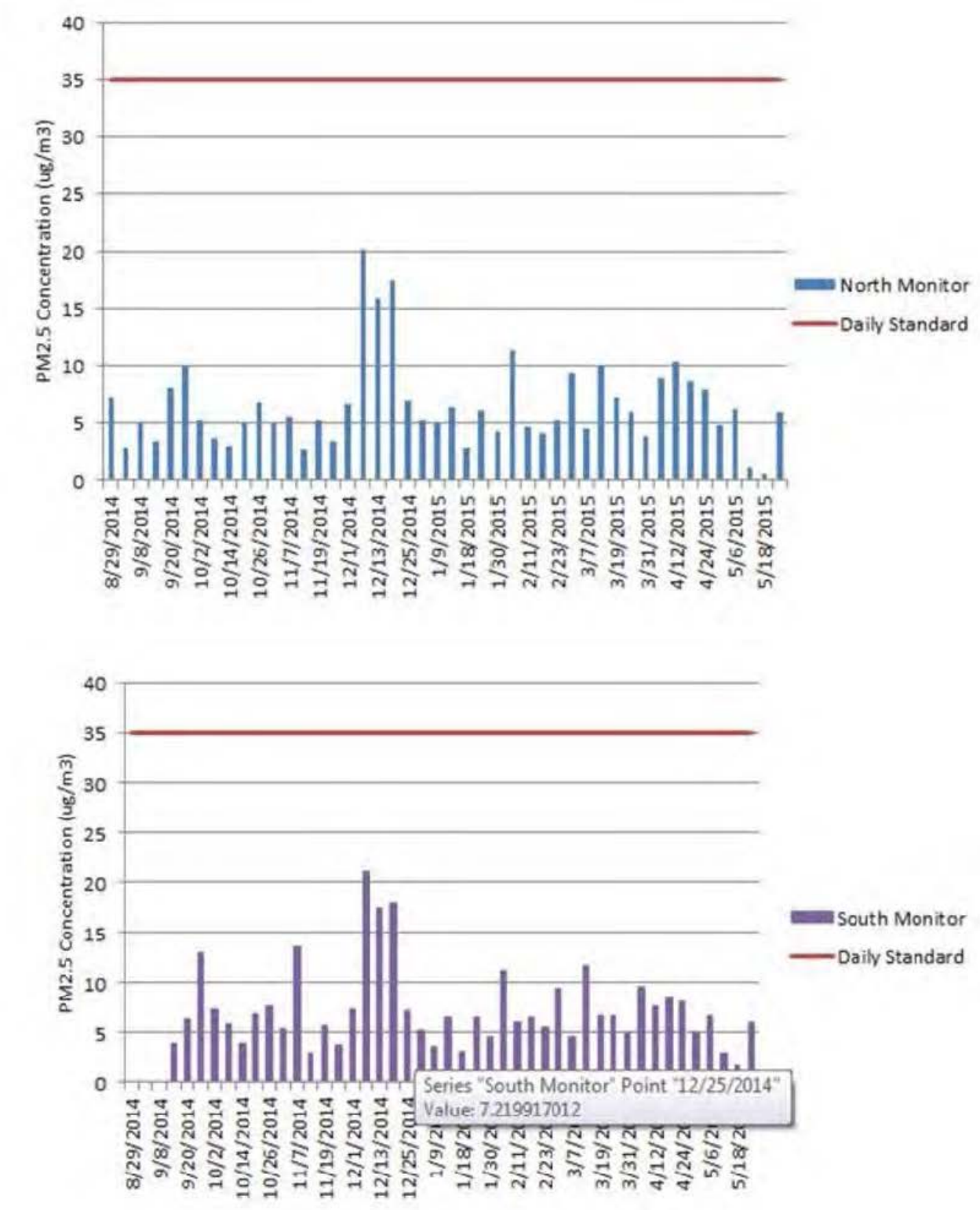


Figure xmankato2.5 PM2.5 measurements show no exceedances of they daily PM2.5. Three full years of data are required to assess whether annual standards have been violated.

EOG, Chippewa Falls, Wisconsin

In addition to fenceline monitoring conducted by the MPCA, multiple fence line monitoring studies were conducted by Dr. John Richards of ACT. These studies examined three different aspects of air quality near frac sand facilities to determine the potential impact of these facilities on the environment: how much respirable crystalline silica is in the air, how much is being contributed from the mines and processing plant, and how does this compare with baseline ambient air testing from around the state.

Dr. Richards and Brozel were sought to conduct this study because these scientists developed a sampling technique for PM4 crystalline silica based on EPA design and operation requirements for PM2.5 samples in 2006. These sampling methods have been approved, and used by, state regulatory agencies such as the California South Coast Air Quality Management District and MPCA for sampling for RCS in the ambient air.[6]

Prior to the start of this sampling program in 2012, very little ambient respirable crystalline silica data were available that were applicable to communities near frac sand-producing facilities. Both the Wisconsin Department of Natural Resources (WDNR) and the Minnesota Pollution Control Agency (MPCA) expressed concerns regarding this lack of relevant exposure data. Sand mining and processing plants in Wisconsin decided to apply this new ambient respirable crystalline silica sampling technique to address questions and concerns raised in numerous communities near sand-producing facilities. The study presented in this paper is the first large-scale, long-term application of this measurement method.[7]

Samplers at four different facilities (one processing plant and three industrial sand mines) operated on a once-every-third-day schedule. Sampling days matched the once-every-third-day calendar schedule published by the U.S. EPA and used in U.S. EPA and state agency air monitoring networks because matching these sampling allowed the data generated using the ambient PM4 particulate matter samplers at the industrial sand facilities to be compared with background data generated simultaneously with state agency PM2.5 samplers.

This study consists of 2128 twenty-four hour samples, establishing a long-term data set from which good conclusions can be drawn. Additionally, the WDNR audited all twelve samplers once during the long-term sampling program. [8]

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[6] John Richards and Ted Brozell, "Fenceline PM4 crystalline silica concentrations near sand mining and processing facilities in Wisconsin," Mining Engineering, October 2015, http://www.wisconsinsand.org/assets/John_Richards_Study_MEOct2015-53-59.pdf.

[7] Richards, J.; Brozell, T. Assessment of Community Exposure to Ambient Respirable Crystalline Silica near Frac Sand Processing Facilities. *Atmosphere* **2015**, *6*, 960-982, http://www.mdpi.com/2073-4433/6/8/960/htm.

[8] Richards, J.; Brozell, T. Assessment of Community Exposure to Ambient Respirable Crystalline Silica near Frac Sand Processing Facilities. *Atmosphere* **2015**, *6*, 960-982, http://www.mdpi.com/2073-4433/6/8/960/htm.

The presence of twelve PM4 particulate matter samplers at these facilities in two adjacent counties is an especially dense population of ambient air monitors. For comparison purposes, there are only twenty-three state-operated PM2.5 samplers in the entire state of Wisconsin

Upwind-to-downwind concentration differences across the facility were evaluated by compiling data for each of the four facilities from those sampling days in which the winds passed either from Location 2 to Location 1 or Location 1 to Location 2. Local background concentrations were calculated using data from both locations during days when the winds passed in a crossflow pattern to the axis of the samplers.

These methods were used because it allowed the ambient data compiled with this measurement method to be directly comparable to the extensive health effects database compiled over the past 30 years concerning occupational exposure to respirable crystalline silica.

None of the facilities experienced levels of RCS that exceeded the California or Minnesota health-based standards. In fact, values for RCS in the sixteen data sets were so low, 88 percent of the of the 2128 samples had concentrations so low they were not able to be detected, meaning concentrations were below 0.31 µg/m3, approximately one-tenth of the OEHHA and MNDOH health-based standards (See Figure xrcschippewafalls).[9]

Additionally, the highest values of RCS detected (the upper 99% percentile values) ranged from 0.31 µg/m3 at Chippewa Falls Location 2 (2014 data set) to 1.44 µg/m3 at S&S Mine Location 2 (Oct. 2012–Dec. 2013 data set). These values are independent of the LOQ and indicate there were small amounts of variability of the 24 hour average data.[10]

This has a strong bias to higher-than-true mean values considering that the histograms of the detectable values do not indicate that a large number of below-LOQ values were just below the LOQ.

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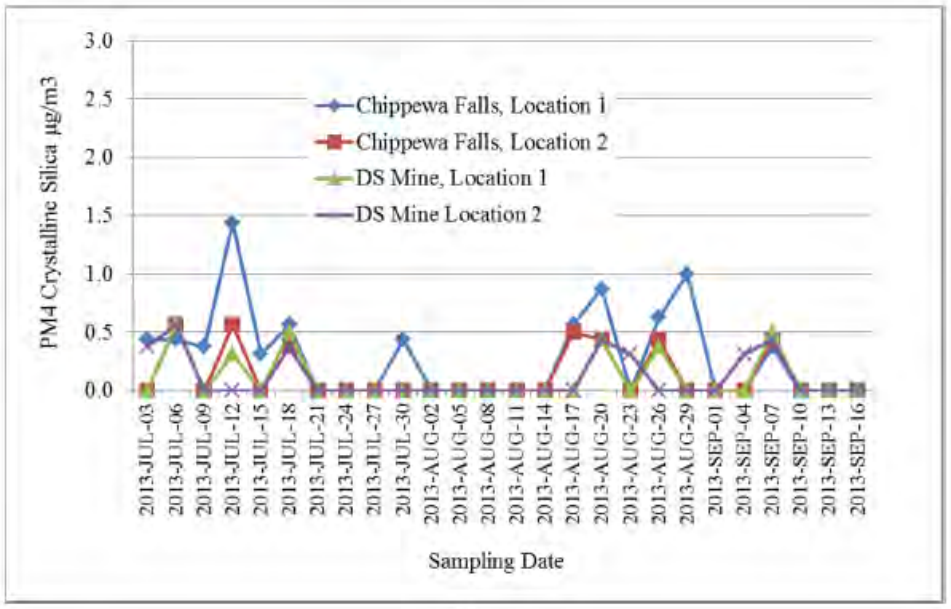
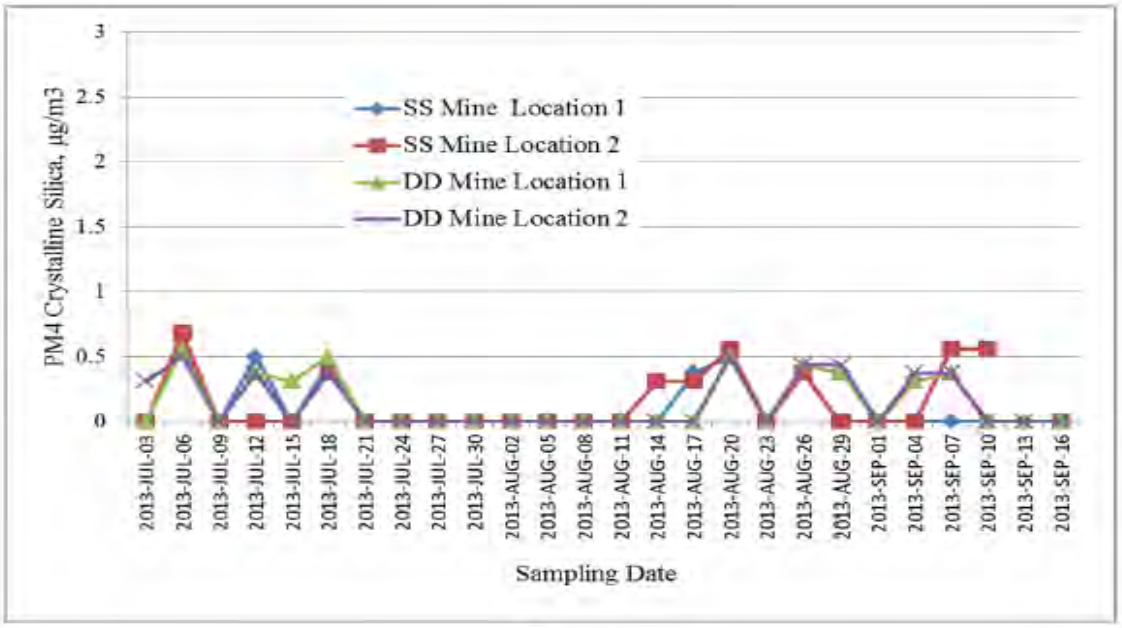
[9] Richards, J.; Brozell, T. Assessment of Community Exposure to Ambient Respirable Crystalline Silica near Frac Sand Processing Facilities. *Atmosphere* **2015**, *6*, 960-982, http://www.mdpi.com/2073-4433/6/8/960/htm.

[10] Richards, J.; Brozell, T. Assessment of Community Exposure to Ambient Respirable Crystalline Silica near Frac Sand Processing Facilities. *Atmosphere* **2015**, *6*, 960-982, http://www.mdpi.com/2073-4433/6/8/960/htm.



(a)



(b)

Figure xrcschippewafalls. Levels of RCS were below the detection limit on 88 percent of the 2128 days sampled, and when RCS was able to be detected, it was far below levels considered dangerous for chronic exposure. These findings strongly suggest it is not possible for industrial sand facilities to become a source of environmental silicosis. The graphs show variations of PM4 RCS concentrations over times. (a) shows variations in PM4 RCS concentrations at the Chippewa Falls plant and DS mine from July 3, 2013, to September 16, 2013, and (b) shows variations from July 3, 2013 to September 16, 2013.

The consistent variations observed throughout the multi-year sampling program in the sampling suggests concentrations of RCS measured at fencelines are in the local background range for Western Wisconsin. This finding was further reinforced by the fact that both the S&S and DD mines shown in figure (b) were not in operation during the two-and one half moth period shown in in the figure (b), but still had RCS concentrations that were very similar to those shown in figure (a).

While understanding total RCS concentrations is important, it is also important to be able to determine how much RCS is generated by each facility. This is done by conducting upwind and downwind sampling. Upwind samples take an initial measurement, or a baseline, and measurements at downwind facilities show concentrations downwind, the difference between the two allows us to assess the impact of the facility on air quality. Think of it this way; (Downwind Measurement-Upwind Measurement = contribution of the industrial sand facility to RCS).

Differences in upwind-to-downwind measurements in the 24 h average concentrations at the four locations ranged from approximately −1.4 μg/m3 to +1.5 μg/m3. The upwind-to-downwind differences in the respirable crystalline silica concentrations were very small at all four facilities sampled. Also, there was no detectable change in the upwind-to-downwind concentrations on 78% of the days during which the winds moved in a consistent and identifiable upwind-to-downwind direction (See Figure xdifferencechip.)

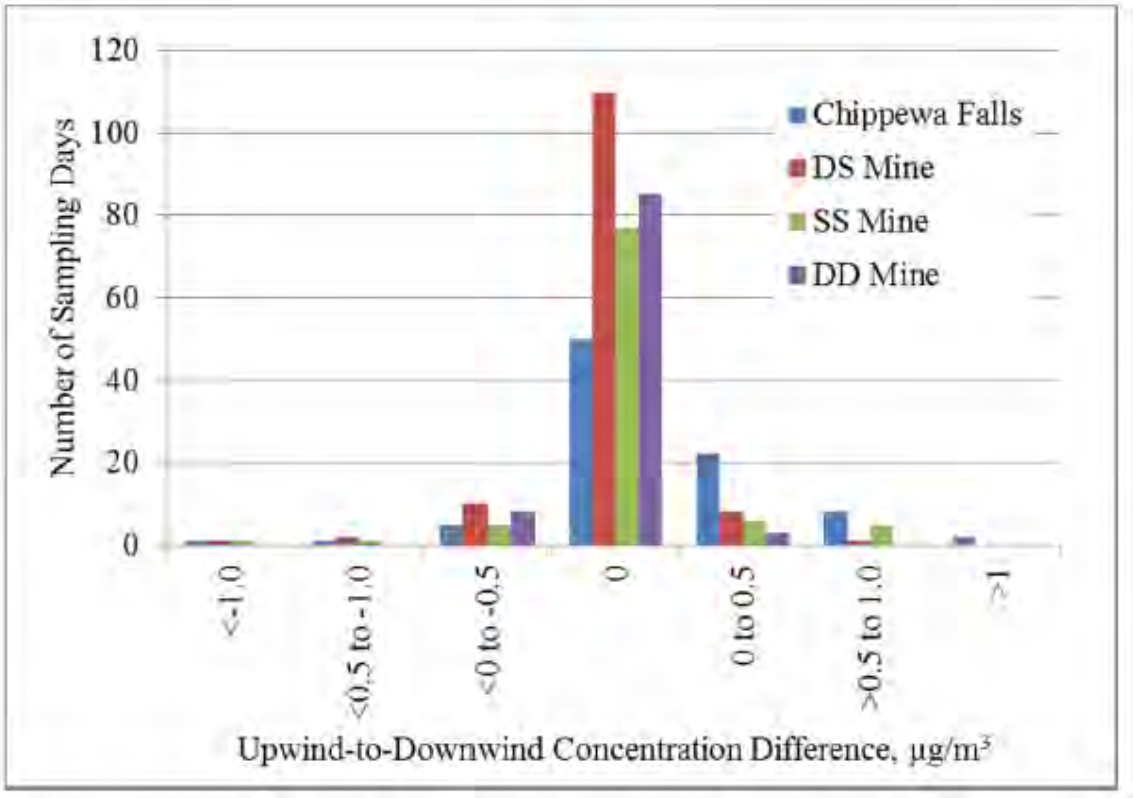


Figure xdifferencechip. Upwind-to-downwind PM4 crystalline silica concentration differences, October 2012 to December 2013.There was no difference between upwind and downwind values on 78 percent of the days sampled, indicating these facilities did not contribute to RCS levels on a majority of the days sampled.

These very small upwind-to-downwind concentration increases and decreases indicate that the sand mining and processing facilities contribute very little, if anything, to the ambient respirable crystalline silica concentrations and suggest the observed concentrations were due to local background concentrations of RCS. Background levels of RCS can come from a variety of sources, including farm fields, dirt roads, and construction sites.

Measuring total concentrations of silica dust and measuring at upwind and downwind locations resulted in finding low levels of RCS near these facilities and strongly suggest these facilities do no contribute to RCS concentrations; however they do not explain why some days had more particulate matter than others.

To understand why there was such a variation in particulates from one day to another, the researchers at ACT compared the PM4 concentrations measured at the Chippewa Falls processing plant with a WDNR-operated PM2.5 monitoring site in Eau Claire, Wisconsin twenty three kilometers away from Chippewa Falls. This is possible because PM4 monitors collect particles sized 4 microns and smaller, including all particles that would be gathered by a PM2.5 monitor.

Results from the monitors show day-to-day variations in local PM2.5 particulate matter concentrations measured by WDNR at Eau Claire are very similar to the day-to-day variations in PM4 particulate matter concentrations at both locations at Chippewa Falls (See figures xbackgroundpm). These closely-related variations suggest most of the PM4 particulate matter measured at Chippewa Falls was background PM2.5 particulate matter from sources throughout the region (See figure xpm2.5vpm4).

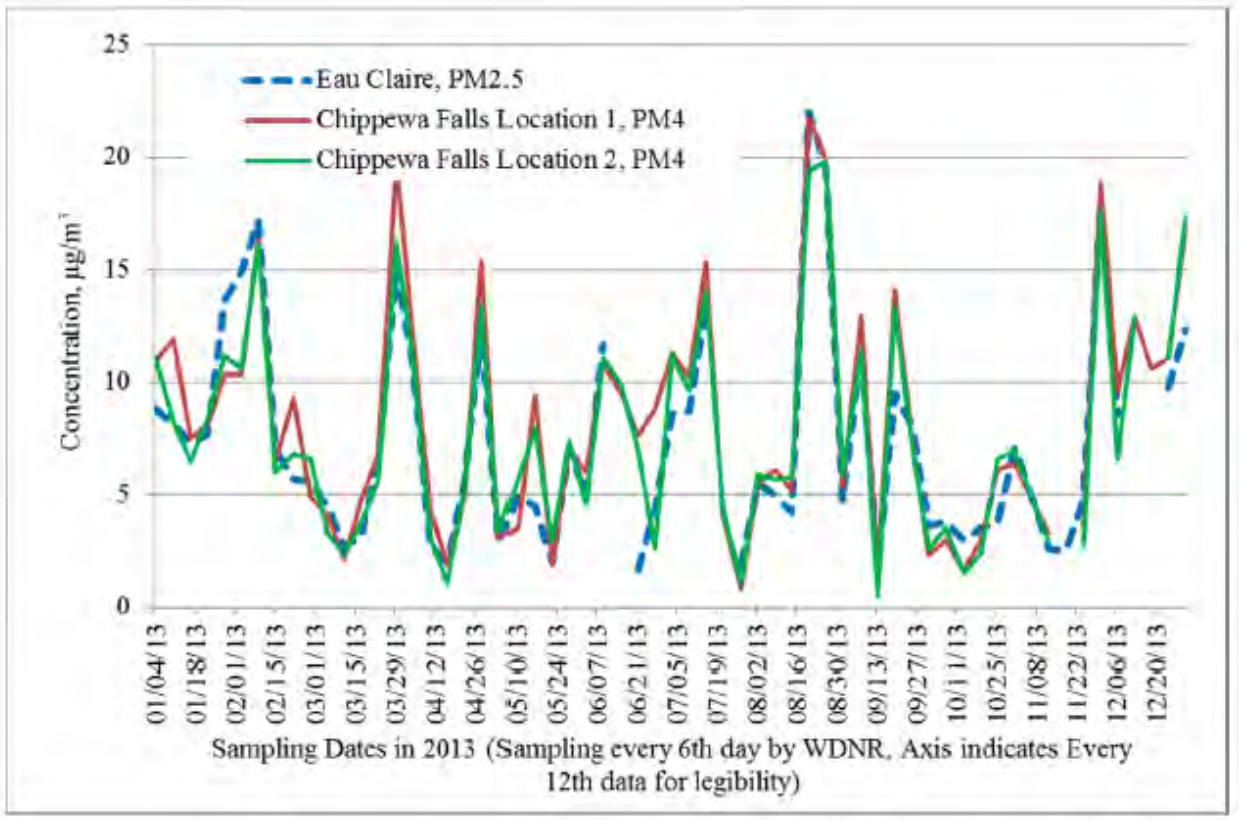


Figure xpm2.5vpm4**.** Comparison of the WDNR PM2.5 data from Eau Claire with the PM4 particulate matter data from Chippewa Falls Locations 1 and 2, October 2012–December 2013.

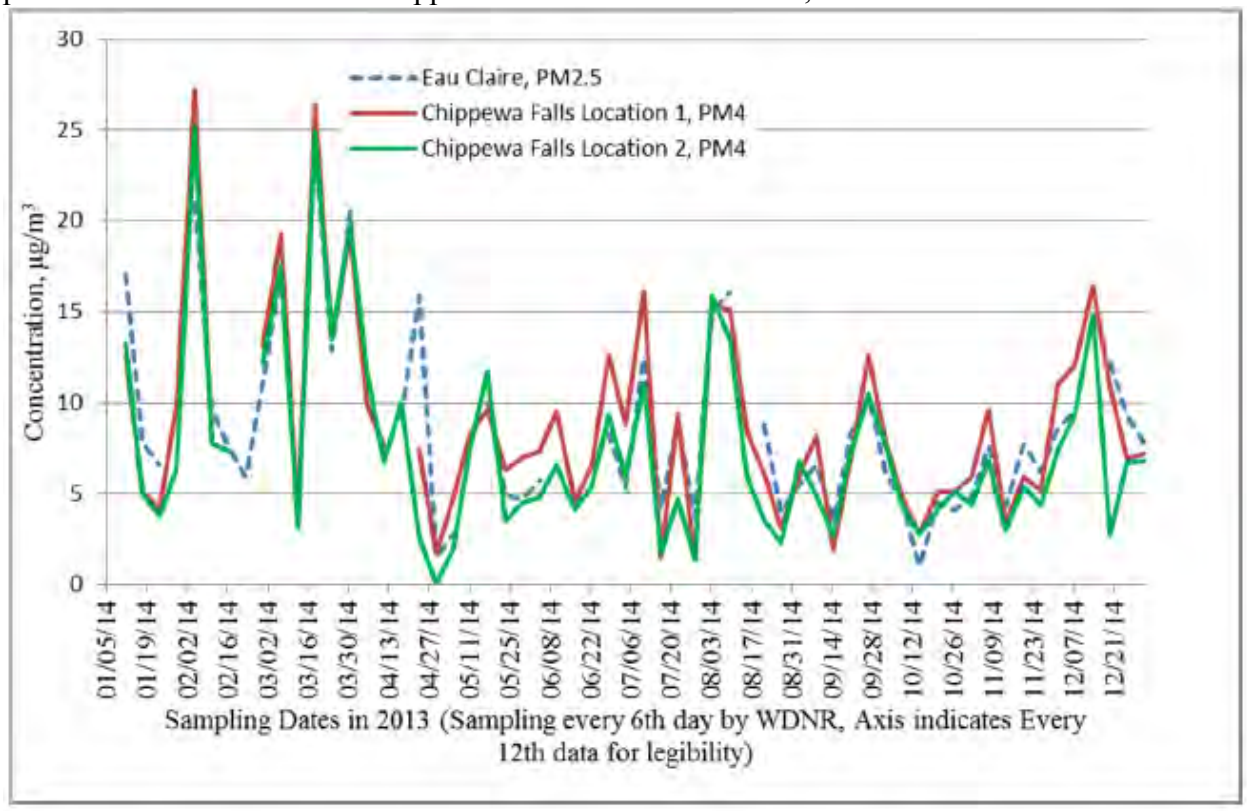


Figure xpm2.5vpm4**.** Comparison of the WDNR PM2.5 data from Eau Claire with the PM4 particulate matter data from Chippewa Falls Locations 1 and 2, January 2014–December 2014.

When differences in PM concentrations were observed, Richards found they were primarily due to nearby major highway and urban sources that affected PM2.5 particulate matter air quality near the WDNR Eau Claire PM2.5 sampler but not the Chippewa Falls PM4 particulate matter samplers.

Because the values for PM2.5 and PM4 particulate matter were so close, and generally followed the same trends, it suggests that the daily variations in respirable crystalline silica regional air quality were primarily due to variations in the local background concentrations.[11]

Additionally, the long-term average respirable crystalline silica concentrations in this study are similar to those measured by the Minnesota Pollution Control Agency (MPCA) in Winona and Stanton, Minnesota, discussed below in the section discussing the impact of transportation of industrial sand on air quality. The MPCA used sampling and analytical procedures similar to those employed by Richards and Brozell of ACT in this study in Wisconsin.

These findings of this study led the researchers at ACT to conclude that the exposure to respirable crystalline silica near frac sand producing facilities is the same as exposures in areas throughout this region because there were no significant differences in the upwind-to-downwind long-term concentrations for the three sand-producing mines and the processing plant and the measured respirable crystalline silica levels were in the background concentration range.

RCS concentrations for the entire data set of 2128 twenty-four hour respirable crystalline silica measurements and the long-term averages at each of the four facilities were less than 10% of the California OEHHA [1] 70-year chronic reference level of 3.0 μg/m3 and were consistent with background concentrations throughout the upper Midwest of the U.S.

The long-term average PM4 crystalline silica concentrations measured at the four facilities were very similar to estimated maximum crystalline silica concentrations calculated by the WDNR [9] based on PM2.5 elemental silicon data compiled from 2001 to 2009 at three U.S. EPA-operated PM2.5 speciation sites in Wisconsin

Fairmont Santrol, Mathy Construction, U.S. Silica, Maiden Rock, Wisconsin

In addition to monitoring at four EOG facilities near Chippewa Falls, Wisconsin, researchers at ACT conducted air monitoring studies at Fairmount Santrol Inc., Mathy Construction Inc. and

[11] Richards, J.; Brozell, T. Assessment of Community Exposure to Ambient Respirable Crystalline Silica near Frac Sand Processing Facilities. *Atmosphere* **2015**, *6*, 960-982, http://www.mdpi.com/2073-4433/6/8/960/htm.

U.S. Silica facilities.[12] In this study, a total of 657 24-hr sample values were taken from a total of seven different sampling locations. Six of the seven samples were taken near industrial sand facilities, and Cataract Green was a "control" area where no industrial sand facilities were present. Cataract Green was also not located near farm fields, or unpaved roads, which are also a source of RCS, allowing the researchers to establish background concentrations of RCS in the area.

Results from this study, like the study at EOG facilities near Chippewa Falls, found the long-term average ambient PM4 crystalline silica concentrations were low at all of the sampling locations. A majority of crystalline silica samples taken at six locations were below levels that could be detected (the LOQ of .3µg/m^3) and average RCS values for all seven locations sampled were far below the health-based standard of 3µg/m^3 established by California and Minnesota health officials (See table xrichards2). Even the highest concentrations, found at the Maiden Rock Southwest monitoring station, were 43.7 percent lower than levels considered hazardous assuming constant exposure to RCS for a seventy-year lifespan.

Summary of 24-hr PM4 crystalline silica measurements.

Sampling location	No. of 24-hr samples	No. of samples above LOQ	Arithmetic average concentration (microgram/m^3), values < LOQ treated as 0.0	Arithmetic average concentration (microgram/m^3), values < LOQ treated as LOQ/√2	99th percentile concentrations (microgram/m^3)
Maiden Rock Northwest	126	18	0.09	0.28	0.67
Maiden Rock Southwest	128	74	0.45	0.54	1.69
Maiden Rock Northeast	128	27	0.11	0.28	0.97
Sparta	90	10	0.05	0.24	0.51
Cataract Green	60	8	0.07	0.26	0.70
Downing West	62	12	0.11	0.29	1.10
Downing East	63	13	0.10	0.27	0.72
Weighted average			**0.15**	**0.32**	

Table xrichards2. This table shows the sampling location, number of samples taken, and results from each of the six industrial sand facilities, and the control area of Cataract Green. Results indicate levels of RCS at industrial sand facilities were similar to Cataract Green, suggesting these facilities do not generate large quantities of RCS.

The data compiled in the sampling studies at the four Wisconsin facilities indicate that the PM4 crystalline silica concentrations at the fencelines of sand-producing facilities are within the range

[12] John Richards and Ted Brozell, "Fenceline PM4 crystalline silica concentrations near sand mining and processing facilities in Wisconsin," Mining Engineering, October 2015, http://www.wisconsinsand.org/assets/John_Richards_Study_MEOct2015-53-59.pdf.

of local background concentrations, and therefore suggest these facilities are not responsible for generating hazardous levels of particulates.

Dust Generated by Transportation of Sand

Residents of communities near industrial sand sites have raised concerns that dust blowing from trucks hauling sand could be a source of hazardous respirable silica particles along transportation routes. Those concerns prompted authorities from the Minnesota Pollution Control Agency (MPCA) to conduct ambient air monitoring along a busy truck route in Winona, Minnesota.

Using the PM4 data gathered from this monitor, MPCA concluded dust from hauling industrial sand near the air monitoring location was not a threat to public health. MPCA data show dust levels were so low the air monitors could not detect any at all on 94.7 percent of the days sampled. When air monitors did detect dust, it was in concentrations near 15 percent of the chronic health benchmark used by MPCA.[13]

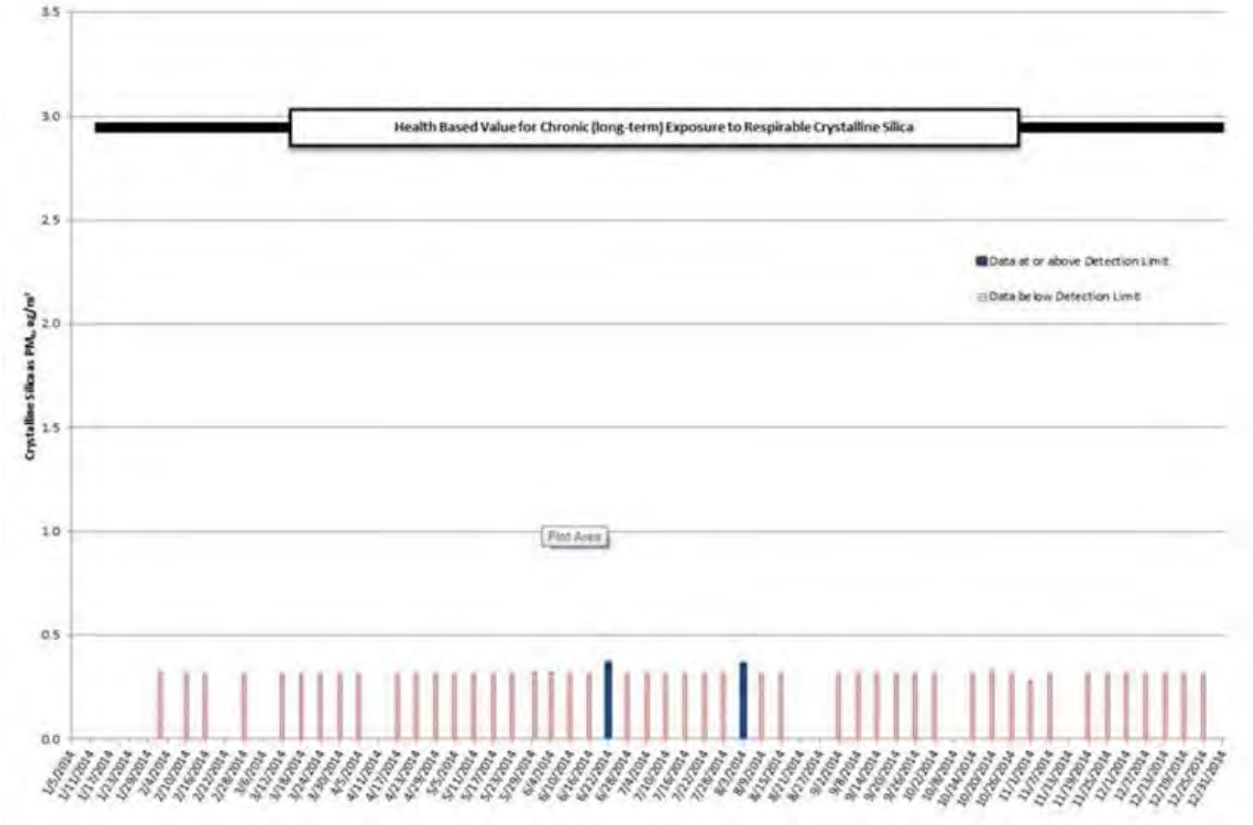


Figure xwinona. MPCA data from Winona, Minnesota indicate only two days out of 61 days sampled had any detectable amount of RCS, meaning levels of RCS were so low in Winona that they were unable to be detected on

[13] Zahra Hirji, "Trucks Hauling Frac Sand Not a Source of Lung Disease Dust, Data Shows," Inside Climate News, October 16, 2014, http://insideclimatenews.org/news/20141016/ trucks-hauling-frac-sand-not-source-lung-disease-dust-data-shows.

96.8 percent of the days sampled. Additionally, when RCS was detected, it was approximately 10 percent of the Califronai and Minnesota health-based limits.

MPCA selected the town of Stanton, Minnesota as a reference site to compare against RCS levels it recorded in Winona. Stanton does not have silica sand facilities or transportation but does have other sources of RCS, such as farm fields and unpaved roads. Stanton registered levels of RCS high enough to be detected on nine of the thirty three 24-hour samples taken, and these RCS were higher than the concentrations found in Winona, despite the fact Stanton has no industrial sand facilities (See Figure xstanton).[14,15]

These findings led the MPCA to conclude, "Airborne silica is a fairly ubiquitous pollutant and is not unique to silica sand mining and processing facilities."

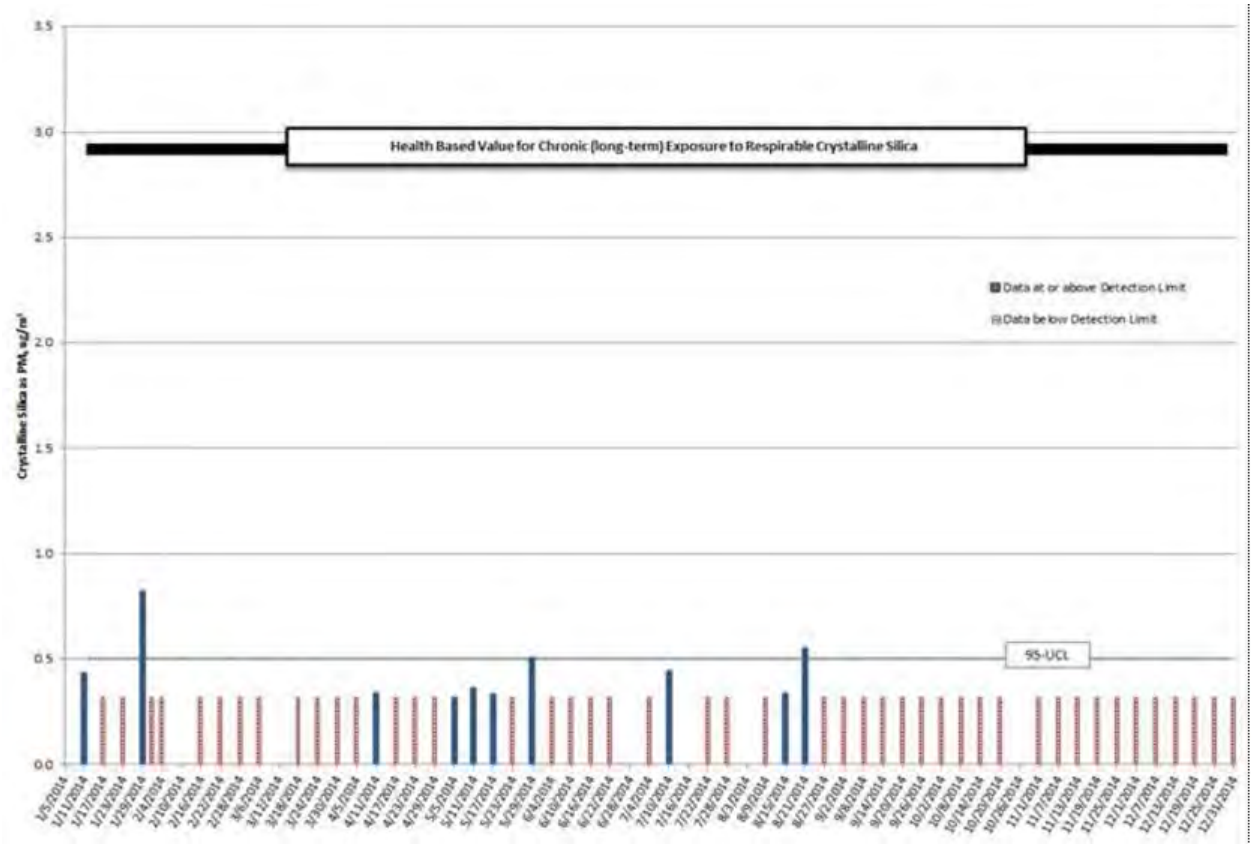
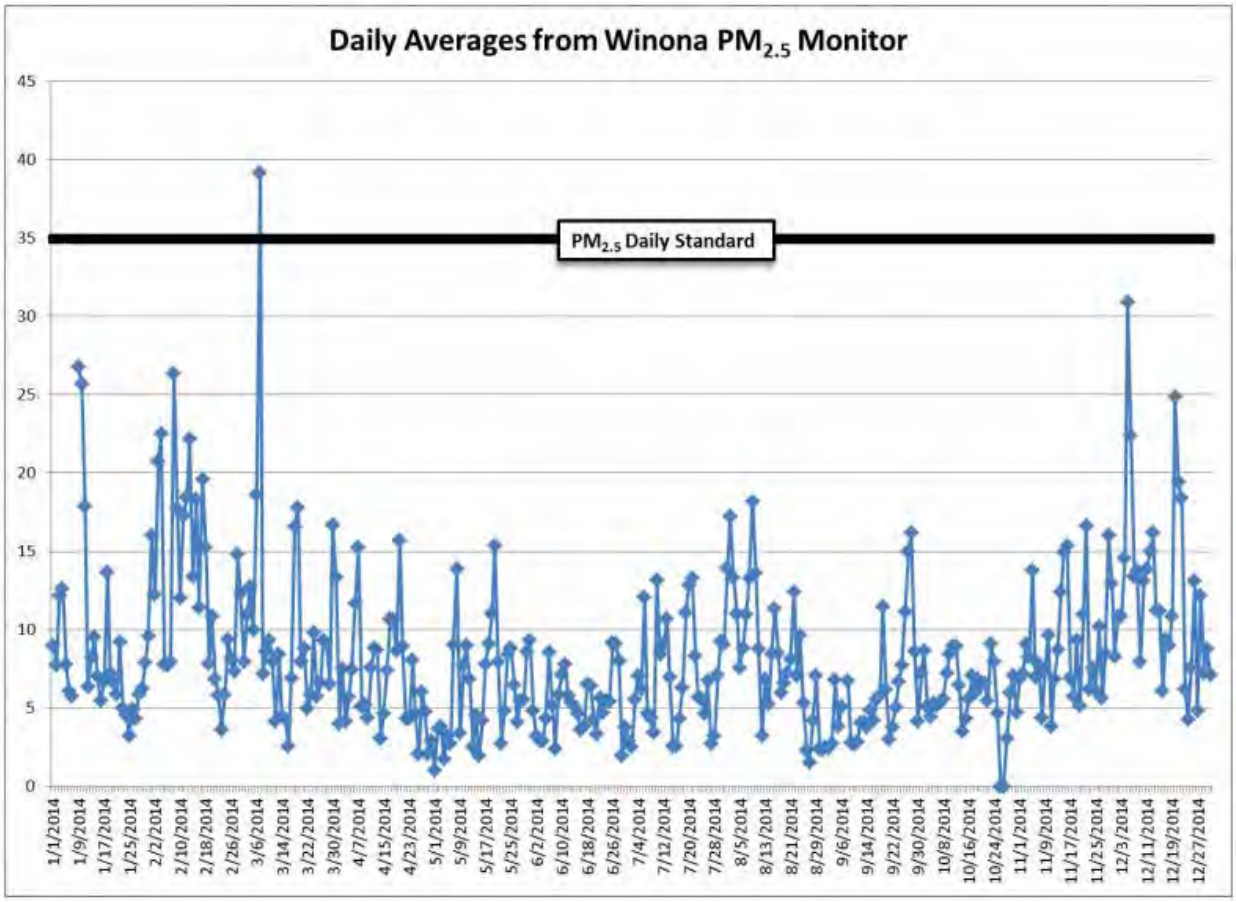


Figure xstanton. Despite having no industrial sand facilities near Stanton, Minnesota, concentrations of RCS were higher in this area than near the frac sand haul route in Winona, Minnesota. Levels of RCS in Stanton were likely due to agricultural activity or unpaved roads, and none of the sample days indicate RCS concentrations that could potentially result in negative health impacts.

[14] Minnesota Pollution Control Agency, "Air Monitoring at Minnesota Silica Sand Facilities," accessed March 10, 2015, http://www.pca.state.mn.us/index.php/air/air-quality-and-pollutants/ air-pollutants/silica-sand-mining/air-monitoring-data-at-minnesota-silica-sand-facilities.html#winona.

[15] Richards, J.; Brozell, T. Assessment of Community Exposure to Ambient Respirable Crystalline Silica near Frac Sand Processing Facilities. *Atmosphere* **2015**, *6*, 960-982, http://www.mdpi.com/2073-4433/6/8/960/htm.

PM2.5 concentrations measured by the MPCA in Winona were also below levels considered dangerous by the US EPA (see figure xpm2.5winona). Out of all the days sampled, there was only one day which exceeded the NAAQS, which the MPCA attributed to a weather pattern that impacted much of the central and eastern United States, and MPCA does not believe fine particle pollution associated with silica sand operations caused the exceedance in Winona.[16]



Additionally, the MPCA conducted air monitoring at the Titan Lansing transload facility (a facility where sand is processed and loaded into train cars) located in North Branch Minnesota to assess the impact of sand processing and transportation on air quality.[17] Respirable crystalline silica (PM4) is monitored at the northwest and south sides of the Titan Lansing Transload fence line at a 1 in 6 day frequency. Monitoring began at the site in January 2013, and are ongoing at the time this study was written in April 2016.

[16] Minnesota Pollution Control Agency, "Winona - Community Ambient Air Monitoring," State of Minnesota, May 2015, https://www.pca.state.mn.us/sites/default/files/g-85-03.pdf.

[17] Minnesota Pollution Control Agency, "Titan Lansing Transload Ambient Air Monitoring Data Report," State of Minnesota, 2015, https://www.pca.state.mn.us/sites/default/files/g-13-03.pdf.

MPCA reports the collected data were below the respirable silica health based value and did not suggest any exceedances of ambient air quality standards. Furthermore, the data indicates levels of RCS and were below the detection limit on the vast majorities of days sampled, and the data show no days in which the standards for PM2.5 or PM10 were exceeded.[18]

In summary, results from several studies assessing the impact of industrial sand facilities on air quality have found these facilities have not generated hazardous concentrations of silica dust, and concentrations measured near these facilities have been similar, and sometimes below, concentrations of silica dust in "control" areas where there are no industrial sand facilities.

Part 2

Understanding the Limitations of PM2.5 Airborne Particles Near Frac Sand Operations by Walters et al. and Other work by Dr. Crispin Pierce

The initial lack of readily-available air quality data at the beginning of 2010, when the industrial sand industry began experiencing rapid growth in Wisconsin and other areas, led to the creation of a vacuum of information. When these vacuums exist, they are typically filled by the loudest voices in a room, not

Opponents of industrial sand mining often cite an article published in the *Journal of Environmental Health* entitled "PM 2.5 Airborne Particles Near Frac Sand Operations," as a means of promoting their belief that industrial sand facilities are negatively impacting air quality.[19,20] This study, which is formally credited to Walters et. al, is largely the result of the work by Dr. Crispin Pierce, a professor of public health at the University of Wisconsin, Eau Claire, who served as the faculty advisor for this study.

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[18] Minnesota Pollution Control Agency, "Titan Lansing Transload Ambient Air Monitoring Data Report," State of Minnesota, 2015, https://www.pca.state.mn.us/sites/default/files/g-13-03.pdf.

[19] Walters et al., "PM2.5 Airborne Particulates Near Frac Sand Operations," *The Journal of Environmental Health,* November 2015, http://www.thewheelerreport.com/wheeler_docs/files/0210meainfo.pdf.

[20] Kellan McLemore et al., "Re: MEA's Technical Support Letter to IWHI Concerning the Health Impact Assessment of Industrial Sand Mining in Western Wisconsin," Midwest Environmental Advocates, February 9, 2016, file:///C:/Users/Isaac/Downloads/2016_02-09_MEA%20Letter%20to%20IWHI-Re_HIA%20(1).pdf.

Despite being published in a peer-reviewed, academic journal, there are serious limitations to this study which are not clearly explained in layman's terms in the article. Unfortunately, these limitations compromise the study's findings and render the data collected of little or no use in furthering our understanding the impact of industrial sand facilities on air quality. Additionally, the study contains highly-misleading statements that are demonstrably false. It is for these reasons the Institute for Wisconsin's Health Incorporated, a non-profit, non-partisan, organization which conducted an extensive Health Impact Assessment of the industrial sand mining in Western Wisconsin concluded about the study:

"It should be noted that researchers have conducted additional community-level ambient air quality monitoring for PM2.5 in western Wisconsin in the vicinity of industrial sand facilities. Walters, et al. (2015) measured PM2.5 at four industrial sand sites, collecting a total of six measurements ranging in length from approximately 6 hours to 25 hours in length.

The equipment and methods used in this study did not meet the EPA Federal Reference Method for ambient air data collection, and not all samples represented a full 24-hour average. In addition, wind direction, wind speed, and distance to other possible particulate sources were not published as part of this study. Based on these deviations from approved air monitoring standards and the partial nature of the dataset, the research team did not find the study contributed to understanding of the issue."[21]

This *Policy Study* seeks to clearly explain the limitations of this study, and other work presented by Dr. Pierce, because stakeholders are often presented with this information without being properly educated on the reasons why this study does not contribute to our collective, scientific understanding of this issue. Furthermore, it is important that people living near industrial sand facilities fully understand this study should not be considered to be of equal quality to the data collected by MPCA, the WDNR, or the scientists at ACT because proper equipment and protocols were not followed.

Results

The results of the Pierce study are heavily influenced by the limitations of the sampling equipment and methodology. Of the six samples taken, five of the samples register higher levels of PM2.5 than corresponding WDNR or MPCA monitors located nearby, with Site 2 being the only site which registered lower levels than DNR readings at LaCrosse and Eau Claire (See Figure xddchart).

[21] Audrey Boerher et. al. "Health Impact Assessment of Industrial Sand Mining in Western Wisconsin," Jaunuary 19, 2016, http://www.instituteforwihealth.org/hia.html.

This has led some people to believe industrial sand facilities are significant contributors to PM2.5 levels and leading to much higher PM2.5 concentrations than the surrounding areas, however, this way this study was conducted means it offers no scientific evidence to support these beliefs.

For example, one sample, taken at Site 4, shows PM2.5 concentrations at 50µg/m^3 which is substantially higher than the 35µg/m^3 daily standard, however this sample consisted of only six hours of sampling with equipment that was not capable of taking accurate measurements. Taken together, (come up with an analogy). More details explaining the shortcomings of each aspect of this study are discussed below.

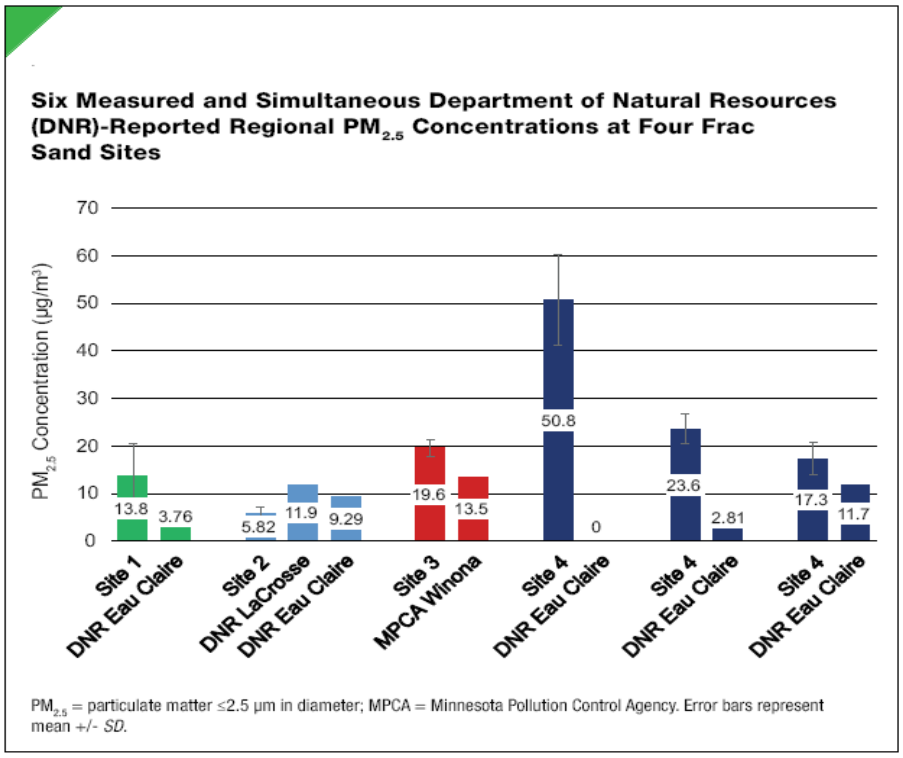


Figure xddchart. This chart shows the six data samples collected at four different locations. U.S. EPA FRM standards require samples be taken every (three or six?) days over a three-year period to draw accurate conclusions about air quality. The number of samples collected in the Pierce study constitutes only (calculate percentage) of the required sampling days. Additionally, the sampler located at Site 4 only collected data for six hours, meaning it is not a 24 hour sample that should be compared with the rest of the data obtained.

Equipment Shortcomings

Air sampling is a delicate process, and for this reason, the US EPA only certifies certain sampling equipment which is sensitive enough to accurately measure concentrations of fine

particles. Using the proper equipment is absolutely essential to providing quality, scientific information, unfortunately, none of the air sampling equipment used in *PM 2.5 Airborne Particles Near Frac Sand Operations* was EPA certified, meaning it cannot accurately quantify PM2.5.

Instead of using EPA-certified Federal Reference Method (FRM) samplers, non-EPA certified filter-based samplers (SKC DPS) were used to conduct the analysis. Although these samplers are sometimes used by the U.S. Army, they are unable to accurately measure PM2.5 because (add a reason)

Despite Dr. Pierce's knowledge of the limitations of the equipment, no easily-understandable disclaimer was made in the journal article to give stakeholders an accurate understanding of the margin of error in data collection or the uncertainties of the study. Although portions of the article showed this statistical uncertainty of the data collected, these limitations were presented as complicated statistical calculations and not presented in any way in which the general public could be reasonably be expected to understand, such an explanation would have been beneficial for readers, and the study.

Another misleading claim regarding equipment in the Pierce study is the assertion that by locating and testing direct-reading instruments alongside U.S. EPA FRM instruments, local governments and health departments will have more options in the future for testing air quality by using less-expensive, easy-to-interpret instruments.

According to the study: "Colocation and testing of direct-reading instruments with U.S. EPA FRM instruments would provide options for testing of air quality by local health departments using less-expensive and easy-to-interpret instruments."

This claim is inaccurate and misleading because it assumes the readings from direct reading instruments can be calibrated to correspond with the results obtained using EPA FRM equipment, however no evidence is offered to back up this assertion. It is highly unlikely such a conversion factor exists because the handheld TSI DustTrak 8520 and 8530 units are unable to distinguish between water vapor in the air and particulate matter, meaning they cannot provide reliable data on PM2.5 because factors such as humidity can alter the accuracy of the readings, a fact Dr. Pierce is aware of.[22]

If local governments purchase these less-expensive monitors, they will be no more capable of obtaining quality data than if they had purchased no monitors at all. Thus, local officials should

[22] Crispin Pierce, "What's in the Air Around Frac Sand Plants," Winchester Academy, February 25, 2015, https://www.youtube.com/watch?v=2P9s7k6RBs4.

be aware of this fact lest they spend limited governmental resources on monitors that cannot properly detect small PM2.5 particles.

Faulty Methodology

In science, methodology is like a recipe for cooking, if you do not follow the proper procedures the results do not turn out well. However in science, following the proper methods is not simply beneficial, it is absolutely essential to gathering data that are scientifically valid because using flawed methodology will lead to obtaining flawed results. (think of an analogy) Using spoiled milk will not make a good cake?

Unfortunately, the Pierce study failed to follow well-established methods for sampling air quality because the study did not have both upwind and downwind measurements, there were too few samples collected, some of the samples were not complete 24-hour samples, and wind direction, wind speed, and distance to other possible particulate sources were not published as part of this study. All of these factors result in flawed and inappropriate data.

Upwind Sampling

As discussed in *Part 1,* upwind and downwind measurements are important because the act like "before and after" pictures, like the ones you see might see at the gym. No upwind measurements were taken during any of the six samples taken. This fact, in addition to the fact none of the wind directions were made publicly available and the equipment used was not EPA-certified, makes it impossible for Dr. Pierce to determine whether these facilities have contributed to PM2.5 concentrations in the sample area because there is "before" measurement, using improper equipment to take an "after" shot is not helpful with understanding the impact of these facilities on air quality. Additionally, a lack of published wind direction data relative to the position of the industrial sand facility means the particulates could have come from other, nearby sources.

As discussed above, levels of particulate matter are influenced by several factors at regional and local scales. Without taking these factors into account by observing upwind and downwind measurements, the study shows only "after" shots with no context or background data.

Not enough samples

Whereas the samples collected by ACT, and the MPCA, represent 2128 24-hour samples at EOG facilities, 657 24-hour samples at U.S. Silica, Fairmont Santrol, and Mathy Construction, 44 24-hour samples Shakopee Sands, 46 24-hour samples at Jordan Sands LLC, 61 24-hour samples in Winona, and years of sample data collected at the Titan Transloading station, respectively, the Pierce study constituted only six samples at four locations. Only one of these locations, site 4, had multiple samples taken (See Figure xddchart). Additionally, although the abstract of the

study claims six-24 hour samples, the sample taken at Site 4, which shows PM2.5 concentrations at 50.8µg/m^3 was only taken over the course of 6 hours, which in addition to the other shortcomings of the data, likely contributed to the high levels of PM2.5.

The U.S. EPA regulates ambient PM2.5 both as the three-year annual average level of 12 µg/ m3 to protect against long-term health effects as well as the 98th percentile level of 35 µg/ m3 to protect against short-term effects (U.S. EPA, 2009). Determining whether the PM2.5 annual average of 12 µg/ m3 requires three years of data, however Dr. Pierce routinely shows the graph below with the annual PM2.5 average superimposed on these data (See Figure xannualline).

While Dr. Pierce may have placed this line on the chart to indicate that air quality could be at risk if these concentration of PM2.5 persisted, it is easy for non-scientists to look at this graph and get the impression these facilities may be having adverse impacts on their health, even though there is not enough data collected to support that belief.[23]

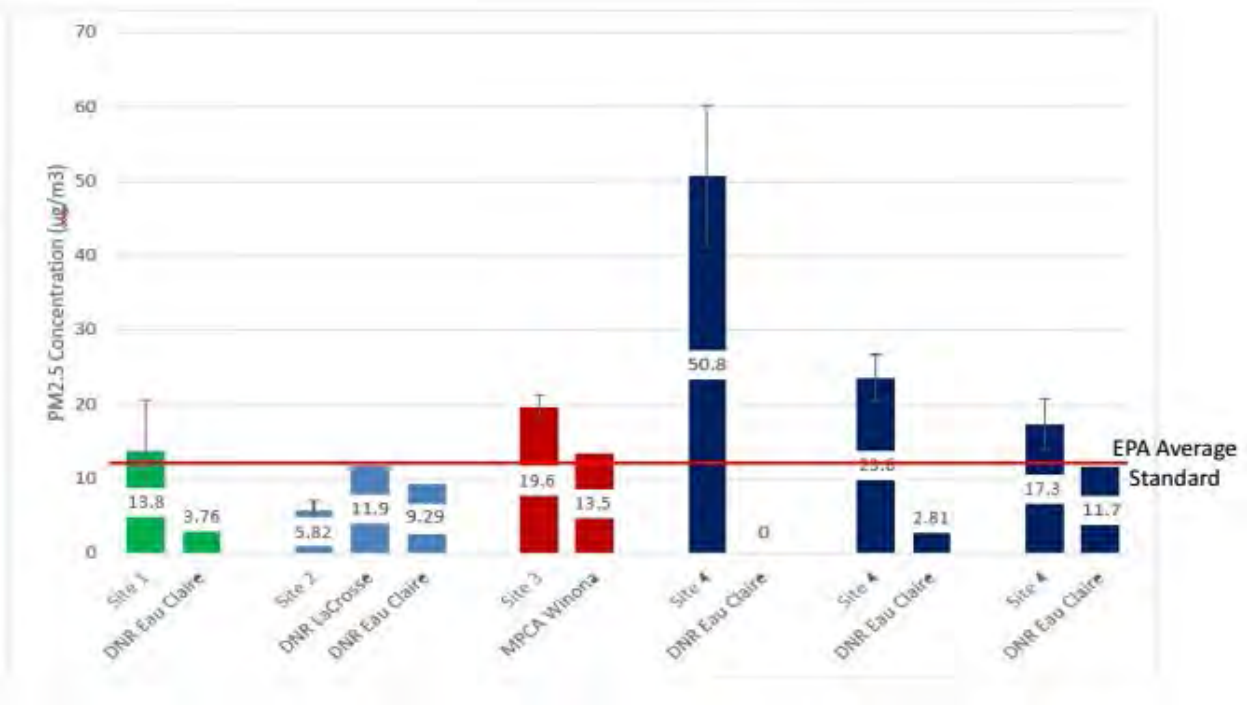


Figure xannualline. Three years of complete data using FRM equipment are required to determine regulatory compliance with the PM10 and PM2.5 annual ambient air quality standards.[24] Without this data, comparing 24-hour measurements to the annual standard is highly misleading, inappropriate, and causes people to become unnecessarily alarmed.

[23] Crispin Pierce, "What's in the Air Around Frac Sand Plants," Winchester Academy, February 25, 2015, https://www.youtube.com/watch?v=2P9s7k6RBs4.

[24] Minnesota Pollution Control Agency, "Titan Lansing Transload Ambient Air Monitoring Data Report," State of Minnesota, 2015, https://www.pca.state.mn.us/sites/default/files/g-13-03.pdf.

No Literature Review of PM2.5 Data Near Sand Plants

In addition to the limitations presented above, the Pierce study failed to conduct a literature review (which examines the results of other similar studies to provide context for the new study) of the PM2.5 data and PM4 data collected near industrial sand plants with which to compare their results. Conducting such a literature is standard practice and necessary for scientific papers, and the failure of the Pierce paper to include a review of the best-available scientific data shows sloppiness at best, and scientific incompetence at worst.

None of the studies discussed above were mentioned in Pierce's paper. In fact, the study claims to be the first publication, to the authors' knowledge, measuring PM2.5 concentrations near frac sand facilities. This claim is demonstrably false, as several studies, including studies conducted by the MPCA and ACT that were published *prior* to Pierce's paper.

This statement gives readers the impression that not only are the results of this study alarming, but also that there has been no previous studies examining the impact of frac sand facilities on air quality, a false and irresponsible claim, especially because these other studies which used proper equipment and methodology have quantified PM2.5 near frac sand facilities and concluded these facilities are not hazardous.

Concluding Remarks

For so-called scientists to design a study which could not possibly accurately quantify PM2.5, or measure how much particulate matter was being generated by industrial sand facilities to make such an irresponsible claim about being the first study to measure PM2.5 concentrations near frac sand facilities when many others have collected data actually using proper methods and equipment demonstrates gross incompetence, and this incompetence has serious, negative consequences for everyone.

In the Heath Impact Assessment conducted by the Institute for Wisconsin's Health Incorporated, the Institute concluded that stress and anxiety caused by the fear that industrial sand facilities could compromise health and decrease property values were likely. Stress and anxiety can cause negative health impacts like irritability, anxiety, depression, headaches, insomnia, raising the risk of hypertension, heart attacks, and strokes, can increase incidences of heartburn or acid reflux, and people under chronic stress are more susceptible to viral illnesses like influenza and the common cold.[25] The level of anxiety Dr. Pierce's alarming, but scientifically baseless study is likely to cause people living near industrial sand plants make Pierce's irresponsible work a greater health hazard than industrial sand operations themselves.

[25] The American Institute of Stress, "Stress Effects," Accessed April 26, 2016, http://www.stress.org/stress-effects/.

The limitations of the kind of research Dr. Pierce has conducted on the impact of industrial sand facilities over the past several years prompted the Wisconsin Department of Natural Resources to issue the following criticism of his work: "While the data from studies like Dr. Pierce's are of interest, the conclusions drawn are uncertain and of limited value due to the very limited sample sizes, and the fact that they employ non-federally approved sampling methodologies," which is a diplomatic way of saying this study is not useful.[26]

Although Pierce et al. stated they wanted to help local health departments and elected officials gain clarity to unanswered questions about the potential health risks of increasing frac sand mining, processing, transportation, and use in hydraulic fracturing, the data provided in this study have had the exact opposite result.

As air quality has become an issue of concern in areas near sand facilities, local governments have sought ways to measure potential emissions from sand facilities. Because of limited resources, these local governments may be tempted to use non-EPA certified equipment, which is not suited to the task at hand, to take air quality readings. Dr. Pierce's study could have had a silver lining if it had cautioned these governmental units against purchasing this equipment because of its unreliability. Instead, the alarming tone of this research will likely only serve to make people more fearful of these plants, even though the research is not credible and cause local governments to waste limited resources.

Air monitoring is critical to understanding the impact of industrial sand facilities, and nothing in this *Policy Study* in intended to downplay the importance of monitoring. In fact, this proper air monitoring is crucial for policymakers and local citizens, however when improper equipment and methods are used, it dilutes the results of properly conducted monitoring programs and is a detriment to all stakeholders.

This study is valuable because it demonstrates the equipment used by Pierce et al is inappropriate for obtaining accurate air quality data. As interest in conducting air monitoring among local government units has grown, this study provides valuable insight into the types of equipment required in order to properly measure levels of RCS and PM 2.5.

Unfortunately, Dr. Pierce's work on industrial sand mining is so poorly designed it has no value for furthering our understanding of the impact of frac sand facilities on air quality and reflects poorly on the University of Wisconsin- Eau Claire.

Also things to consider mentioning:

[26] http://wpt.org/Here_and_Now/new-study-examines-quality-air-mining-sites

Pierce complains about not being cited in HIA http://www.leadertelegram.com/News/Front-Page/2016/02/03/Sand-mining-health-troubles-link-downplayed-in-report.html

"I was disappointed because I felt like our data was kind of sidelined, and it's the only work that looked at these fine particles," Pierce said. "As a scientist, I want to look at all the information we have available and put together what we know about the risk at that point, and I don't think they did that."

Pierce uses PM10 graph that is doctored

Contacted the Journal of Environmental Health about learning more about the peer review process for this paper.

Jeff Falk used to be anti-mine, but has changed his attitude Three years is the requirement for monitoring and making a legal case- Jeff Falk, Tremp County Video. The three year period is used because it captures an average of wind conditions, and precipitation events.

Part Three
An analysis of Sandstone Cementation as a Potential Source of RCS

Examining potential reason why frac sand does not generate large quantities of harmful particles.

Studies by both the MPCA and ACT have demonstrated exceedingly low concentrations of RCS in areas near industrial silica sand mining, which are far below the levels considered hazardous by California and Minnesota Health Officials. The question to ask is, why?

Frac sand is used due, in part, to its especially high resistance to pulverization. High energy is needed to fracture small particles from the large grains of crystalline silica particles. One possible reason is due to this especially high resistance to fragmentation, the handling of frac sand has a low vulnerability to the formation of particles in the respirable size range.

The smallest grain size of frac sand that satisfies specifications set by the American Petroleum Association is 105 micrometers—a size that is more than 40 times larger in diameter and more than 70,000 times larger in mass than a respirable 4-micrometer (aerodynamic size) particle. The extraction, screening, and drying processes used in frac sand mining and processing do not impose the energy needed for significant attrition of the crystalline silica grains to form PM4 particles.[27]

[27] Richards, J.; Brozell, T. Assessment of Community Exposure to Ambient Respirable Crystalline Silica near Frac Sand Processing Facilities. *Atmosphere* **2015**, *6*, 960-982, http://www.mdpi.com/2073-4433/6/8/960/htm.

In order to have high concentrations of RCS, there must be a source of the small particulate material. If frac sand does not become fragmented during the mining process, another potential source of RCS could reside in the "cement" holding sand particles together within a sandstone formation (See Figure xcement). If this cement material has high concentrations of crystalline silica, it could be a potential source of small particles of silica dust, which makes studying the composition of the cement an important part of assessing potential risk.

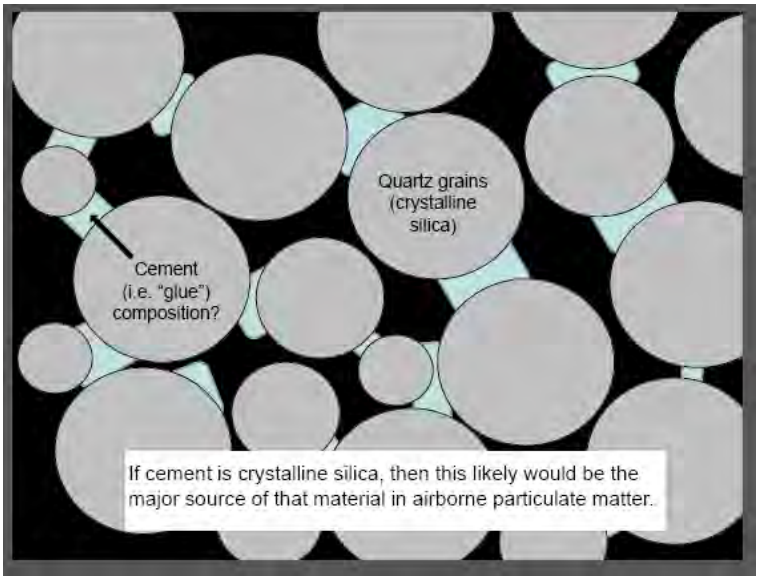


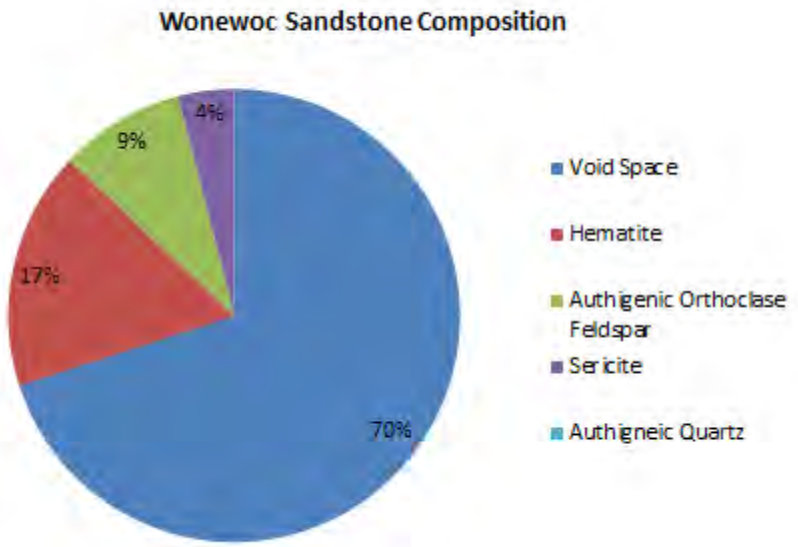
Figure xcement. Think of the sand grains as bricks, and the entire sandstone as a wall. The "mortar" or cement holds the sand grains together. If this cement is silica-based it could potentially be a source for respirable crystalline silica.

A study conducted by the Department of Geology at the University of Wisconsin- Eau Claire analyses the cement in the Jordan and Wonewoc Sandstone formations, two formations that are used extensively as a source of frac sand in Wisconsin and Minnesota, due to their ultra-pure composition; round, high-strength grains; and weak cementation, to determine if the cement in these formations contained high levels of silica cement.

Although this study has yet to be submitted to a peer reviewed journal, the results provide preliminary insights into the composition of cement material in the sandstone formations used for industrial silica sand mining in the upper Midwest.[28]

[28] Rachel Flifet et. al, "Diagenetic History of Cambrian Sandstone Units in Western Wisconsin: Implications for Resource Extraction, Geological Society of America *Abstracts with Programs.* Vol. 48, No. 5, Accessed April 26, 2016, https://gsa.confex.com/gsa/2016NC/webprogram/Paper275548.html.

Findings from the petrographic analysis of the Wonewoc Formation show the cement is composed largely of pore space (empty space in between sand grains), hematite, authigenic orthoclase feldspar, and small amounts of sericite (See Figure xcementwonewoc). The samples studied contained very small amounts of authigenic quartz, which could potentially be a source of respirable crystalline silica if it were present in high enough amounts.



[29]

Figure xcementwonewoc. 19 samples were collected and analyzed in the Wonewoc Formation. Void space constituted 70 percent of the interstitial space, hematite 17 percent, authigenic orthoclase feldspar 9 percent, sericite 4 percent, and authigenic quartz less than 1 percent.

The composition of the space between sand grains was similar in the Jordan Formation, where pore space constituted the majority of the space, followed by calcite, hematite, authigenic quartz, authigenic feldspar, and sericite (See Figure xjordancement). The larger concentrations of authigenic quartz in the Jordan Formation comes from samples that were obtained in the upper Jordan Formation near Arcadia, Wisconsin where quartz, which is composed of silica, makes up a greater share of the cement. However, because silica is so strong, these zones cannot be broken

[29] http://higherlogicdownload.s3.amazonaws.com/SMENET/1b517024-bb1c-4b2c-b742-0136ce7a009c/UploadedImages/TCjointConference/J%20Brian%20Mahoney%20-%20Cement%20in%20Camb.%20Sandstone%20Potential%20Respirable%20Silica.pdf

apart into useful frac sand grains, and rock from this area is treated as waste rock at industrial sand facilities in Wiscsonsin.[30]

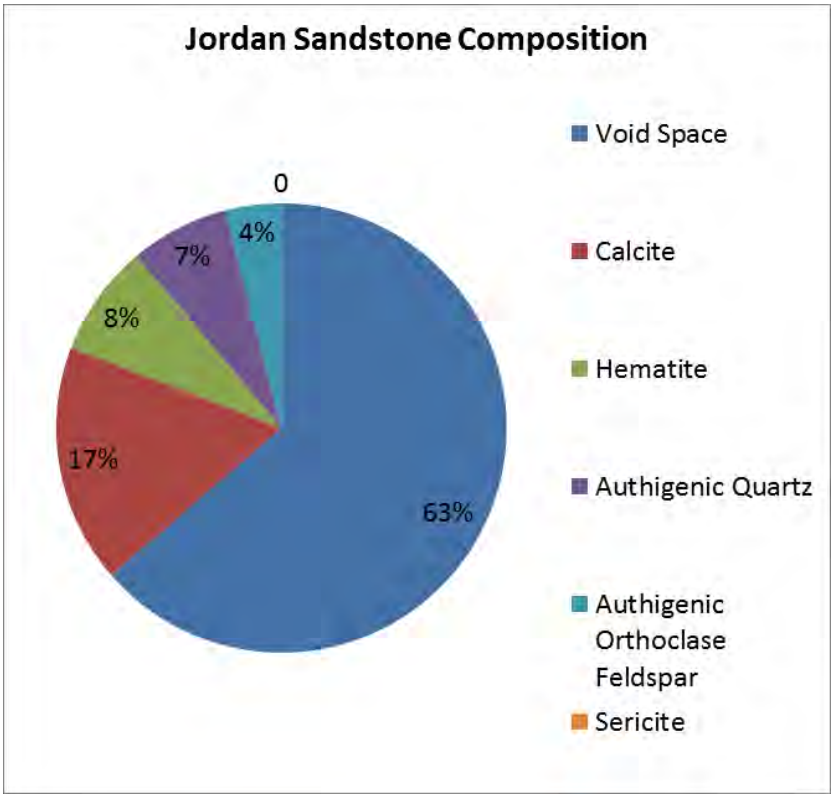


Figure **xjordancement** Interstitial spaces (Spaces in between sand grains) are occupied by voids, calcite, sericite, authigenic orthoclase feldspar, and hematite. After analyzing 30 samples in the Jordan Formation, Mahoney et al found these spaces contained void space (63%), calcite (17%), hematite (8%), authigenic quartz (7%), authigenic orthoclase feldspar (4%), and sericite (<1%).

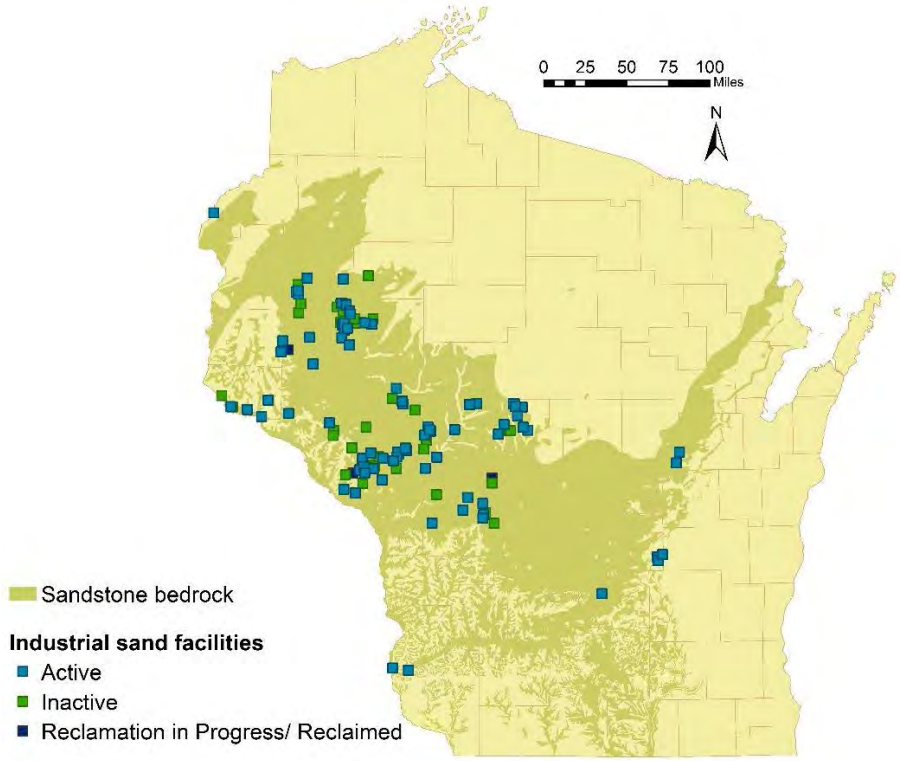
The lack of authigenic quartz cement implies that the respirable particulate matter generated from the mining process should be low in crystalline silica. More samples are needed enable statistical analysis to be conducted to determine whether these results are statistically significant.

Health Impact Assessment

Industrial sand facilities are also regulated through Ch. NR 440 *New Source Performance Standards* (particulate matter and opacity) and Ch. NR 445 *Hazardous Air Pollutants*. Air quality limits provided by WDNR air quality permits are determined based on computer-modeled maximum potential emissions from the facility and background (existing) air quality.[15] Sand mines are also

[30] http://higherlogicdownload.s3.amazonaws.com/SMENET/1b517024-bb1c-4b2c-b742-0136ce7a009c/UploadedImages/TCjointConference/J%20Brian%20Mahoney%20-%20Cement%20in%20Camb.%20Sandstone%20Potential%20Respirable%20Silica.pdf

required by NR 415 to write and follow a WDNR-approved fugitive dust plan. Fugitive dust plans are site-specific, but commonly include provisions for using water on roads and stockpiles, paving roads, following posted speed limits on the mine sites, minimizing dust production during blasting, and conducting other site-specific activities. [16] Adherence to the fugitive dust plan is evaluated during inspections by the WDNR. The WDNR Air Program conducts at least one full and two partial inspections at each active facility, each year (R. Walls, personal communication, October 21, 2015).



The National Ambient Air Quality Standard for PM10 is 150 µg/m3 (microgram per cubic meter). A potential PM source is considered compliant with the PM10 standard if the PM10 measurement doesn't exceed 150 µg/m3 more than once per year on average over three years. [20] This measure is the *primary standard*, that is, the standard which is most protective of public health including sensitive populations such as asthmatics, children, and elderly. As shown in Fig. 4.3, all of the PM10 measurements collected at the 14 different industrial sand mine monitoring locations have been below the primary standard.

Results from these locations were also compared to data collected at Cataract Green, a green field planned to be developed as a mine in the future. There was no mining or agricultural activity at or around Cataract Green.

Short-term air quality measurements may not accurately represent natural variability in air quality, such as seasonal or weather-related changes and facility operations. Industrial sand operations such as blasting, excavation, processing, stockpiling, and loading for transport are a potential source of ambient particulate matter. However, PM10 monitors at 12 different facilities in western Wisconsin have not indicated an exceedance of the primary air quality standard, and this is supported by data collected by the WDNR since late 2010 (Fig. 4.3). The health-based PM10 standard of 150 µg/m3 is intended to protect even the most vulnerable populations. However, individual sensitivity to particulate matter levels and to particulate matter composition (type and size of particle) are variables that may factor into health effects resulting from exposure to particulate matter.

Nine of the counties did not indicate a statistically significant trend in asthma emergency department visits, and the five counties that did (Buffalo, Chippewa, Jackson, Pierce, Trempealeau) indicated both increases and decreases in asthma emergency department visits.

Evidence is very strong for the conclusion that industrial sand facilities are unlikely to substantially impact PM10 to the extent of exceeding air quality standards. The evidence is based on site-specific PM10 data collected using methods that meet federal standards. These data have been reviewed by air quality experts at WDNR and made publically available

Evidence is very strong for the conclusion that industrial sand facilities, as currently regulated in Wisconsin, are unlikely to substantially impact levels of respirable crystalline silica on a community level.

Briefly discuss why RCS levels at fracking sites may be higher, pneumatic transfer of sand sheering the sand grains.

Conclusion

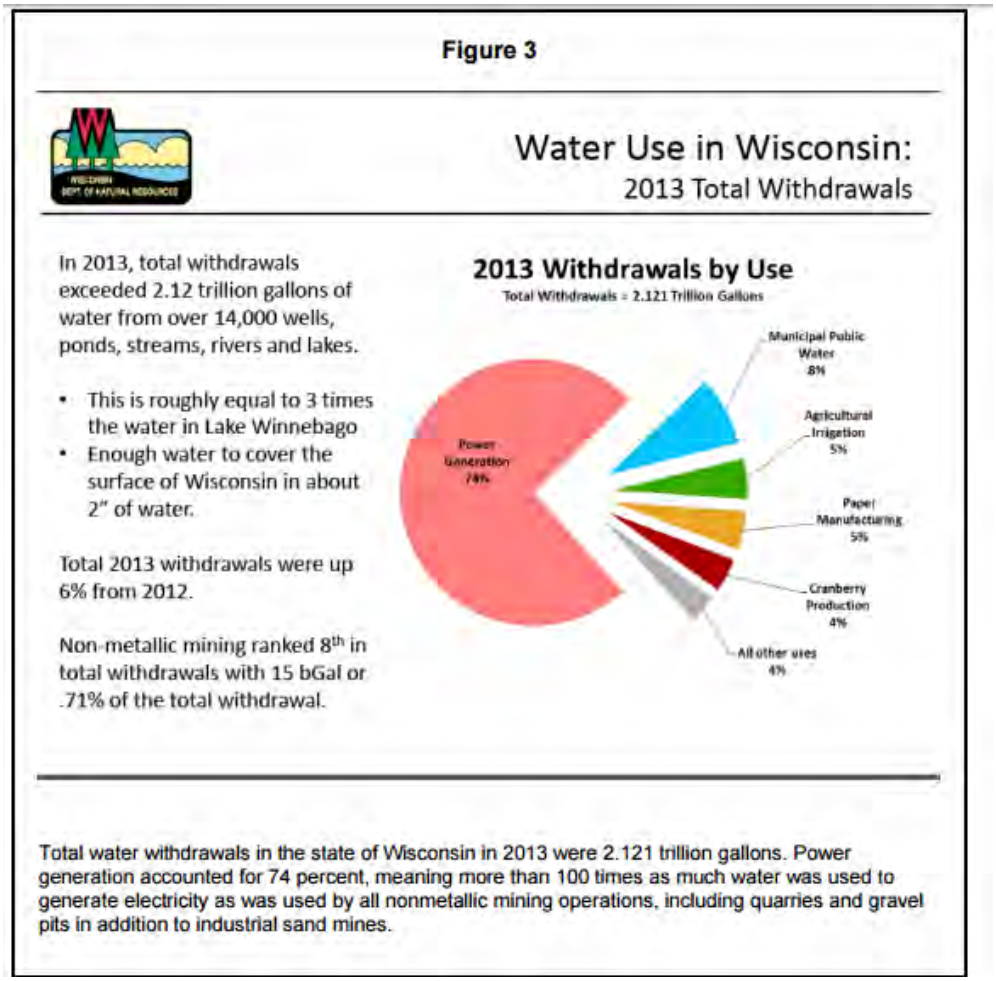
As industrial sand mining became more prevalent in Wisconsin and other states in the Upper Midwest in response to the demand for frac sand, so too did concerns about the potential impacts this industry could have on the environment and human health. An initial lack of information exacerbated these fears, and much misinformation still persists to be cited in the public debate.

This study examines the best-available scientific data, collected using proper equipment and sampling methodologies by state agencies and nationally-respected air monitoring scientists. These studies all show industrial sand facilities do not contribute hazardous levels of respirable crystalline silica or Particulate Matter pollution, and therefore do not pose a threat to human health or the environment.

Non-scientific studies which have used non-EPA approved equipment and methods have only served to create confusion regarding the actual impact of industrial sand facilities on the environment, and have served to make people anxious and fearful of the impact these facilities may have on their families, and their home values. These studies are unprofessional, and irresponsible.

Water Consumption

Use more pictures to accurately display how much water is consumed by ISM. DNR already has graphics showing water consumption by ISM compared to other industries (we use them in our reports) and pictures are much better at conveying information than dense text.



I believe showing graphics for withdrawals by use for 2014, in addition to the 2013 data would give the public a better context for understanding water use in the industrial sand mining sector.

Water consumption by industrial silica sand operations constituted just a fraction of the alreadysmall amount used by all nonmetallic mining operations. Water withdrawals associated with industrial sand activity were only 1.99 billion gallons in 2013, just 0.09 percent of the 2.121 trillion gallons consumed for all purposes in the state. (See Figure 4.) By comparison, agricultural irrigation accounted for 5 percent of total water withdrawals, using 55 times more water than industrial sand operations for mining and processing.

I**ndustrial sand washing and processing was only the sixth-largest source of water use in the ten counties reporting presence of industrial-sand washing operations**. Pie charts showing the total water usage in these counties would be beneficial for the reader. I do not know where to get the data for this, but I'm sure DNR is capable of it and it would contribute greatly to the conversation about local water use.

Except for relatively small amounts of water that evaporate during sand mining and processing, essentially all the groundwater pumped from the aquifer is retained in the geographic basin that

comprises the surface water–groundwater aquifer system. For example, water discharged from a mine during dewatering (lowering the water table around an area to be mined) is kept within the basin, under a permit issued by WDNR. There is no material net loss of water from the surface water–groundwater system.

Economic Impact

Using more charts and graphs would be helpful for allowing readers to visualize the economic impact of industrial sand mining.

Industrial Sand Mining Diversifies Local Economies

Most counties with industrial sand mining rely more on agriculture as a source of economic activity than the state average. This makes them subject to fluctuations in the price of agricultural goods.

Figure 8

County	Total Jobs	Agriculture Jobs	Agriculture as a % of All Jobs
Barron County	28,781	8,231	28.6
Buffalo County	8,435	3,046	36.1
Burnett County	6,820	848	12.4
Chippewa County	31,660	4,388	13.9
Clark County	16,905	7,696	45.5
Columbia County	29,006	4,528	15.6
Crawford County	10,460	1,488	14.2
Dunn County	21,245	3,881	18.3
Eau Claire County	70,107	4,481	6.4
Green Lake County	9,769	1,463	15.0
Jackson County	11,513	2,543	22.1
Monroe County	24,727	4,281	17.3
Outagamie County	124,258	11,593	9.3
Pepin County	3,266	1,035	31.7
Pierce County	14,369	2,378	16.6
Polk County	20,122	3,693	18.4
Portage County	43,167	5,551	12.9
Trempealeau County	16,829	4,778	28.4
Waupaca County	25,734	4,427	17.2
Wood County	50,781	4,616	9.1
Total	**567,954**	**84,945**	**19.4**

Data compiled from the University of Wisconsin-Extension *County Impact Reports* demonstrate silica sand-producing counties rely heavily on agriculture as a source of employment. Several frac sand counties depend on agriculture for more than 20 percent of the jobs in the county. Clark County relies on agriculture for 46 percent of the jobs in the county, suggesting this area lacks economic diversity.

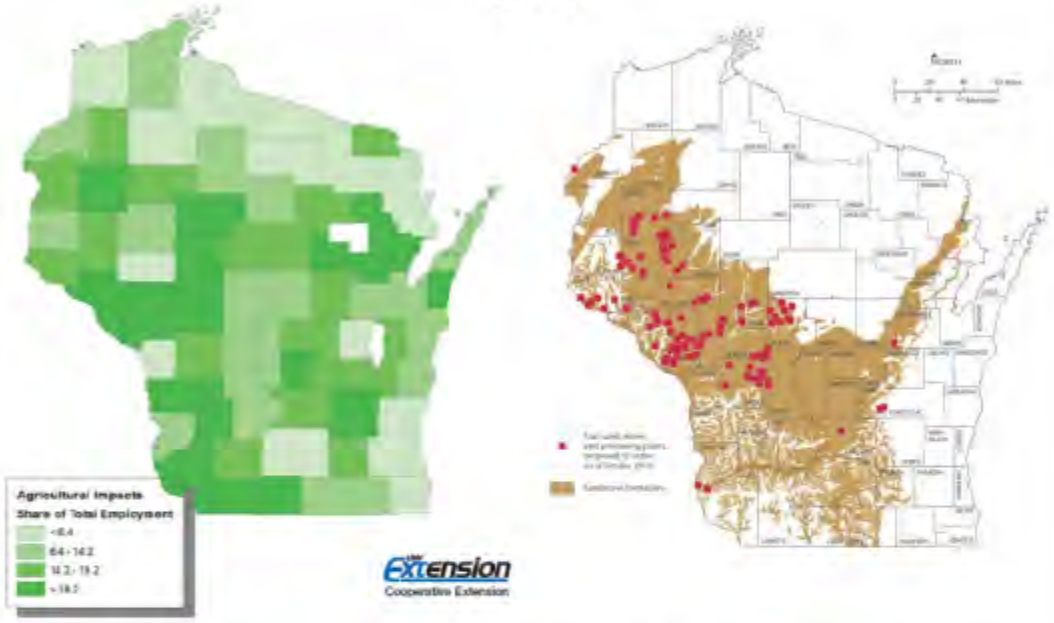
Wisconsin relies heavily on agriculture as a source of employment, with this sector accounting for 11.9 percent of all jobs in the state.[19]

Rural communities in western Wisconsin are even more dependent on agriculture as a source of employment than the statewide average: Six sand-producing counties (Barron, Buffalo, Clark, Jackson, Pepin, and Trempealeau) derive more than 20 percent of their total employment from this sector, and Clark County relies on agriculture for 46 percent of the total jobs in the county. (See Figure 8.)

Of the 20 sand-producing counties, in only three (Eau Claire, Outagamie, and Wood) does agriculture represent less than the statewide average of 11.9 percent of all jobs.[20]

These figures confirm agriculture is and will continue to be an important part of the Wisconsin

Figure 9



Many counties with significant levels of frac sand development are also the most heavily reliant on agriculture as a source of employment. Red squares in the right panel indicate sand mining operations, and counties colored dark green in the left panel derive more than 19.2 percent of their total employment from the agricultural sector, suggesting frac sand mining will have a diversifying effect on these counties.

Sources: (left) Steven Deller and David Williams, *The Economic Impacts of Agriculture in Wisconsin Counties*, UW-Extension Cooperative Extension, March 2011, p. 22; (right) Wisconsin Network for Peace and Justice, http://www.wnpj.org/sites/default/files/u4/wgnhs_oct13.jpg

A similar table was included in the draft version of the DNR's Strategic Analysis, however it only showed the difference between two years. The table below relies on WI Dept. of Tourism data and shows the difference in tourism from 2010-2014, when growth in ISM was fastest.

Figure 11

Tourism Impacts

Wisconsin and Silica Sand Producing Counties - Alphabetical

	Direct Visitor Spending			Total Employment Direct, Indirect, Induced			Total Labor Income			State and Local Taxes			Per Capita Income			Tourism Jobs		
	Millions		%	Total		%	Millions		%	Millions		%	Dollars		%	Jobs		% of Total Jobs
County	2010	2014	Change	2010	2014	Change	2011	2014	Change	2010	2014	Change	2011	2014	Change	County*	Tourism 2014	
Wisconsin	$9,197.3	$11,419.1	19.46%	180,608	187,643	3.7%	4,292.2	$4,829.9	11.13%	$1,202.1	$1,417.3	14.89%	$23,765.54	$25,739.51	8.31%	2,752,732	187,643	6.82%
Barron County	$76.9	$94.7	18.82%	1,377	1,407	2.2%	$26.6	$30.4	12.34%	$9.2	$10.7	14.00%	$19,343.01	$21,590.90	11.62%	28,781	1,407	4.89%
Buffalo County	$8.5	$10.8	21.19%	173	189	8.5%	$3.3	$3.7	11.33%	$1.1	$1.3	16.89%	$19,179.61	$19,781.87	3.14%	8,455	189	2.24%
Burnett County	$21.9	$22.4	2.42%	422	366	-15.4%	$6.6	$6.6	0.25%	$2.9	$2.9	-0.09%	$15,568.11	$18,017.74	15.73%	6,820	366	5.37%
Chippewa County	$66.2	$77.6	14.72%	1,296	1,313	1.4%	$26.2	$29.3	10.70%	$8.2	$8.9	8.16%	$20,217.79	$22,331.60	10.46%	31,660	1,313	4.15%
Clark County	$22.1	$27.1	18.68%	354	356	0.7%	$6.1	$6.5	6.37%	$2.5	$2.9	13.57%	$17,296.99	$18,343.88	6.05%	16,905	356	2.11%
Columbia County	$88.3	$115.4	23.50%	1,585	1,700	6.7%	$29.8	$33.9	11.85%	$11.9	$13.6	12.43%	$18,821.38	$19,909.92	5.78%	29,006	1,700	5.86%
Crawford County	$33.0	$41.2	19.91%	681	714	4.6%	$11.7	$11.7	0.11%	$4.9	$5.5	10.71%	$17,160.71	$16,395.20	-4.46%	10,460	714	6.82%
Dunn County	$36.5	$46.4	21.21%	809	864	6.4%	$14.9	$17.2	13.51%	$5.0	$6.0	16.26%	$18,382.81	$19,891.35	8.21%	21,245	864	4.07%
Eau Claire County	$166.8	$214.8	22.34%	3,879	4,055	4.3%	$81.2	$90.9	10.60%	$23.2	$27.1	14.41%	$20,938.39	$22,404.07	7.00%	70,107	4,055	5.78%
Green Lake County	$28.9	$35.3	18.13%	687	763	9.9%	$12.0	$15.3	21.38%	$4.6	$5.4	15.94%	$17,500.73	$20,047.03	14.55%	9,769	763	7.81%
Jackson County*	$30.7	$36.1	14.74%	556	545	-2.1%	$8.9	$9.2	3.13%	$4.2	$4.5	5.77%	$15,951.99	$16,819.35	5.44%	11,513	545	4.73%
Monroe County	$58.7	$79.6	26.28%	1,055	1,203	12.3%	$19.7	$24.6	19.92%	$8.1	$9.8	17.68%	$18,704.63	$20,492.62	9.56%	24,727	1,203	4.86%
Outagamie County	$260.1	$315.8	17.62%	6,217	6,287	1.1%	$137.3	$154.0	10.84%	$36.5	$40.7	10.45%	$22,080.56	$24,486.69	10.90%	124,258	6,287	5.06%
Pepin County	$4.5	$5.7	20.54%	97	101	4.5%	$1.7	$1.8	6.64%	$0.6	$0.7	14.72%	$17,755.83	$18,167.35	2.32%	3,266	101	3.10%
Pierce County	$21.8	$25.0	12.96%	406	416	2.2%	$7.6	$8.2	7.10%	$2.7	$3.0	10.10%	$18,730.88	$19,715.38	5.26%	14,309	416	2.89%
Polk County	$70.1	$79.5	11.76%	1,070	1,061	-0.9%	$19.7	$20.3	3.24%	$7.5	$8.5	11.95%	$18,380.44	$19,160.86	4.25%	20,122	1,061	5.27%
Portage County	$92.5	$111.6	17.12%	2,074	2,073	-0.1%	$40.5	$42.4	4.36%	$13.2	$14.7	10.16%	$19,551.21	$20,453.51	4.62%	43,167	2,073	4.80%
Trempealeau County	$20.8	$24.2	14.12%	389	371	-5.0%	$7.0	$7.3	3.63%	$2.5	$2.8	9.12%	$17,981.79	$19,587.40	8.93%	16,829	371	2.20%
Waupaca County	$71.2	$87.4	18.47%	1,274	1,503	2.2%	$21.4	$23.9	10.23%	$9.2	$10.5	12.34%	$16,810.33	$18,305.76	8.90%	25,734	1,303	5.06%
Wood County	$75.2	$86.6	15.21%	2,158	2,166	0.4%	$50.5	$57.3	12.22%	$10.2	$11.1	7.56%	$23,320.85	$26,463.90	13.48%	50,781	2,166	4.27%

Data from the Wisconsin Department of Tourism show the majority of sand-producing counties experienced growth in all major tourism metrics between 2010 and 2014.

Notes

*Jackson County data were not available for 2010, so 2011 data were used.

* Total labor income data were not available for 2010, so 2011 data were used.

* County job estimates derived from University of Wisconsin Extension, *County Impact Reports*, http://www.uwex.edu/ces/ag/wisag/. Statewide job data from Bureau of Labor Statistics, "County Employment and Wages in Wisconsin–Third Quarter 2013," April 16, 2014, http://www.bls.gov/regions/midwest/news-release/countyemploymentandwages_wisconsin.htm.

* Per-capita income was calculated from 2011 total employment data because total labor income data were not available for the year 2010.

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22 August 2016

WRITTEN COMMENTS ON THE "Wisconsin Department of Natural Resources Industrial Sand Mining in Wisconsin Strategic Analysis for Public Review"
22 August 2016

Dear ISM SA Coordinator:

With this letter, I would like to provide written comments on the ISM SA draft document dated July 2016. I write as a Professor and Program Director of Environmental Public Health at the University of Wisconsin-Eau Claire, as a technical advisor and subject matter expert for the National Environmental Health Association, as the author of 16 peer-reviewed publications, and as a Fulbright Scholar and reviewer. My laboratory group has been measuring airborne particulate levels around frac sand mines and processing plants in Wisconsin over the last seven years. During this period we have given 13 presentations at scientific research conferences, 19 presentations to local communities and have published the lead article on our research in the Journal of Environmental Health.

Comments are organized in two groups: Responses to Specific Statements within the Draft Document and Recommendations for Inclusion of Additional Information.

Responses to Specific Statements

P. ii "There is not currently a federal standard or federally approved monitoring method for crystalline silica." **NIOSH method 7500 is a federally approved method for monitoring silica in the workplace and is used for environmental monitoring (see Richards and Brozell paper cited in draft document).**

P. ii-iii "Industrial sand mining facilities that are required to monitor for particulate (under ch. NR 415, Wis. Adm. Code, pertaining to industrial sand mines and ledge rock quarries), typically monitor for PM10 (particulate matter less than 10 microns in size) because the particulate from industrial sand mines is primarily composed of larger size fractions." **Either data supporting this contention should be referenced or this statement should be removed.**

P. iii "Particulate matter less than 2.5 microns (PM2.5) is a particulate size derived from combustion activities or chemical reactions between precursor pollutants like nitrates and sulfates, and not from processing or mining of sand." **Data supporting this contention should be referenced or the statement removed. In a letter dated August 26, 2015, EPA Air Permits**

Section Chief Gepevieve Damico wrote to the DNR's Kristin Hart "There have been numerous PM2.5 studies by EPA, academic institutions, and industry groups which demonstrate that emissions of PM2.5 from mechanical processes are not all zero." … "Overall, EPA does not believe that a broad statement that mechanical processes do not emit PM2.5 is accurate or appropriate." And "While some sources with mechanical processes or fugitive dust may have low or negligible emissions of PM2.5, this should be determined on a case-by-case basis."

References numbered 1–4 and 6–10 under "Recommendations for Inclusion" below support the generation and measurement of PM2.5 from frac sand mining and processing.

A video clip of documented particulate emissions from wind (mechanical generation) is available on this UW-Eau Claire server site:
https://kaltura.uwec.edu/media/Sand+Storm+June+10th+2016/1_jv502my3

It is especially important for the draft DNR document to carefully evaluate PM2.5 emissions given the unfortunate recent history of EPA denial of the Wisconsin DNR submission for PM2.5 management (§ 52.2592 Review of new sources and modifications. Disapproval).

P. iii "…existing monitoring data have not identified problematic air quality at sand mining and sand processing sites." **This statement should be qualified to note that no DNR data at frac sand facilities have been collected and that existing data are industry-supplied values for just 17% (16 of 92) facilities and only for PM10 – no PM2.5 data were collected.**

P. 2-21 "Federal and state ambient air quality standards exist for particulate matter and many commonly emitted hazardous air pollutants, but state standards do not explicitly exist for diesel exhaust or crystalline silica." **State standards for ambient crystalline silica exposure are in place for seven states as documented in the June 2011 Report to the Natural Resources Board: Silica Study." Since that publication, Minnesota has also adopted an ambient standard (http://www.health.state.mn.us/divs/eh/hazardous/topics/silica/silicaguidance.html).**

P. 2-22 "Monitoring of particulate matter is required at industrial sand mines and ledge rock quarries under s. NR 415.075." **It should be noted that WDNR has provided monitoring requirement waivers for all but 17% (16 of 92) facilities and only required PM10 – no PM2.5 monitoring was required.**

P. 2-23 "Sand mining and processing mainly involves mechanical processes that would be expected to generate particulate matter larger than PM2.5." **As with the comment on page iii above, unless data are provided supporting this contention, this statement should be modified or removed.**

P. 2-26 "When DNR inspectors have observed blasting activities at mine sites, inspectors have observed no significant fugitive dust emissions." A video clip of documented emissions from blasting is available on this UW-Eau Claire server site:
https://kaltura.uwec.edu/media/Blast+2016+June+8th/1_xpoho237

P. 2-27 "The federal air quality standard most relevant to ISM and processing is the PM10 standard." **As noted above, this contention is speculative and should be modified or removed without the support of data.**

P. 2-28 "Collected materials in the baghouse are disposed of at the mine site as fines or reject

material." **It should be noted that these particulates, as well as the approximately 30% of "waste sand" used in the reclamation process can be resuspended and thus affect local air quality.**

P. 2-29 "Since the bulk of emissions at mining operations are fugitive, these types of sources are almost always able to demonstrate that they emit less than the threshold for coverage under the Type A Registration Permit." **It should be noted that DNR does NOT generally include fugitive dust sources in AERMOD evaluation of permit compliance, despite the June 2015 DRAFT Wisconsin Air Dispersion Modeling Guidelines which state,"Fugitive (non-point source) Emissions. Emissions created within a structure that are not vented to a stack but are considered in aggregate in the permit should be included in the dispersion modeling analysis." And "Fugitive Dust. When fugitive dust emissions on the facility property are affected by the permit, those emissions should be included in the dispersion modeling analysis."**

P. 2-32 "The ambient air quality analysis most relevant to industrial sand mine operations is the assessment of particulate matter (PM10) impacts." **As noted above, either data support for this contention should be provide or the statement modified or removed.**

P. 2-36 "For the reasons described above, the industrial sand mine industry is not expected to have significant impacts on air quality." **As noted above, the DNR has not conducted independent measurements of PM10, PM2.5 or crystalline silica levels around frac sand operations, only 17% of facilities are being self-monitored by industry, and a substantial body of data (described below) has been excluded from the draft document. These caveats should be expressed or more appropriately, all sources of data should be included in the report.**

Recommendations for Inclusion of Additional Information

The draft document is incomplete as it does not consider important recent studies on air quality in and around frac sand and similar facilities. These studies were previously provided to DNR staff Kristin Hart, Gail Good, Jason Truetel and Roberta Walls, and will be briefly summarized:

1. Mine Safety and Health Administration measurements of respirable (PM_4) crystalline silica levels to which Wisconsin mine and processing plant workers are exposed (http://www.msha.gov/drs/drshome.htm).
2. National Institute for Occupational Safety and Health measurements of PM_4 crystalline silica levels to which hydraulic fracturing workers are exposed around the country (J Occup Environ Hyg. 2013;10(7):347-56. Occupational exposures to respirable crystalline silica during hydraulic fracturing. Esswein EJ1, Breitenstein M, Snawder J, Kiefer M, Sieber WK).
3. Pierce et al. measurements of $PM_{2.5}$ levels around frac sand plants in Wisconsin and Minnesota: (J Environ Health Nov 2015: 8–12 (2015) PM2.5 Airborne Particulates near Frac Sand Operations; Pierce, Crispin H., Kristin Walters, Jeron Jacobson, and Zachary Kroening).
4. Pierce et al. measurements of $PM_{2.5}$ and PM_{10} levels in Bloomer/Cook's Valley, WI from Oct. 2014 – July 2016. Reports sent to WDNR staff Gail Good and Jason Truetel on 18 December 2014, 4 March 2015, 8 June 2015, 29 December 2015, 19 February 2016 and 20 July 2016.
5. University of Iowa Ryan Grant Master's Thesis measuring $PM_{2.5}$ around frac sand plants (University of Iowa, http://ir.uiowa.edu/etd/1846), Community based air quality monitoring near proppant sand facilities, Ryan James Grant).

6. The US Environmental Protection Agency recognizes the following "top sources" of $PM_{2.5}$ in their consideration of criteria and hazardous air pollutants (http://www.epa.gov/ttn/chief/net/2008neiv3/2008_neiv3_tsd_draft.pdf, table 4):

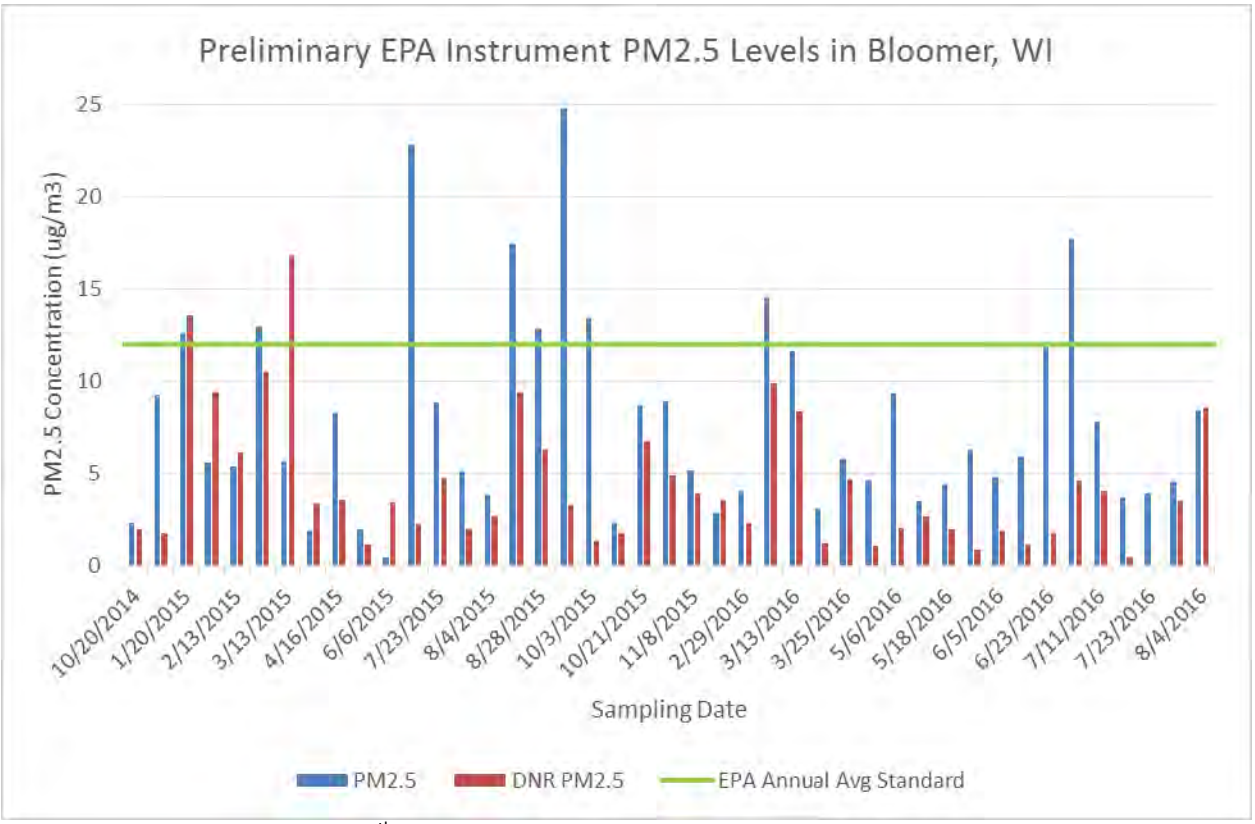
    a. …
    b. …
    c. Dust - Construction Dust
    d. Dust - Paved Road Dust
    e. Dust - Unpaved Road Dust
    f. Industrial Processes – Mining
7. The US EPA has established $PM_{2.5}$ emission factors for mechanical processes associated with coal mining (AP-42 section 11.9). Processes identified that generate $PM_{2.5}$ include blasting, truck loading, bulldozing, dragline, vehicle traffic, grading, active storage pile (table 11.9-1) and drilling, topsoil removal by scraper, overburden replacement, truck loading by power shovel, train loading, bottom dump truck unloading, end dump truck unloading, scraper unloading and wind erosion of exposed areas (table 11.9-4). They further state "All operations that involve movement of soil or coal, or exposure of erodible surfaces, generate some amount of fugitive dust." (http://www.epa.gov/ttn/chief/ap42/ch11/final/c11s09.pdf).
8. The Western Regional Air Particulates Fugitive Dust Handbook identifies the following sources of $PM_{2.5}$ and PM_{10} fugitive dust emissions http://www.wrapair.org/forums/dejf/fdh/content/FDHandbook_Rev_06.pdf):

    a. …
    b. Paved Roads
    c. Unpaved Roads
    d. Storage Pile Wind Erosion
    e. Mineral Products Industry
9. Madungwe and Mukonzvi found levels of 14.23–69.01 mg/m^3 $PM_{2.5}$ around a stone quarry (Atmospheric and Climate Sciences, 2012, 2, 52-59 Assessment of Distribution and Composition of Quarry Mine Dust: Case of Pomona Stone Quarries, Harare. Emaculate Madungwe and Tinashe Mukonzvi).
10. Jeffrey Johnson, an environmental engineering supervisor at the DNR … said there are "a couple of [frac sand plants] that would exceed the [federal] $PM_{2.5}$ standards." (Source: Inside Climate News, 5 Nov. 2013),

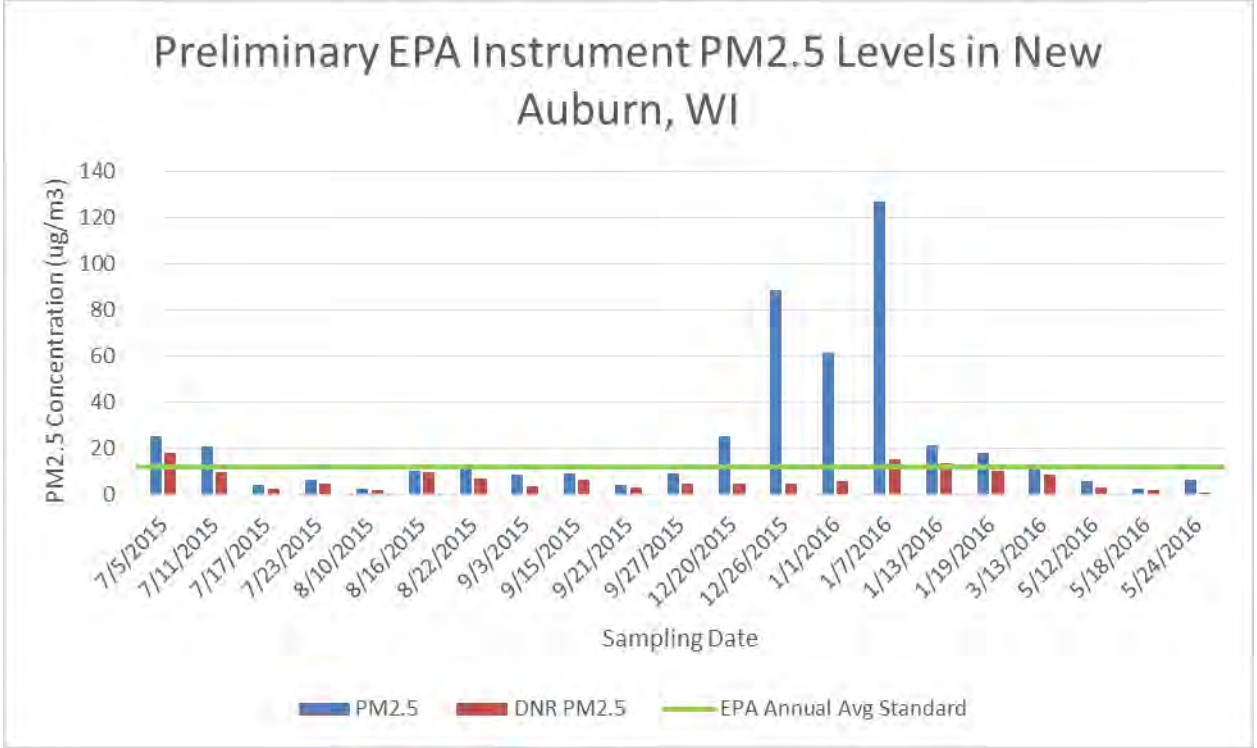
In addition, the Minnesota Pollution Control Agency (MPCA) has collected both PM4 and PM4 crystalline silica values in Winona, MN and published PM10 levels submitted by industry for frac sand facilities in their state (https://www.pca.state.mn.us/air/air-monitoring-minnesota-silica-sand-facilities).

Our laboratory is using EPA-certified federal reference method monitors to measure the levels of PM10 and PM2.5 particulate matter currently in Bloomer, New Auburn and Hixton, WI. The monitoring sites were chosen based upon EPA siting criteria, the Andersen or Thermo-Fisher dichotomous samplers were calibrated before and after each sample using a Tetracal calibrator, and pre- and post-weight filter weights were recorded on a Cahn 25 microbalance. Results from these 24-hour samples were compared to EPA standards, the State of California/World Health Organization PM10 standard, and the concurrent 24-hour averaged hourly PM2.5 values reported by the Eau Claire DNR regional monitor.

These as-yet unpublished data at Bloomer and New Auburn, WI are presented graphically below:



Average PM2.5 = 7.9 µg/m3, 98th Percentile = 23 µg/m3



Average PM2.5 = 23 µg/m3, 98th Percentile = 111 µg/m3

These data should be included in the draft strategic analysis document.

Sincerely,

Crispin H. Pierce, Ph.D.
Professor / Program Director
piercech@uwec.edu
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Willger, Christopher J - DNR

From: [redacted]
Sent: Tuesday, August 09, 2016 12:23 PM
To: DNR ISMSA
Subject: DNR's draft Industrial Sand Mining Strategic Analysis

ISM SA Coordinator, WDNR OB/7, P.O. Box 7921, Madison, WI 53707-7921

I am concerned that the DNR's draft *Industrial Sand Mining Strategic Analysis*:

- ***relies on industry-funded studies on air quality based on voluntary monitoring by frac sand operations,***
- ***dismisses potential impacts of fine particulate matter (PM2.5 emissions) based on insufficient data and faulty conclusions,***
- ***minimizes the risk of environmental harm to surface waters and wetlands from frac sand discharges, and***
- ***suggests there is limited impact to our agricultural land despite the large-scale losses to this valuable resource.***

However, the DNR did the right thing by acknowledging the threat of acid mine drainage from industrial sand facilities and supporting further study of the connection between mining and metals in our water.

Thank you.

- [redacted]

Racine, WI 53403

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August 22, 2016

Mr. Dave Siebert
Wisconsin Department of Natural Resources OB/7
P.O. Box 7921
Madison, WI 53707-7921

RE: **Industrial Sand Mining Strategic Analysis**

Dear Mr. Siebert:

As a member of the Wisconsin Industrial Sand Association (WISA), Badger Mining Corporation's comments, detailed below, mirror the comments submitted by WISA, with additional comments also provided. All comments by BMC in response to the draft Strategic Analysis for Industrial Sand Mining are as follows:

Executive Summary

On page ii, the document states that currently, 9% of all sand mines (or six mines specifically) are greater than 1,000 acres. Badger Mining's Taylor Sand Plant, the largest in the state according to the document, has less than 450 acres of open pit and land used for processing sand. The document inadvertently makes it appear that six sites within the state have more than 1,000 acres of exposed sandstone currently being mined. In reality, much of the land remains in agriculture or serves as buffer property.

Section 1.2.2 - Explanation of Hydraulic Fracturing

A detailed description of hydraulic fracturing is provided. Industrial silica sand is also used in many other industries such as metals casting, filtration, glassmaking, etc. Those industries should also be spotlighted, as they are important end-users of our products as well. Furthermore, by detailing only hydraulic fracturing, the document continues to makes it sound like Wisconsin sand used for hydraulic fracturing is somehow different than Wisconsin sand used for other industries. In reality, what separates these sands is processing specifications.

Section 1.2.3 - Location of Sand Resources

The sentence reads "sand resources that meet frac sand specifications is found in the Cambrian, Jordan, Wonewoc, and Mt. Simon Formations." The Cambrian is not a geologic unit; it is a geologic time period. All the units listed are Cambrian-aged sandstones. Therefore, we suggest, "sand resources that meet frac sand specifications are found in the Cambrian-*age* Jordan, Wonewoc, and Mt. Simon Formations."

Brown County is listed as a county with dolomite quarries. We are not aware of any dolomite quarries in Brown County; however, there are dolomite quarries in Waupaca and Outagamie Counties, which are not listed.

Section 1.2.4 – Current Operations

We feel some sites are not included in the list of reclaimed mines. For example, Badger Mining's St. Marie Sand Plant near Berlin, Wisconsin is a reclaimed sand facility, but is not on the map in the document.

Section 1.3.1 – Dry Mining

Under Blasting, we feel that it should be clarified that not every sand mining facility needs to blast as part of its operation.

Under Pumps and Washing, it reads "To the extent possible, water will be conserved and recycled by means of a settling pond." Not every facility has settling ponds; many utilize clarifiers as a means of recycling the water.

Section 1.3.6 – Transportation and Load-Out Facilities

"Most of the rail cars being used are open-topped…" We believe that the type of rail car has been misrepresented. Most rail cars being used by non-metallic mining operations are covered hopper cars. The car's top hatches are then closed during transport.

Under Conveyor Systems, it reads, "sand conveyed from the storage piles to further processing (transfer to dryers) is typically dry…." This narrative is misleading; stockpiled sand is considered to be "wet," as the sand sent to the dryer has a moisture content, and is sent to the dryers to be dried.

Section 2.1.1 – Particulate Matter (PM)

"Crystalline silica…is a component of particulate matter, it will be a portion of the particulate matter present in any particulate matter sample" Crystalline silica *can* be a component of particulate matter, but is not a component of *all* particulate matter.

Section 2.3.17 – Current Trends

We feel this section would benefit by providing some context regarding withdrawal amounts state-wide. What percentage of withdrawals in the state are from industrial sand facilities? This information was presented in the Institute for Wisconsin's Health, Inc. Health Impact Assessment on Industrial Sand Mining in Western Wisconsin.

Section 2.8.2 – Existing Forest Vegetation

"If mines are located in a forested area, because of the nature of ISM, the structure, composition, and function of this ecosystem will change permanently from the existing state." We feel it should be noted that once the site is reclaimed, the area can be returned back to a state (such as forested land) like the one that existed before the mine was constructed.

Section 2.8.3 – Short-Term Impacts

"ISM will have a pronounced impact on the visual aesthetics where they are established." Badger Mining Corporation's Taylor Sand Plant is surrounded by thousands of acres of forested land as a way to not impact the area visually.

Section 3.3.1 – Transportation Logistics

The sand industry is certainly moving in the direction of utilizing more unit trains to ship its products long distances. This move to unit trains should have several benefits, like streamlining the shipping process and reducing the pressure on the railroads that all industries encountered in the last several years.

General Comments

The best fact-based documents contain a plethora of citations. Badger Mining Corporation believes that the lack of scientific citations present in the Strategic Analysis is detrimental to the efforts of the document as a whole. We believe it would be in the Department's best interest to cite as many sources as possible that were used in crafting the document.

Thank you for the opportunity to provide comments on the draft of the Strategic Analysis on Industrial Sand Mining. Additionally, we would like to thank the WDNR for its ongoing effects to educate the general public about the non-metallic mining industry.

Sincerely,

Nick Bartol
Public Relations Associate
Badger Mining Corporation

Willger, Christopher J - DNR

From: [redacted]
Sent: Tuesday, July 26, 2016 3:55 PM
To: DNR ISMSA
Subject: draft strategic analysis of industrial frac sand mining

Greetings,

My name is Juliee de la Terre and I teach environmental science at Viterbo University. I have advocated for more stringent rules on frac sand mining for the last three years. I reside in southwestern Wisconsin near LaFarge.

My experience has been garnered from on site observations and interviews of people who live within a half mile of a frac sand mine, processing facility or loading area.

I have videotaped and witnessed considerable amounts of frac sand dust blowing from sand piles and loading facilities. At night the light from the processing facilities refracts off of the silica dust and the amount in the air is considerable. I have noticed changes in my breathing after visiting these areas. Of course, this is anecdotal on my part but I believe personal observation is valid.

Testimony from those who reside near frac sand mines includes interruption of their lives by noise, light, changes and or loss of well water, dangerous road conditions, social instability and uncertainty about continued quality of life. The industrialization of the rural landscape by the frac sand industry is not wise on many fronts. There is currently a glut of frac sand. The process of fracking is destructive to all areas where it takes place. Communities have been put at risk for the profit of the few. Corporation owners would never live next to a frac sand mine nor have an interest in the struggles of those whose property values have plummeted and health has deteriorated. As of today, though thousands of people have requested better oversight of this industry...no new significant regulations have emerged.

The DNR mission statement is to serve the people. If your agency has no desire to serve it's mission perhaps a new mission and title should be developed. The title could be the Department of No Regulations.

Sincerely,
Prof.Juliee de la Terre
[redacted]

ENVIRONMENTAL LAW & POLICY CENTER
Protecting the Midwest's Environment and Natural Heritage

August 22, 2016
Via Email

ISM SA Coordinator
WDNR OB/7
P.O. Box 7921
Madison, WI 53707-7921

To whom it may concern,

Please accept these comments on behalf of the Environmental Law and Policy Center regarding the Draft Industrial Sand Mining Strategic Analysis ("Draft Strategic Analysis") put forth by the Wisconsin Department of Natural Resources ("DNR") for public review pursuant to Chapter NR 150 of the Wisconsin Administrative Code. We appreciate the opportunity that the DNR has created for us to provide input on sand mining, an activity that creates serious consequences for humans and the environment. Notably, this mining heavily impacts the Driftless Area in Wisconsin, a premier biodiversity site that contains a high concentration of topographical and geological features. It is critical that the impacts of industrial sand mining on this area are minimized, in part by engaging in proper reclamation. We therefore request that the DNR make the two following revisions to this strategic analysis.

1. **Please clarify that operators are required to engage in contemporaneous reclamation.**

As you are aware, state regulations require operators to engage in contemporaneous reclamation "to minimize the area disturbed by nonmetallic mining and to provide for nonmetallic mining reclamation of portions of the nonmetallic mining site while nonmetallic mining continues on other portions of the nonmetallic mining site." Wis. Admin. Code NR § 135.06(2). The Draft Strategic Analysis, therefore, should be clarified to reflect this requirement. The first sentence of Section 2.10.3 of the draft currently states "Reclamation *may* occur contemporaneously with the development of new mining phases, especially in large surface mining projects, *or* upon the cessation of mining operations." Wisconsin Department of Natural Resources, *Industrial Sand Mining in Wisconsin: Strategic Analysis for Public Review* at 2-87 (June 2016) (emphasis added). The regulations, however, never specify that contemporaneous reclamation should only be conducted for large surface mining projects. Although a later portion

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of the reclamation section in the Draft Strategic Analysis does state that contemporaneous reclamation is "required," *id.*, the first sentence of Section 2.10.3 makes this requirement ambiguous. Consistent with Wisconsin regulations, we propose changing the first sentence of Section 2.10.3 to simply state "Reclamation must occur contemporaneously and upon the cessation of mining operations."

2. **Please address the impacts that inactive, unreclaimed sites and portions of sites have on humans and the environment.**

Although the Draft Strategic Analysis does address the impacts of sand mining, it should also explain in Section 2.10, the section on reclamation, the impacts that inactive, unreclaimed sites and portions of sites have on humans and the environment. It is striking that as of December 2, 2015 only four out of 128 industrial sand mining facilities had either been reclaimed or were in the process of final reclamation. *Id*. at 1-5 – 1-6. In fact, state laws and regulations do not specify how long a site or a portion of a site can remain inactive before it has been reclaimed. We strongly believe that state and local laws should limit how long such areas can remain inactive before being reclaimed. However, in lieu of such requirements, DNR should effectively communicate in Section 2.10 of the Strategic Analysis the impacts associated with inactive, unreclaimed areas and how these impacts may compound over time. At a minimum, these discussed impacts should include the impacts on human health and safety, air quality, groundwater, surface water, wetlands, fish, aquatic species, endangered species, wildlife, forest resources, agriculture, and people's ability to enjoy and utilize any lands impacted by industrial sand mining. This discussion will emphasize for decision makers and the public the importance of reclaiming inactive sites.

Thank you again for this opportunity to submit comments on the Draft Strategic Analysis. We respectfully request that you revise this analysis to (1) clarify that operators must engage in contemporaneous reclamation and (2) address the impacts that inactive, unreclaimed sites or portions of sites have on humans and the environment. These revisions will help to reduce the amount of damage caused by industrial sand mining operations and will promote people's use and enjoyment of Wisconsin's unique and diverse lands that are affected by these operations. Thank you for your time and consideration.

Respectfully submitted,

Lindsay Dubin
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FairmountSantrol

August 22, 2016

Roberta Walls [Roberta.Walls@Wisconsin.gov]
Industrial Sand Sector Specialist
Wisconsin Department of Natural Resources
3550 Mormon Coulee Rd
La Crosse, WI 54601

ISM SA Coordinator [DNRISMSA@wisconsin.gov]
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P.O. Box 7921
Madison, WI 53707-7921

Re: Comments on the June 2016 Draft Strategic Analysis of Industrial Sand Mining

Dear Ms. Walls and ISM SA Coordinator:

Associates from Wisconsin Industrial Sand Company (WISC) and Fairmount Santrol (FMSA) have completed a review the June 2016 Draft Strategic Analysis of Industrial Sand Mining Report (Draft Report) produced by the Wisconsin Department of Natural Resources (WDNR). Within the balance of this correspondence, WISC and FMSA respectfully submits comments to the WDNR Draft Report.

General Comments

The document must receive additional evaluation and comment from a series of technical reviewers focused on refining every section to be stronger within the realm of a scientifically and technically defensible publication. Too few statements and conclusions elude to facts that are not referenced, and therefore, not substantiated. Thus, the Draft Report has sections with a feeling of hearsay and conjecture which is inappropriate for a technical document. Additionally, exhaustive references to other publications, scientific reports and technical documents, developed by WDNR and others, would help substantiate this work product and allow it to be appropriately finalized.

Executive Summary

Page ii

The initial paragraph(s) should include a brief description that Industrial Sand mining (ISM) is part of a larger non-metallic mining group. WDNR must clarify reasoning why ISM is being scrutinized separate from other non-metallic mining cohorts (such as Dimension Stone, Crushed and Broken Stone, Construction and Sand Gravel….) that must have similar stakeholder concerns.

The statement relating the number of industrial sand facilities (128 current with 92 are active) must include the date this statistic was determined.

Additional information is needed related to the acreages of ISM sites as well as a comparison to other non-metallic mining sites. This type of updated information would educate stakeholders to the totality of IS sites compared to cohort type sites in Wisconsin.

Page ii and iii
Consider revising air quality section to clearly indicate what air pollutants and size fraction, when applicable, are regulated.

Page iii
Clarification and technical justification must be added to the groundwater section to indicate why WDNR is convening a team of stakeholders to research groundwater at ISM sites while not looking into other types of non-metallic mining sites in the state.

Additional information within the wetland section is needed to both clarify regulatory programs (WDNR and Department of the Army, Corps of Engineers) as well as include the total area of all wetland impacts in Wisconsin since 2008. This additional information will assist stakeholders in understanding of this complex permit program.

Page iv
Consider revising the statement within the Local and State Economy section that "There is currently no reliable method to measure the secondary impacts for jobs surrounding the recent growth of the industry". An interview of qualified economist would likely result in a revised statement indicating that there are a variety of "models" to evaluate secondary job impacts from growth of an industry. Then WDNR could consider providing the results of various models related to this industry.

Under the Safety section, please verify that DSPS has jurisdiction over fuel storage tanks.

Section 1

Page 1-1
The last paragraph of this page implies products from ISMs in Wisconsin is only used in the fracking industry, when it has many other end users.

Page 1-2
A detailed description of other IS uses (metals casting, filtration, glassmaking…) is needed to further educate stakeholders.
Starting on this page, fracking is spelled different ways (fracking or fracing). Need to be consistent throughout the document to avoid confusion.

Page 1-3
Section 1.2.3, it reads "frac sand specifications is found in the Cambrian, Jordan, Wonewoc, and Mt. Simon Formations." It should read, "frac sand specifications is found in the Cambrian-**age**, Jordan, Womewoc, and Mt. Simon Formations."

Page 1-11
Under Pumps and Washing Section, it reads, "To the extent possible, water will be conserved and recycled by means of a settling pond." Not every facility has settling ponds. Many utilize clarifiers as a means of recycling water and the text must be revised to reflect this.

The Stockpiling Section there has an indication that "Sstockpiles containing fine-grained waste materials are prone to instability and runoff problems." This statement must be substantiated as well as clarified what is intended by use of the term "waste".

Page 1-12
Use of the term underwater under Section 1.3.2 is confusing. Thus please clarify this section to indicate that some mined materials are found within, and mined from, the local water table.

Page 1-17
Under Rail Systems, it reads, "Most of the rail cars being uses are open-topped…" In fact, most rail cars being used are covered hopper cars. The car's top hatches are closed during transportation so that sand is retained in the car during travel.

Environmental Topics

Page 2-21
Additional information related to mobile vs. fixed sources of diesel particulate emissions must be discussed to clarify emissions from these two different type of sources are regulated.

Page 2-23
There is an indication under the Silica Content of Particulate Matter Section that, "Crystalline silica is a component of particulate matter." Crystalline silica can be a component of particulate matter, but is not a component of all particulate (i.e. such as particulates from combustion sources, pollen…) matter. This should be clarified.

Pages 2-24 to 2-26
Please clarify the regulatory position for particulate material emitted from transfer points such as conveyors, elevators, loading spouts and chutes. Clarification is needed for stakeholders to understand if the use of this type of equipment results in point source or fugitive emissions.

Pages 2-27 to 2-28
The New Source Performance Standards section needs to include the potential use of wet scrubbers as emission controls for such processes as drying, screening, and use of storage bins.

Page 2-28
Please modify text at bottom of page to indicate that mining operations may include the utilization of electrical generators. Additionally, please update text to identify the size of stationary engines that are subject to NSPS and NESHAP requirements.

Page 2-34
Again, clarification is required to allow stakeholders to understand why WDNR is not looking into the remaining non-metallic mining industry for issues related to physical and chemical between generated waste and surface/groundwater resources.

Page 2-41
Section 2.3.7 appears to target the ISM industry with burdensome requirements that are not being required of the remaining non-metallic mining industry in Wisconsin. This initiative is poorly substantiated if the WDNR will not also evaluate the same potential situation at other non-metallic mining facilities.

Page 2-48
The Current Trends Section 2.3.17 should also provide context regarding water withdrawal amounts state-wide and show a percentage of withdrawals industrial sand facilities compared to the total. This information was presented in the Institute for Wisconsin's Health, Inc. Health Impact Assessment on Industrial Sand Mining in Western Wisconsin.

Pages 2-48 to 2-49
Much of the text appears to be speculative and draws an uninformed reader to the conclusion that industrial sand mining will result in appreciable cumulative impacts. If impacts such as those outlined in this text is evident from existing ISM facilities, then make an appropriate reference. If not, then strike this text.

Page 2-53
A reference to a pending study that the DNR is to begin in the summer of 2016 to research possible linkages to increased concentrations of dissolved metals in groundwater and sand sites. A statement is then made "Metals may originate in the cementing materials in the sandstone formations and may be liberated during processing. Process water holding ponds are of particular concern, as metals may be concentrated there in both solid and dissolved forms." These statements are unwarranted if the WDNR is not also looking into this issue with the rest of the non-metallic mining industry in Wisconsin.

Page 2-66
Section 2.6.1 indicates that most of the ISM industry is concentrated in the"Driftless area of the state". The WDNR should consider inserting a map into this section to assist the reviewer understanding where the "Driftless area" is located as well as a definition of the "Driftless area" in this section.

Page 2-68
The text indicates that "The long term impacts of ISM in close proximity to trout waters are unknown. Fisheries biologists who manage counties near mines have received various complaints about stream deposition, high turbidity and run-off events. The effects of these events are not always clear." This text may lead a reviewer to conclude a correlation between ISM and these impact. The text should be clarified.

Additionally, the text describes an event that happened at a site in September 2014. It states that "No impact was documented to the fish community at that time, though it is still possible that there will be long-term impacts." The text should be modified to list out viable long-term impacts. If viable long term impacts are not evident, then the text should state such.

Page 2-80

Under Short-Term Impacts, it reads, "ISM will have a pronounced impact on the visual aesthetics where they are established." We question the source for this information and the relevance of a subjective non-environmental impact being in this report. This and other subjective text, such as, "Visual quality and aesthetics of forested areas are the primary reasons people choose to recreate and live in these areas. They are attracted by the peace and quiet of the outdoors and forests create this level of quality for our lives." should be stricken from this report.

The last sentence in the Long-Term Effects section says that sand mining will take forest out of production, resulting in a reduction of long-term benefits that could be derived from forest resources as a commodity is an incomplete analysis. The WDNR should also indicate that the area will experience increased economic benefit from the presence of an industrial sand mining operation.

Additionally, the second sentence under the Regulation section says "… and no mining would not be allowed". Should either be "no mining would be allowed" or "mining would not be allowed".

Page 2-87

Consider using a different term than "contemporaneously" in this section. It may be easier for some reviewers to know that reclamation can occur "during the same period of time" rather than "contemporaneously".

Socioeconomic Topics

Page 3-88

With respect to Socioeconomic topics, would appear that the DNR lacks the technical aptitude to speak of such subjective and potentially emotional matters. Much of the information in the Socioeconomic section is not referenced. Perhaps it would be more efficient, for the WDNR to provide summaries of socioeconomic reports completed by others and attached those reports as addendums to the Strategic Analysis.

Page 3-91

The last sentence under section 3.1.6 it states "..a continuing low level threat also continues with railbanked trails being reestablished as rail service for the commodity shipments." It would appear that the term "threat" is incorrectly used because rail development is part of economic development with a positive effect.

Page 3-92

The beginning of section 3.2.1 states "These issues are outside the authority of the DNR, and are regulated by local units of government, and Wisconsin Department of Transportation." Thus, the WDNR should not comment topics outside defined regulatory authority or subject matter expertise.

Page 3-96
The text under the Delays to Emergency Vehicles section indicates that "Drivers are experiencing more frequent and longer delays at at-grade rail crossings." This statement must be substantiated or stricken.

Page 3-99
Section 3.3.1 of Transportation Logistics mentions shipping sand in unit trains as potentially negative. The sand industry is moving in the direction of utilizing more unit trains to ship products long distances. The move to unit trains has benefits such as streamlining the shipping process, reduced rail traffic congestion. This could potentially reduce the pressure on the railroads to service other industries.

Page 3-101
The end of section 3.4.2 indicates a source sited as "(personal conversation, Keith Foye, DATCP)". A follow-up written correspondence should occur so that a written record can be referenced and available for the document.

Page 3-103
The end of section 3.5 source is sited as "pers.comm." Thus the same concern as with the reference noted on Page 3-101.

Page 3-107
Section 3.9.1 indicates "Regulation of impacts due to light from nighttime operations is not under the DNR jurisdiction." Thus, reporting should not be done on items not regulated or under the expertise of the WDNR.

Page 3-108
Similar comment related to WDNR reporting on non-jurisdictional items found within section 3.9.2: "Regulation of impacts due to noise of operations is not under the DNR jurisdiction."

Regulatory Framework

Page 4-114
Section 4.1.9 states "There are other means a local unit of government may use to exert some conditions on an industrial sand mine, including…" This WDNR statement is dangerous because it implies that local units of government NEED to exert additional conditions on ISMs. Current regulations at the state and federal level already heavily regulate ISMs.

Pages 4-123 and 4-125
A summary of regulatory programs in other states (such as Minnesota Policy) is unneeded and unwarranted. If WDNR insist on this section, then summaries of the regulatory programs in

other neighboring states (Iowa, Illinois and Michigan) must also be provided. This is an issue again on page 5-125 under section 5.1 which states "Wisconsin could consider regulatory changes such as those in Minnesota." Wisconsin may want to consider regulatory changes to mimic those found in Illinois, Iowa or Michigan.

Alternatives and Non Regulatory Activities

Page 5-126
Please revise the paragraph earmarked for Fairmount Santrol as follows:
Fairmount Santrol's diverse mining plans include a surface mine and the operation of Wisconsin's only two underground mines. In addition to their commitment to the Wildlife Habitat Council programs and the standards set by the Saving Birds Thru Habitat organization, the underground mines also provide habitat for the four species of cave-dwelling bats found in Wisconsin. Fairmount has partnered with the DNR and other stakeholders (such as the United States Fish and Wildlife Service). to foster research and monitoring of the bats frequenting portions of the underground mines. The research work includes population dynamics and surveys to evaluate bats for the presence of "White Nose Syndrome." White Nose Syndrome is a fungal disease that threatens bat populations across the U.S. Fairmount Santrol has also been recognized as a Green Master through the Wisconsin Sustainable Business Council's program. They are engaged in habitat and stream restoration, and many community projects at their locations in Wisconsin.

I would like to thank you in advance for serious consideration of these comments and look forward to their incorporation into the Draft Report as it becomes finalized.

Should you have questions or require clarification on the comments and information provided above, please contact me at 715-235-0942.

Aaron Scott

Aaron.scott@fairmountsantrol.com

Regional Surface Mining Manager
Fairmount Santrol

Willger, Christopher J - DNR

From: [redacted]
Sent: Friday, July 08, 2016 6:37 PM
To: DNR ISMSA
Subject: frac mining

I fought hard against sand mining but it seems to be here to stay. What I cannot understand is why we are not taxing each load that leaves Wisconsin.
[redacted]

Willger, Christopher J - DNR

From: [redacted]
Sent: Monday, August 08, 2016 8:08 AM
To: DNR ISMSA
Subject: Frac Sand Mining Comment

The public is aware of the intentional lack of funding for an adequate number of inspectors for frac sand mines and the intentional lack of follow-up when there are violations of regulations that were meant to protect the quality of our air and water.

We are aware that DNR Secretary Cathy Stepp is concerned only with corporate profits and not at all concerned with protecting our natural resources and the citizens of this state.

Therefore, we are convinced that any public comments regarding the dangers of frac sand mining will be ignored by the administration. We do not blame the DNR employees. In fact, we're not sure how they can continue to go to work, knowing that all their education and knowledge is ignored and belittled.

Just wanted this in the public record.

[redacted]
Baraboo, WI

Willger, Christopher J - DNR

From: [redacted]
Sent: Wednesday, August 17, 2016 4:38 PM
To: DNR ISMSA
Subject: Frac sand mining

I will leave the technical arguments up to others. Suffice it to say that we need to protect the property rights and quality of life for all who live in the rural areas of Wisconsin, not just those who are willing to sell their land for a short term profit. Forcing people to live next to a mine or leaving the scarred landscape to view for all who pass does not do that.
Please preserve the best of Wisconsin for our children and grandchildren.

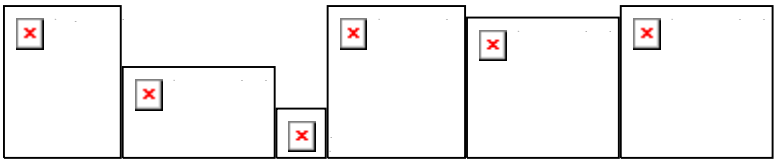
Regards,

[redacted]

Email: [redacted]

[redacted]

Madison, Wi 53711



Willger, Christopher J - DNR

From: [redacted]
Sent: Wednesday, July 20, 2016 11:52 AM
To: DNR ISMSA
Subject: Frac sand mining

Hello,

I'm writing, not as a person near a sand mine, but as a chronically ill individual living near the Chippewa and Eau Claire county line. I remain opposed to frac sand mining due to the health hazards of particulate matter. My illness precludes my reading the entire report, but I did see that there are many instances where an assumption is made without supporting evidence. For example, that the mines do not produce or emit fine particulate matter. If you are relying on sand mine operators to tell you about end points, the department is in for a huge discrepancy between fiction on the behalf of sand mine operators and independent, factual verification.

People in the effected counties need a deeper analysis, more data and more input from experts and the public in order to truly understand the impact of frac sand mining on public health and the environment.

--
[redacted]

"Each of us must work for his own improvement, and at the same time share a general responsibility for all humanity."
-- Marie Curie, Nobel Prize winner, physicist and chemist

Sierra Club - John Muir Chapter
754 Williamson St., Madison, Wisconsin 53703-3546
Telephone: (608) 256-0565
E-mail: john muir.chapter@sierraclub.org Website: sierraclub.org/Wisconsin

John Muir Chapter

August 22, 2016

ISM SA Coordinator,
WDNR OB/7, P.O. Box 7921,
Madison, WI 53707-7921

RE: Comments on Industrial Sand Mining Strategic Analysis

On behalf of the Sierra Club's John Muir Chapter I would like to thank you for the opportunity to provide comments on the Wisconsin Department of Natural Resources' (DNR) Industrial Sand Mining Strategic Analysis. The John Muir Chapter represents over 15,000 members living throughout the state. We work to provide opportunities for Wisconsinites to enjoy nature and advocate for the fair and rational management of our common resources so that all Wisconsin residents have access to the clean air, water, land, flora and fauna they need for their health, safety and well-being as well as to move our economy forward .

The purpose of the strategic analysis is to provide information on environmental impacts as well as the health and economic impacts for those making decisions about frac-sand mining permits, like Town Boards, County Boards, and the state DNR. It is also meant to identify best practices and various needs for further information. Wisconsin went from having a handful of small frac-sand operations to over 100. Given the scale of this activity and the potential negative health, economic and environmental impacts it is critical for local communities to have sound information so they can protect themselves appropriately. Unfortunately, in its current form it does not provide sufficient information to serve this purpose.

The presentation of the information in this analysis is disturbing because it glosses over the health risks by consistently downplaying the possibility of potential harm. In almost all cases where there is uncertainty the report assumes the best possible case instead of taking a protective precautionary approach. The analysis is a first step in providing information to communities about the impacts of frac-sand mining but it is significantly flawed. The following three examples are unfortunately indicative of a consistent bias in the analysis in favor of the frac-sand industry.

1. **Fine particulate matter:** the analysis of impact of frac-sand mining on ambient fine particulate matter (PM2.5) is woefully incomplete. PM2.5 is the term for air pollution with particles small enough to, among other things, damages the lungs. This can cause health concerns, including respiratory and cardiovascular concerns.

   Dr. Crispin Pierce of UW-Eau Claire measured the levels of particulate matter near frac-sand mines (http://www.wpr.org/study-air-near-frac-sand-mines-has-more-harmful-particles). His study found that particulate matter pollution near frac-sand mining operations was higher than

areas not near a frac-sand mine. He also found that the pollution levels were higher than the Environmental Protection Agency (EPA)'s standard. However, in Section 2.1.7 the DNR's analysis uses a lack of information to conclude that frac-sand mining is ***not likely*** to lead to increases in PM2.5. This is not the level of protection Wisconsin residents deserve or expect. The DNR should do more to study fine particulate matter to fully understand the impact frac-sand mining has on air pollution. The DNR should not permit any additional frac-sand mining proposals until this has been further studied.

2. **Water pollution:** The strategic analysis did recognize the potential for water pollution from frac-sand mining and processing but again glosses them over by statements like in Section 2.3.7 which indicates that frac-sand mining "may be linked to increased concentrations of dissolved metals in groundwater." And Section 2.3.8 of the analysis similarly states that it is "unlikely" for polyacrylamides, a probable human carcinogen, will be found in groundwater due to frac-sand mining. More studies needs to be done about the impacts on groundwater and nearby waterways, including wetlands, lakes, and rivers. The DNR should build on what is in the analysis and further study the impacts of frac-sand mining on groundwater. In the meantime, the DNR should not permit frac-sand mines unless it can ensure there will be no groundwater contamination.
3. **Community Impacts:** The study downplayed some of the socioeconomic impacts as well. The report states that "The value of nearby residential properties *may go down* due to the close proximity of mines."(emphasis added, Section 3.5 Property Values, Page 3-102) This section goes on to say, " Property values on adjacent residential parcels may decrease due to proximity to mine operation and associated concerns about noise, traffic, air quality, surface water and groundwater quality, viewscape, etc." But then somehow concludes that "On a large scale there may be little or no change in the tax base…" (Section 3.5 Property Values, Page 3-102) There is ample evidence to show that nearby residential values do go down. For many small municipalities residential properties are a large part of their tax base therefore a reduction in these values could have a serious impact on municipal revenue and hence the critical services they provide to their residents.

The Strategic Analysis relies too much on studies based on voluntary monitoring and industry-funded studies at industrial sand facilities. The result is that the analysis in almost all instances of ambiguity or insufficient information resolves them in favor of frac-sand mining. This undermines the utility of the document as the basis for local governments and the DNR decisions going forward regarding frac-sand mining activities. Given that every critical area where there is uncertainty is resolved in favor of the frac -sand industry it is clear that Independent studies are needed.

The study makes one thing clear: we still don't know enough about frac-sand mining. The DNR needs to continue studying the impacts, especially on air pollution, and should hold off on issuing any new permits until we have conclusive data.

Thank you for considering our comments.

Sincerely,

Bill Davis
Chapter Director
Sierra Club – John Muir Chapter

Willger, Christopher J - DNR

From: [redacted]
Sent: Monday, July 25, 2016 8:41 PM
To: DNR ISMSA; [redacted]
Subject: Frac Sand Strategic Analysis Hearing

Hello,

I am [redacted], a resident of the Augusta, WI, area. I live about two miles from the Five Star Sand Mine that is currently not in business and about seven miles from the Hi-Crush Sand Mine just east of the city of Augusta. This email is to describe my objections to sand mining in general and to the poor quality of data collection regarding sand mining regulation.

For ten years I worked as an assistant professor of graduate education for UW-LaCrosse and later UW-River Falls. During that time I supervised the masters thesis projects of over 400 graduate education students. On that basis, I believe I have good credentials to talk about research.

My first concern is leveled at the lack of data concerning the PM2.5 emissions. Apparently, the DNR has concluded that there are no emissions even though they do not have conclusive data to demonstrate that. In the field of research and data collection, polite scientists call such an unfounded conclusion "a guess." Scientists who are more frank call that "a fib." I agree, and this fib is central to the foundational decisions DNR uses to approve sand mining. It is time to tell the truth and stop fibbing!

My second concern is founded upon personal experience because unlike Madison politicians and state DNR officials, I live next to real sand mines.

In the field of research, you should know there is a second type of data, which I do not see given serious consideration. Along with what our literature calls "quantitative date" that provides hard numbers, there is an equally persuasive type of information called "qualitative data." This is information gathered from personal testimony, from ratings scales, from witness observation. And in all the years that I have lived with sand mines, I have never seen any public official pay due respect to such qualitative data, even though such information in the larger scientific field is valued at least as valuable if not more so by professional researchers.

This is the tragedy of the lack of regulating sand mines. Literally everyone I have ever listened to describe what it is like to live near a sand mine with the blowing sand, the constant heavy traffic, the disruption of the dynamiting, and the illegal well drilling is in the end, ignored. Shame on the DNR! Shame on the legislators! Shame on the governor! Here is a chance to actually practice good science or to just go through the same tired process of pretending to gather evidence and then allow selfish politicians and weary DNR officials to rubber stamp more sand mining.

[redacted]
Augusta, WI 54722

Willger, Christopher J - DNR

From: [redacted]
Sent: Sunday, August 21, 2016 11:26 AM
To: DNR ISMSA
Subject: Frac-sand Mining Impacts

To all those in decision-making positions,

It has come to my attention that the DNR is accepting comments from the public at large regarding frac-sand mining; and, as a concerned Wisconsin citizen, I'd like both to express my concerns and urge the DNR to refrain from issuing new permits until there has been more time to study the ramifications of these mines. Our singular, irreplaceable natural resources are at stake after all, and, therefore, so are all the lives who depend upon them.

It is no secret that there has been quite a frac-sand mining boom in the state, and the concerns are manifold in terms of environmental impact: from destruction of land and water contamination to dust/fine particulate matter and air pollution. Obviously, these are serious issues with regard to the health of humans and all other beings relying on these basic requirements for life. Moreover, however, the aforementioned effects branch out in a myriad of social and economic ways as well: from road conditions and farmland safety to ecosystem

integrity and wildlife observation/tourism--one of the mainstays of our beautiful state's economy. One thing is perfectly clear: frac-sand mining (unfortunately) cannot be conducted in a vacuum. Until it can be, or at least until its effects aren't quite so muddied, I propose that we do everything possible to slow this practice to a crawl until we truly understand how it is changing life.

The DNR should not permit any additional frac-sand mining proposals until this has been further studied, as we simply don't know enough about the effects of frac-sand mining at this point. I urge the DNR please to continue studying the impacts, especially on air/land/water pollution, and, again, hold off on issuing any new permits until we have conclusive, *independent* data.

Thank you sincerely for your time and attention to this matter and for all you can do to make our state (thereby, the world!) a safer, healthier place for all beings to live.

Best Regards,

[redacted]

Hayward, WI

[redacted]

[redacted]

Willger, Christopher J - DNR

From: Dick, James F - DNR
Sent: Tuesday, July 12, 2016 7:33 AM
To: Walls, Roberta A - DNR
Subject: FW: DNRs finding and mine pollution

Roberta,

This looks like something that should be part of the public comment file.

From: [redacted]
Sent: Tuesday, July 12, 2016 5:56 AM
To: Dick, James F - DNR
Subject: DNRs finding and mine pollution

I believe the DNRs findings fall short. The DNR needs to look at unbiased reports and take a tougher look at sand mining. Solicit the views of those who both do and do not live near mines. Frac sand mining destroys habitat. It supports fracking, which is a horrible addition to climate change and pollutes our water. Thanks much.

Willger, Christopher J - DNR

From: Willger, Christopher J - DNR
Sent: Monday, August 01, 2016 10:09 AM
To: DNR ISMSA
Subject: FW: Industrial Sand Mining Strategic Analysis Public Hearing

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Chris Willger
Phone: (715) 839-1609
christopherj.willger@wisconsin.gov

From: [redacted]
Sent: Monday, August 01, 2016 9:52 AM
To: Willger, Christopher J - DNR
Subject: Re: Industrial Sand Mining Strategic Analysis Public Hearing

Couldn't attend the meeting but I am very concerned about air quality around sand mines. We are looking at 24/7 dust being raised by the mining process and not just occasionally. The fine dust particles are extremely upsetting and many young adults and children are breathing in this dust. The PM needs to be smaller particles than are now allowed. Sand mine companies said they have been mining for 100 years but not with the high tech equipment and quantities they now use. Remember, asbestos was thought to be safe at one time also!
[redacted]

From: "Christopher J Willger - DNR" <ChristopherJ.Willger@wisconsin.gov>
Sent: Tuesday, July 26, 2016 1:51:18 PM
Subject: Industrial Sand Mining Strategic Analysis Public Hearing

If you plan to attend the hearing tonight, please see the attached map of the facility and parking areas. Please use lots P1 and P3 for parking, no permits will be required. If you arrive after 5pm, the staff lot (P9), will also be available for your use.

Thank you,

We are committed to service excellence.
Visit our survey at http://dnr.wi.gov/customersurvey to evaluate how I did.

Chris Willger
Environmental Analysis and Review Specialist – Environmental Analysis and Sustainability
Wisconsin Department of Natural Resources
1300 W. Clairemont Ave.
Eau Claire, WI 54701
Phone: (715) 839-1609
christopherj.willger@wisconsin.gov

UNIVERSITY OF WISCONSIN
PLATTEVILLE
SCHOOL OF AGRICULTURE

August 22, 2016

ISM SA Coordinator
WDNR OB/7
P.O. Box 7921
Madison, WI 53707-7921

Dear ISM SA Coordinator,

First off, I want to commend the Wisconsin Department of Natural Resources for creating the *Industrial Sand Mining in Wisconsin Strategic Analysis*. This document does a fine job of succinctly summarizing industrial sand mining in Wisconsin by explaining the regulatory framework and the environmental and socioeconomic impacts of the practice. I make this statement after having carefully read the document a number of times. I do have two specific comments and then three general comment about the document:

1. In Table 2.6 you have *Rhamnus cathartica* (Common buckthorn) listed twice. All scientific names should be italicized.

2. On page 3-98, the document states the "…ability to also return an adequate B soil horizon for root development)." For most Wisconsin crops, the majority of the roots are going to be in the A soil horizon, not the B soil horizon. It is common for mining professionals to consider the A and B (and occasionally C) soil horizons to be "topsoil" but from an agronomic or soil science perspective only the A horizon is topsoil.

3. I presented research on the state of industrial sand mining reclamation in Wisconsin with two student authors at the American Society of Mining and Reclamation 31st National Meeting. We analyzed all available reclamation plans in the state and focused on best practices. We found that the vast majority of reclamation plans for mines that had agriculture as a post-mine use failed to have metrics for crop yield. There was only one plan that included crop yield metrics as a reclamation success criterion. This is an egregious failure of reclamation planning in the state and needs to be corrected. The are many SMCRA states that have established guidelines for post-mine use crop yields that Wisconsin can follow or use to create our own guidelines. We also found that more than half of reclamation plans with "forests" as the post-mine use failed to include any information on species type, planting methods, or planting densities. Given these issues, I feel that in order to protect the industry from negative publicity, the state needs to do a better job of encouraging counties to create more robust reclamation plans. I feel that some of the county workers I've encountered lack general training on creating effective reclamation plans. Training and educational workshops for county workers are needed to improve the quality of plans. Finally, I would say that reclamation plans in Wisconsin are definitely adequate but they are not pushing the envelope, *e.g.*, by including more direct haul of topsoil and using geomorphic reclamation to better blend reclamation into the

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1 University Plaza | Platteville WI 53818-3099 | www.uwplatt.edu

surrounding landscape.

4. The document was not easy to find on the DNR website. I did not know that public comment was being sought. I only stumbled across the document when I was looking for other information on the DNR's website. I believe that a better effort should have been put into creating awareness about the draft comment period.

Finally, I want to thank the employees of the DNR for working with limited resources to keep industrial sand mining going in the state by giving out permits in a timely fashion while also working to keep the state safe by enforcing laws and regulations. It is difficult to balance both of these tasks and I feel that the DNR has managed quite well, especially given the rapid rise of industrial sand mining over the past 5 years.

Regards,

Yari Johnson
Assistant Professor & Program Director
Reclamation, Environment & Conservation
School of Agriculture
University of Wisconsin-Platteville

218 Pioneer Tower (608) 342-1323 FAX: (608) 342-1395
1 University Plaza · Platteville, WI 53818 · E-mail: compton@uwplatt.edu

Willger, Christopher J - DNR

From: [redacted]
Sent: Monday, August 22, 2016 12:16 PM
To: DNR ISMSA
Subject: June 20, 2016 WDNR Industrial Sand Mining Strategic Analysis

To: Wisconsin Department of Natural Resources

From: [redacted]

[redacted]

Elk Mound, WI 54739

Subject: June 20, 2016 WDNR Industrial Sand Mining Strategic Analysis

The following are a few of many concerns I have relating to the Strategic Analysis as presented in Eau Claire on July 26. The report fails to balance the Industry/Environment equation. The single hearing conducted in Eau Claire should have been repeated at various locations in the west central mining region and such additional local hearings must be conducted for reasonable citizen access after the draft is revised. Please enter the following comments into the official "public comments" and revise the Analysis so as to thoroughly consider and reflect upon them.

1) The title of the Analysis is inaccurate and misleading: The public demand for this study and its report initiated by citizens in 2014 related to the Fracking Sand Mining issue and its effects upon Wisconsin. As currently titled and as defined in the 5th paragraph of the "Forward" section, the use of Wisconsin's sand as a "fracking" material and an indispensable "oil and gas recovery" agent is relegated to the last seven words of that paragraph—almost as an afterthought to such uses as abrasives and filtration media. This literary mechanism belies and wrongly diminishes the real subject of this report: Frac sand and its inordinate boom, bust and environmental impacts on western Wisconsin. This study fails to properly balance the pros and cons of having this industry in our state.

2) The "Groundwater" section of the report's Executive Summary only peripherally mentions "possible linkages" to dissolved metals at the ISM settling ponds. The dissolved metals issue extends far beyond the possibility of leaching from holding ponds. Entire ridges, when denuded of the Tunnel City and other formations overlying the target Wonnewoc layer become likely leaching beds for heavy metals escaping their chemical bonds when excavated and exposed to the atmosphere. These leachates then have unimpeded, unfiltered direct access to the potable water aquafers lying under the Wonnewoc. No mention is made in the report of well documented concerns about such leachate contamination, concerns expressed repeatedly by scientists employed by the Department of Natural Resources. Almost no mention is made of a currently on-going study by Dr. Jay Zambito of the University of Wisconsin Extension which relates to sandstone bedrock core sample chemical analysis. No mention is made of a 2006 study report by Gotkowitz, etal, Contaminant Transport through Aquitards: Technical Guidance for Aquitard Assessment (Wisconsin Geological and Natural History Survey, The University of Waterloo, and the Marshfield Medical Research Foundation). This study specifically outlines potential problems with leachate components of the Tunnel City strata. Nearly all of Dunn

County and part of Chippewa County is served by ONE groundwater aquafer. Thus, local contaminant damage can easily become a region-wide potable water problem.

3) The "Surface Water" section of the Analysis totally ignores the destruction of aquitards within the Tunnel City formation which is unavoidable when strip mining the sandstone ridges. The potentially catastrophic consequences of such stripping stem from three basic problems: A) the lower levels of the Tunnel City formation contain extensive layers of glauconitic clay embedded within the sandstone grains. Included in these clay rich layers are various iron oxide encrusted, relatively impermeable black sandstone lenses. Together these strata form dense water retaining aquitards which help to slow the vertical percolation and improve the filtration into the underlying Wonnewoc and Eau Claire strata and they horizontally shunt a significant portion of the downward flow of water to springs and seeps on the ridge land hillsides near the base elevation of the Tunnel City formation. As any west central Wisconsin farmer knows, these springs and seeps exist all over the region. To date, no effort has been planned in sand mine reclamation proposals to rebuild such aquitard strata nor is it likely to be possible to effectively do that. B) When the aquitards referred to above are removed the seeps and springs are simply gone. Currently, west central Wisconsin is home to a complex and comprehensive system of cold water trout streams. The headwater rivulets and feeder streams for the entire system are at least partially and probably significantly fed their cold, clean, oxygenated trout sustaining water by this region-wide network of seeps and springs. The Strategic Analysis does not ONCE mention the words "seeps" or "springs." C) When the clay layers within the Tunnel City formation are stripped in a mining operation they are transformed from being highly beneficial assets into immense problems: When exposed to oxygen the metal compounds become chemically altered to produce leachates of various kinds which are known contaminants to surface and ground water supplies. The Clay itself is a problem: In storm water run-off it produces a colloidal suspension absolutely untenable for trout stream or animal drinking water. It remains suspended for weeks in high concentrations. The Analysis states that the maximum recorded sand mine related TSS reading is 199 mg/L. This conflicts with what we learned at a WDNR sponsored information meeting at the Chippewa County Howard Town Hall conducted by staff person Deb Dix on October 7, 2014. At that meeting it was revealed that the "Eighteen Mile Creek" spill from the nearby EOG/DS mine in the previous month resulted in TSS readings as high as 1200 mg/L. This class II trout stream was cream colored for weeks after the spill. Why was this information and this data omitted from the Analysis report? If this long-lived clay suspension somehow gets into the groundwater aquafers through denuded, very porous stripped sandstone strata, what will its effects be there? These concerns demand serious, scientific study.

4) In the "Wetlands" section of the Executive Summary of the Strategic Analysis no reference is made to the possible damage to or the damage already incurred in western Wisconsin wetlands by Frac Sand mining operations. Many hundreds of perched wetlands exist within the sand mining regions. While the Analysis appears to trivialize the 44 acres of wetlands so far destroyed, impaired or "mitigated" due to mining operations, nothing is said about the real damage already done by the numerous spill events. Neither is anything said or analyzed about the missing cold water from previously existing seeps and springs with respect to wetland feed water.

5) The "Borehole Abandonment" section of the Analysis contains one sentence informing that "DNR staff and citizens have reported unsealed boreholes. . ." This is a fleeting reference to a significant problem. No mention is made of a $26,000 fine levied by the Department of Justice against a Chippewa County mine prospector and his drilling contractor for failing to seal 28 boreholes on a proposed 1310 acre mine site. No mention is made of the citizens' extreme concern about those boreholes or the fact that semi-truck loads of liquid manure were later spread on fields within the violation site. No analysis is made regarding what the WDNR plans to do to prevent recurrences of these dangerous practices.

6) The "Permits and Enforcement" section of the Analysis reports that "since 2012 the DNR has pursued enforcement for 29 cases. . ." No discussion is presented regarding the disposition of those cases. Although the "Local and State Economy" section is replete with data about jobs created, high wages and equipment

investments, no mention is made about the nearly complete cessation of those positive indicators which has been the actual situation since mid-2015. No analysis is presented concerning real costs to Townships and Counties for on-going or future activities—including costs of reclamation for potentially abandoned mines. No data is presented regarding what the already incurred cost is to the State or any affected counties for administration of the 29 reported cases of purported prosecution. On balance, this report is mine industry apologetic regarding both regulation enforcement and economic costs or benefits.

Thank you for reviewing and considering these concerns. I expect the final report of the Strategic Analysis to reflect all of them far more thoroughly than the June, 2016 draft does.

Sincerely,

[redacted] PE, BSCE, MSCE,Farmer

August 22, 2016

Dave Siebert
Director of Bureau of Environmental
Analysis and Sustainability
P.O. Box 7921
Madison, WI 53707-7921

Dear Director Sierbert:

We appreciate the opportunity to submit comments on the draft Strategic Analysis of Industrial Sand Mining in Wisconsin ("the Strategic Analysis"). We thank staff of the Department of Natural Resources ("DNR") for their work preparing this draft.

Midwest Environmental Advocates ("MEA") is a nonprofit environmental law firm that works to ensure clean air, water, land, and government for this generation and the next. In response to overwhelming concern from area residents about the impacts of industrial sand mining, MEA developed a petition for a strategic analysis that was signed by over 1,000 residents. The support for this effort demonstrates public concern about this emerging and growing industry, and the need for effective and balanced government oversight.

Overall, the Strategic Analysis provides a more in-depth analysis of the costs and benefits of the industrial sand mining industry in Wisconsin than was previously available. Our comments address aspects of the Strategic Analysis that would benefit from further revision. We are especially concerned that the Strategic Analysis accurately and fully describes all potential costs and benefits based on available evidence. It is critical that this Strategic Analysis provide balanced information so that it remains a credible source of information for Wisconsin residents and decision-makers at every level of government.

A. Air Quality Section Presents an Incomplete Analysis of Potential Impacts.

Air quality impacts are of major concern to residents that live near industrial sand mines. Thus, this section of the Strategic Analysis is critically important. We are concerned that the air quality analysis in this Draft does not provide complete and unbiased information, and presents conclusions that are not supported by evidence and that are contradicted by information left out of the analysis.

1. *PM2.5 Emissions from Industrial Sand Mines*

Our main concern with the Air Quality section is that it ignores potential harm from PM2.5 emissions based on a faulty premise. The strategic analysis dismisses the issue with a few sentences without acknowledging contrary evidence or opinions.

The analysis of PM2.5 impacts begins with an explanation of the health impacts of this pollutant:

> Fine particulates, less than PM2.5 microns have been identified as being particularly important to public health because these particles can enter more deeply into the lung than larger particles. Evidence from epidemiology studies suggests that these sized particles are more likely to explain the association between particulate exposure and disease.[1]

But in the very next sentence, DNR makes an unqualified assertion that industrial sand mines do not emit PM2.5:

> While there are standards for PM2.5, particles in this size fraction are primarily attributed to combustion sources and secondary formation which travels regionally. Sand mining and processing mainly involves mechanical processes that would be expected to generate particulate matter larger than PM2.5.[2]

DNR does not cite to any authority for this assertion, and it is not widely accepted. U.S. Environmental Protection Agency ("EPA") as well as air engineers and environmental groups strongly disagree with DNR's position and with its new approach to regulating PM2.5 emissions. DNR made this policy change in a separate guidance document ("PM2.5 Guidance"), including a Technical Support Document ("TSD"), which explains the basis for DNR's conclusion that processes at industrial sand mines do not emit PM2.5.

In response to DNR's new PM2.5 policy, U.S. EPA and many others commented that the PM2.5 Guidance was not supported by scientific evidence.[3] Since DNR finalized the PM2.5 Guidance, EPA has also commented on draft air permits for which DNR did not estimate PM2.5 emissions, model those emissions for compliance with air standards, or include PM2.5 limits. In recent comments on a draft air permit for ani industrial sand mine, EPA rejected DNR's reliance on the TSD and PM2.5 Guidance:

> As WDNR's TSD relies upon an analysis of regional ambient air monitoring and provides little analysis of PM2.5 emissions at the source level, ***EPA does not believe that the TSD provides sufficient evidence to substantiate the claim that there are zero or negligible emissions of PM2.5 from mechanical sources.*** Similarly, while the study

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[1] Wisconsin Department of Natural Resources, Industrial Sand Mining in Wisconsin, Strategic Analysis for Public Review at 2-23 (June 2016) (hereinafter "Strategic Analysis"), *available at* http://dnr.wi.gov/topic/EIA/documents/ISMSA/ISMSA.pdf.

[2] *Id*.

[3] Attachment A (U.S. EPA, Letter to Kristin Hart, DNR, regarding draft PM2.5 Guidance (Aug. 26, 2015)) ("Overall, EPA does not believe that a broad statement that mechanical processes do not emit PM2.5 is accurate or appropriate.").

> cited by WDNR may indicate that activities associated with sand mining are unlikely to have significant effects on the ambient concentration of particulate matter of less than 4 micrometers, ***the study does not provide direct evidence that there are zero or negligible emissions of PM2.5.***[4]

In the Strategic Analysis, DNR does not acknowledge disagreement over its PM2.5 policy. The result is an incomplete analysis of potential air impacts and leaves the impression that the Air Quality section is biased.

2. DNR Particulate Matter Regulations, NR 415

DNR does not acknowledge that NR 415 was developed for compliance with a total suspended particulate air standard prior to the creation of more stringent ambient air standards for PM10 and PM2.5. DNR has not presented evidence that NR 415 adequately controls PM10 and PM2.5 at all facilities. This is especially true for PM2.5 as DNR relies on only regional monitoring data and has not required ambient air monitoring at permitted facilities to determine compliance with the air standard.

3. Independent / Citizen Research

DNR also minimizes evidence from so called "independent / citizen research" by failing to distinguish between citizen monitoring efforts and more robust, independent studies that have been published in peer-reviewed journals. DNR references such studies without much analysis and dismisses them by concluding, "However, final reports and conclusions are independently produced and do not necessarily reflect the advice and expertise provided by the DNR."[5]

Notably, DNR does not qualify its discussion of facility monitoring of crystalline silica in this way. Instead, DNR presents the findings definitively. "Facility-sponsored studies indicate that industrial sand mine contribution to crystalline silica concentrations in the ambient air are minimal."[6]

But when it comes to independent / citizen research, DNR does not describe the findings of published studies that happen to contradict with DNR's position. The Strategic Analysis states, "Independent monitoring and research tends to have similar results as the DNR monitoring, but there are often significant differences. Many of these differences are due to differences in methodology, study design and presentation of limited data sets versus established standards."[7] DNR does not describe the "significant differences" with the results of DNR's monitoring. As an example of the information omitted, one published study provides preliminary evidence that

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[4] Attachment B (U.S. EPA, Comments to Kristin Hart, DNR, regarding draft initial Title V permit and new source review permit for Wisconsin Proppants, permit number #627026620-P01 and 15-MHR-161 (July 21, 2016)) (emphasis added) (citing Richards, J. and Todd Brozell. (2015) "*Assessment of Community Exposure to Ambient Respirable Crystalline Silica near Frac Sand Processing Facilities*." Atmosphere 6:920-982).
[5] Strategic Analysis at 2-34.
[6] *Id*.
[7] *Id*.

PM2.5 from industrial sand facilities may cause or contribute to exceedences of the PM2.5 air standard. For a robust, unbiased analysis, DNR should present these findings even if DNR disagrees with the methodology or results.

Comment: DNR should revise the air quality section:

- To present unbiased conclusions that reflect all available evidence, even where there is conflicting evidence;
- To acknowledge EPA's contrary position about PM2.5 emissions and the impacts of DNR's position that does not estimate or limit PM2.5 emissions;
- To present data from so-called independent / citizen research; and
- To assess the adequacy of particulate matter regulations in NR 415 to achieve compliance with PM10 and PM2.5 air standards.

B. Groundwater and Surface Water Sections Do Not Fully Evaluate the Potential Environmental Impacts or the Adequacy of the Regulatory Framework to Address Potential Environmental Impacts

1. Potential Water Quality Impacts

The Strategic Analysis identifies several potential impacts from industrial sand mining to both groundwater and surface waters of the state. These include, among others, drawdown of groundwater and changes in groundwater chemistry from groundwater withdrawals, "increased concentrations of dissolved metals in groundwater", and "increased siltation, erosion, loss of spawning and nursery habitat, decrease of macroinvertebrates, and mortality of aquatic organisms" in surface waters.[8] While acknowledging these potential impacts is vital, the Strategic Analysis fails to provide important information and context that is needed to help inform the public and decision-makers about the seriousness (or lack thereof) of the various threats to the water resources of the state. This is the type of information that is important to include in the Strategic Analysis as it will assist decision-makers in prioritizing resources to address the issues with the greatest potential for impact.

An example of an issue that could be expanded upon is the draft Strategic Analysis's discussion of high-capacity wells. The Strategic Analysis notes the significant increase in groundwater withdrawals within the industrial sand mining industry over the last several years, but provides no context within which to understand whether the increased withdrawals are a cause for concern or not.[9] The Strategic Analysis should evaluate whether there are certain geographic areas where industrial sand mining has or is likely to occur that are more susceptible to groundwater impacts due to increased withdrawals. Additionally, the Strategic Analysis should address whether impacts are already occurring in areas where the industry is prominent.

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[8] Strategic Analysis at 2-47, 2-41, and 2-67.
[9] See *Id*. at 2-47.

Similarly, the Strategic Analysis should include additional information related to the accumulation of fine particulates in unlined ponds and the potential for reduced infiltration rates. The Strategic Analysis merely mentions that "infiltration rates in unlined ponds may reduce over time as fine particles accumulate."[10] The accumulation of fine particulates, however, is a significant issue facing the industry and has led to several past instances of discharges of pollutants to surface waters. DNR staff has previously acknowledged that the problems related to the accumulation of fine particulates in unlined ponds are pervasive throughout the industry: "Pretty much all of these frac sand mines are having problems with colloidal clay in their storm water ... the industry caught us off guard."[11] The Strategic Analysis should include a more detailed discussion of the potential impacts, whether the industry has addressed this problem, and if not, what steps if any can be taken by DNR, local regulators, or the industry to minimize the impacts to surface water.

The purpose of strategic analysis is to "[s]tudy, develop, and describe appropriate alternatives" to actions that involve unresolved conflicts of available resources and "[i]nitiate and utilize ecological information in the planning and development of resource-oriented projects."[12] In order to fulfill this purpose, the Strategic Analysis should provide sufficient information and context to assist the public and decision-makers to evaluate the proper course of action in regulating the industrial sand mining industry.

Comment: DNR should revise the Groundwater and Surface Water Sections:

- To include and evaluation of whether there are certain geographic areas where industrial sand mining has or is likely to occur that are more susceptible to groundwater impacts due to increased withdrawals.
- To include an evaluation of whether groundwater impacts are already occurring in areas where the industry is prominent.
- To include a more detailed discussion of the potential impacts of fine particulate accumulation in unlined ponds, whether the industry has addressed this problem, and if not, what steps if any can be taken by DNR, local regulators, or the industry to minimize the impacts to surface water.

2. *Evaluation of DNR's Water Quantity and Quality Regulations*

[10] Strategic Analysis at 2-40.
[11] Knight, J., Water coming from sand mines clouding streams, *Leader-Telegram* (Dec. 1, 2014) (available at: http://www.leadertelegram.com/News/Front-Page/ 2014/09/13/Water-coming-from-sand-mines-clouding-streams.html) (last accessed Aug. 22, 2016).
[12] Wis. Stat. § 1.11(2)(e) and (h); Wis. Admin. Code § NR 150.10(1) (stating "This section establishes the procedures to fulfill the requirements of s. 1.11 (2) (e) and (h), Stats.").

The draft Strategic Analysis should evaluate whether current water regulations and permits adequately address potential water impacts. Many if not all of DNR's pertinent water quality and water quality regulations were adopted prior to the influx of industrial sand mining in Wisconsin. Now that the industry has been established in Wisconsin for several years, DNR should draw from its regulatory and permitting experience with the industry to identify areas where existing regulations are not sufficiently protecting water resources and evaluate whether regulatory and permitting changes may be needed.

The Strategic Analysis notes that DNR is updating its WPDES Nonmetallic Mining Operations General Permit to "address the specific concerns associated with sand washing, processing and drying operations and the degree of processing at industrial sand mining facilities."[13] It does not, however, explain what those concerns are, how the general permit will be updated to address those concerns, or whether there are any concerns that cannot be addressed through reissuance of the permit itself. This information would be helpful for the public and decision-makers to be aware of; to both provide reassurance that the concerns are being addressed and identify areas where additional action may be necessary.

Additionally, the Strategic Analysis should contain further discussion of how the recent Attorney General's Opinion regarding regulation of high capacity well applications will affect the regulation of industrial sand mining. As discussed in the Strategic Analysis, under the Attorney General's Opinion, which DNR has since adopted, "DNR lacks the explicit authority to consider cumulative impacts when evaluating a high capacity well application."[14] This represents a major shift in the DNR's regulation of high-capacity wells and the implications of this policy change should be discussed in more depth in the Strategic Analysis.

With the exception of a few limited categories of high-capacity wells, under the new Attorney General opinion the DNR will not evaluate whether high capacity well applications that the agency approves will cause significant degradation of environmental quality including biological and ecological aspects of the affected water source. The Groundwater Section should include a discussion about how many areas of the state are susceptible to the cumulative impacts of multiple high capacity wells in close proximity, and the fact that now the DNR will have no way to assess whether or not the high capacity wells it approves will result in cumulative impacts to waters of the state.

Comment: DNR should revise the Groundwater and Surface Waters Sections:

- To identify areas where existing regulations are not sufficiently protecting water resources and evaluate whether regulatory and permitting changes may be needed.

[13] Strategic Analysis at 2-51.
[14] *Id*. at 2-47

- To identify the specific concerns related to the WPDES Nonmetallic Mining Operations General Permit, how the general permit will be updated to address those concerns, or whether there are any concerns that cannot be addressed through reissuance of the permit itself.
- To include a discussion about how many areas of the state are susceptible to the cumulative impacts of multiple high capacity wells in close proximity, and the fact that now the DNR will have no way to assess whether or not the high capacity wells it approves will result in cumulative impacts to waters of the state.

C. Reclamation Section Does Not Describe Potential for Reclamation Failure or Limitations on Financial Assurances

The discussion of reclamation in the Strategic Analysis does not reflect the negative impact on the environment, our agricultural land, property values, and local government resources. The Strategic Analysis describes the legal framework of the reclamation program, but does not analyze whether it is being adequately carried out and enforced.

Reclamation plans are approved, administered, and enforced by many local governments. We are not aware of any comprehensive analysis of whether ongoing reclamation is successful—not only at a small sample of facilities, but across all facilities—and whether future reclamation activities will be successful. We define success as not only achieving the post-mining land use identified in the reclamation plan, but also achieving that with minimal impacts to water resources now and in the future, and without undue burden on local government resources.

MEA staff reached out to some county-level officials about ongoing reclamation. We did not hear of any ongoing concerns about reclamation, but one county official noted that reclamation oversight may be handled by city officials who may not have the expertise to ensure adequate bonding or adequate reclamation.

Given the DNR's oversight role in the reclamation program and its preparation of this Strategic Analysis, it is appropriate for DNR to investigate this issue. Some outstanding questions include:

- Following reclamation plan approval and during the ongoing mining, does the RA assess that the amount of financial assurance equals outstanding reclamation costs as this changes over time?
- What process is used to determine the adequacy of financial assurance over time?
- Have any bonds used for financial insurance been cancelled by the bank resulting in inadequate financial insurance?
- Does the local government and RA have the resources and expertise to determine the adequacy of financial assurance and the successful completion of reclamation?

Even where reclamation achieves the post-mining land use, the reclamation process has limitations that DNR should acknowledge in the Strategic Analysis. One of the costs of industrial sand mining is the loss of agricultural productivity. As DNR acknowledges in the Strategic Analysis, "Reclamation of agricultural lands back into productivity may need to be measured in decades not years. Soil properties will likely not "catch up" and the productivity may always be

less than the land before mining unless extensive measures are used on the reclaimed mine."[15] During this time, the state economy loses out on the value of this agricultural land. Another limitation of the reclamation process is the lack of ongoing monitoring. The law requires that reclaimed sites comply with water quality standards and groundwater protection standards, but does not require monitoring. This requirement is essentially meaningless if there is no ongoing monitoring or enforcement after reclamation.

Many commenters during the public hearing raised concerns about reclamation. The Strategic Analysis should reflect local residents' experiences and concerns about the reclamation process to provide a neutral analysis beyond a recitation of way the reclamation process should work.

Comment: DNR should revise the discussion of reclamation:

- To incorporate the experience of residents and local governments in the reclamation process; and
- To clearly acknowledge the limitations of reclamation that may result in the loss of agricultural productivity and water pollution.

Respectfully Submitted on August 22, 2016,

Sarah Geers
Staff Attorney
Midwest Environmental Advocates

Jimmy Parra
Staff Attorney
Midwest Environmental Advocates

[15] Strategic Analysis at 3-98.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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AUG 2 6 2015

Ms. Kristin Hart
Chief
Permits and Stationary Source Modeling Section
Bureau of Air Management
Wisconsin Department of Natural Resources
PO Box 7921
Madison, Wisconsin 53707-7921

REPLY TO THE ATTENTION OF:

Dear Ms. Hart:

The U.S. Environmental Protection Agency has reviewed the Wisconsin Department of Natural Resources' (WDNR) draft "Guidance for Including $PM_{2.5}$ (Particulate Matter of less than 2.5 Micrometers) in Air Pollution Control Permit Applications". EPA has some concerns with WDNR's guidance, particularly with WDNR's conclusions that "$PM_{2.5}$ emissions will not be estimated in an air permit review for fugitive dust sources, mechanical handling, grain handling, and other low temperature particulate sources."

EPA is also concerned by WDNR's statement that "Permit applicants should assume that mechanical processes such as crushing, grinding, sanding, sizing, evaporation of sprays, suspension of dusts, etc. are not sources of $PM_{2.5}$ emissions and not include $PM_{2.5}$ emission estimates for these types of sources in the application. This includes applications for all permit types including non-Title V and Title V operation permits, registration and general permits, minor source construction permits, and PSD (Prevention of Significant Deterioration) and NAA (Nonattainment Area) major source construction permits."

EPA's May 20, 2014, "Guidance for $PM_{2.5}$ Permit Modeling" provides "that each permitting action will be considered on a case-by-case basis". Therefore, a blanket $PM_{2.5}$ exemption cannot be given to exempt such a broad range of source types from permitting requirements. All sources need to evaluate their emissions of $PM_{2.5}$ for major source applicability. While some sources with mechanical processes or fugitive dust may have low or negligible emissions of $PM_{2.5}$, this should be determined on a case-by-case basis. There have been numerous $PM_{2.5}$ studies by EPA, academic institutions, and industry groups which demonstrate that emissions of $PM_{2.5}$ from mechanical processes are not all zero. Some examples include the April 2003 Emission Factor Documentation for AP-42 Final Report for Emissions from Grain Elevators and Grain Processing Plants[1], the November 2, 2001 Emission Factors for Barges and Marine Vessels Final Test Report[2], and the "TEOM-Based Measurement of Industrial Unpaved Road PM_{10}, $PM_{2.5}$, AND $PM_{10\text{-}2.5}$ Emission Factors" by John Hayden, Vice President for Environmental Affairs, National Stone, Sand & Gravel Association, and John Richards,

[1] http://www.epa.gov/ttn/chief/ap42/ch09/bgdocs/b9s0909-1.pdf

[2] http://www.epa.gov/ttn/chief/ap42/ch09/related/rel_c09s0901.pdf

President, Air Control Techniques[3], which provided continuous, real time measurement of PM_{10} and $PM_{2.5}$ concentrations and found that a percentage of the PM emitted was in fact $PM_{2.5}$. ("TEOM" is tapered electrode oscillating microbalance, and "PM_{10}" is Particulate Matter of less than 10 Micrometers.)

WDNR's guidance refers to a de minimis level for $PM_{2.5}$, "This memo offers guidance to permit applicants on when it is appropriate to assume that a given emissions unit emits $PM_{2.5}$ emissions above *de minimis* levels..." However, it is unclear what de minimis level WDNR is referencing. The Significant Monitoring Concentration for $PM_{2.5}$ was vacated and the Significant Impact Level for $PM_{2.5}$ was repealed as a result of the January 22, 2013 US Court of Appeals for the District of Columbia Circuit's decision. The significant emissions rate, which is used to determine PSD and Nonattainment New Source Review (NSR) applicability, is not intended to be compared to emissions from individual units, but rather is to be compared to the sum of all emission increases from each unit affected by any given project. While the $PM_{2.5}$ emissions from mechanical processes alone may not result in a significant emissions rate, a project involving multiple emission units, for example both a mechanical process and a combustion unit, may together necessitate PSD review. For this reason it is essential that $PM_{2.5}$ emissions be evaluated on a case-by-case instead of assuming that $PM_{2.5}$ emissions are zero for all mechanical processes.

Further, fugitive PM emissions, including $PM_{2.5}$ are required to be included in calculating the potential to emit of certain stationary sources. These sources include any belonging to one of the 28 named PSD source categories explicitly listed in section 169 of the Clean Air Act (Act) as being subject to a 100 tons per year emissions threshold for classification of major sources and, according to 40 C.F.R. 52.21(b)(1)(iii)(aa) "any other source category which, as of August 7, 1980, is being regulated under section 111 or 112 of the Act." This is important because fugitive emissions can determine whether a source is a major source for purposes of NSR.

Additionally, the major NSR regulations are intended to require each unit that emits the pollutant for which the overall project emissions exceed the significance rate to undergo Best Available Control Technologies (BACT) or Lowest Achievable Emissions Rate (LAER) review, regardless of whether the individual unit's emissions are significant on their own. It is not appropriate to broadly state that $PM_{2.5}$ emission limits, including BACT or LAER, will not be established for mechanical processes. ("Since mechanical processes are not considered significant sources of $PM_{2.5}$ emissions, no $PM_{2.5}$ limitations for these types of emission units will be included in permits for major PSD sources or major modifications to PSD sources.") Rather, if PSD is triggered, a BACT or LAER analysis should be conducted on a case-by-case basis for each unit whose emissions contribute to the net emissions increase of the project.

Overall, EPA does not believe that a broad statement that mechanical processes do not emit $PM_{2.5}$ is accurate or appropriate. EPA believes that such an assumption may cause WDNR to issue permits that are inconsistent with its State Implementation Plan and with the federal major NSR program. EPA urges WDNR to revise this guidance so that it does not apply to major NSR or affect how major NSR applicability is determined.

[3] http://www.epa.gov/ttnchie1/conference/ei14/session7/hayden.pdf

We appreciate the opportunity to review WDNR's guidance documents and we look forward to working with you to address them. If you have any questions, please feel free to contact Susan Kraj, of my staff, at (312) 353-2654.

Sincerely,

Genevieve Damico

Genevieve Damico
Chief
Air Permits Section

Cc: Kevin L. Gunderson, Environmental Specialist
Ho-Chunk Nation Environmental Health Department
PO Box 636
Black River Falls, WI 54615

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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JUL 21 2016

REPLY TO THE ATTENTION OF

Ms. Kristin Hart
Chief
Permits and Stationary Source Modeling Section
Bureau of Air Management
Wisconsin Department of Natural Resources
PO Box 7921
Madison, Wisconsin 53707-7921

Dear Ms. Hart:

The U.S. Environmental Protection Agency has the following comments on the Wisconsin Department of Natural Resources' (WDNR) combined draft initial Title V permit and new source review permit for Wisconsin Proppants, permit number #627026620-P01 and 15-MHR-161. In order to ensure that the project meets federal Clean Air Act (CAA) requirements, that the permit will provide necessary information so that the basis for the permit decision is transparent and readily accessible to the public, and that the permit record provides adequate support for the decision, EPA recommends that the following points be addressed:

1) 40 CFR 70.5(c)(3) requires the source to provide emission-related information as part of the permit application, including all emissions of pollutants for which the source is major and emissions of all regulated air pollutants. Pursuant to 40 CFR 70.2, "regulated air pollutant" includes "Any pollutant for which a national ambient air quality standard (NAAQS) has been promulgated" and thus includes particulate matter of less than 2.5 micrometers ($PM_{2.5}$). Further, 40 CFR 70.3(d) requires that fugitive emissions from a Part 70 source must "be included in the permit application and Part 70 permit in the same way as stack emissions, regardless of whether the source category in question is included in the list of sources contained in the definition of major source." WDNR's February 2016 report entitled "Air Quality Review of Industrial $PM_{2.5}$ from Stationary Sources in Wisconsin" (henceforth referred to as the TSD), states that mechanical units are not likely to "cause or contribute to a violation of the NAAQS". A determination that an emission unit does not cause or contribute to a violation of the NAAQS does not necessarily equate to no emissions from the unit. As frequently seen in ambient air impact analyses, an emission unit can emit significant quantities of a pollutant and still not cause, by itself, a violation of the NAAQS. WDNR's statement that mechanical units are unlikely to negligible does not address the explicit Part 70 requirements to quantify emissions rates. As WDNR's TSD relies upon an analysis of regional ambient air monitoring and provides little analysis of $PM_{2.5}$ emissions at the source level, EPA does not believe that the TSD provides sufficient evidence to substantiate the claim that there are zero or negligible emissions of $PM_{2.5}$ from mechanical sources. Similarly, while the study cited

by WDNR[1] may indicate that activities associated with sand mining are unlikely to have significant effects on the ambient concentration of particulate matter of less than 4 micrometers, the study does not provide direct evidence that there are zero or negligible emissions of $PM_{2.5}$. Compliance with Title V requires WDNR to quantify the $PM_{2.5}$ emissions from the mechanical sources at the facility. WDNR's failure to consider $PM_{2.5}$ emissions from mechanical sources, including fugitive emissions, is not allowable under Title V of the CAA and the permit record is currently deficient. EPA urges WDNR to include $PM_{2.5}$ emissions calculations for the mechanical units at Wisconsin Proppants using the best available information.[2]

2) WDNR has proposed to remove the $PM_{2.5}$ emissions limits for the fluidized bed dryer, dry plant building, storage tanks 1-4 and truck loadout, truck unloading and railcar loading station (S60) which were introduced in permit 14-MHR-116. These limits were adopted because when emissions were limited to those emission rates modeling showed that the NAAQS were not violated. This seems to imply that modeling using the maximum theoretical emission rate for each emissions unit would result in modeled a violation of the NAAQS. WDNR justifies the decision to remove the $PM_{2.5}$ limits by stating that emission are negligible and that mechanical sources such as dryer, dry plant building, storage tanks and loadout operations do not emit $PM_{2.5}$. As discussed in Comment 1 above, and evidenced by studies reviewed by EPA in Attachment A, evidence suggests that mechanical emissions units such as those at Wisconsin Proppants do emit $PM_{2.5}$. In the case of Wisconsin Proppants, site specific data lead WDNR to conclude that if limits were not imposed on these emission units then the facility could cause or contribute to a violation of the NAAQS. While states generally have discretion in the implementation of minor permitting programs, a state's the new source review program is required to prevent the construction of sources that would interfere with attainment or maintenance of a NAAQS or violate the control strategy in nonattainment areas[3] and this requirement is codified in Wisconsin Statute 285.63(1)(b). Since site-specific information such as stack heights, topography, meteorological data and emission rates can impact local air quality, EPA believes that it is not appropriate to invalidate the conclusions reached by the initial site-specific ambient air quality analysis by relying on WDNR's TSD or unsubstantiated statements that the units do not emit $PM_{2.5}$. EPA believes that prior to removing the emission limits, WDNR must provide additional, site-specific justification explaining why the removal of the $PM_{2.5}$ limits would not cause or contribute to a violation of the NAAQS.

3) It appears that WDNR recently approved a Type A Registration Permit (#627036630-ROPA) for a rail loading facility owned by Wisconsin Proppants located about 2 miles from the Hixton mine and plant. This rail loading facility will be used to unload dry sand

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[1] Richards, J and Todd Brozell. (2015) ***"Assessment of Community Exposure to Ambient Respirable Crystalline Silica near Frac Sand Processing Facilities."*** Atmosphere 6:960-982

[2] AP-42 is only one resource, WDNR may use other available resources to determine a more reliable emission factor, including site-specific emission factors, other scientific literature, or emission testing from similar sources must be used to determine the $PM_{2.5}$ emissions. Even if the studies used to develop AP-42 are excluded, several scientific studies give EPA reason to believe that mechanical sources such as haul roads do emit some level $PM_{2.5}$. EPA has provided several of these studies in Attachment A.

[3] See 40 CFR 51.160(b)(2)

shipped from the Wisconsin Proppants processing facility via truck and transfer the sand to enclosed storage silos, conveyors and rail cars. The Preliminary Determination Document for the Wisconsin Proppants processing facility makes no reference to the proposed rail loading facility. Please explain why the two facilities are not a single source under the Prevention of Significant Deterioration (PSD) program or Title V.

4) Page 38 of the Preliminary Determination document indicates that after the proposed modification, the facility will emit 360.2 ton per year of non-fugitive particulate matter (PM), which exceeds the 250 year major source applicability threshold. However, Page 39 indicates that the facility will remain a minor source for PSD purposes. It appears that either the statement that the facility is a minor source, or the emission estimates for PM is incorrect. Please verify the calculations and provide a justification as to whether the source is now major for PSD. Additionally, please provide an explanation as to whether the project is subject to PSD.

5) Permit condition I.ZZZ.2 contains requirements for the facility's fugitive dust plan. However, it is unclear if the facility is required to submit updates to the plan to reflect the changes authorized by the construction permit. Please consider clarifying what elements whether updates to the plan are required and if these need to be submitted to WDNR.

6) Draft permit condition I.ZZZ.2.c.(3) on page 40 states that " the permittee shall submit any revisions to the fugitive dust plan to the department within 30 days prior to the revisions taking effect". EPA suggests revising the condition to read, "to the department 30 days prior" to clarify the timing of the submittal.

7) Draft permit conditions I.B-E.3.a.(1), I.F.3.a.(1) and I.H.-J.3.a.(1) appear to contain a requirement from 40 CFR 60.672, however this is not included in the citation to origin and authority. If appropriate please add the citation to the federal New Source Performance Standards to the origin and authority of the condition.

8) Draft permit condition I.A.3.(b)(2) on page 9 references condition (5), however condition (5) does not exist. Please revise the citation as appropriate.

We look forward to working with you to address all of our comments. If you have any further questions, please feel free to contact Andrea Morgan, of my staff, at (312) 353-6058.

Sincerely,

Genevieve Damico

Genevieve Damico
Chief
Air Permits Section

Attachment A

Chang-Tang, C. (2004). ***"Assessment of Influential Range and Characteristics of Fugitive Dust in Limestone Extraction Processes."*** Journal of the Air & Waste Management Association 54(2): 141-148. http://search.proquest.com/docview/214368290?accountid=171501

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Willger, Christopher J - DNR

From: [redacted]
Sent: Friday, August 19, 2016 3:31 PM
To: DNR ISMSA
Subject: money-making and economy alternatives to frac sand mining

According to http://www.solar-nation.org/can-switching-to-solar-panels-save-me-money, the average person who installs solar power saves between $44 and $187 each month on electricity bills. According to http://www.greencarreports.com/news/1080871_electric-car-price-guide-every-2015-2016-plug-in-car-with-specs-updated, electric cars that you can plug in to homes are becoming cheaper and more popular. If they got plugged into homes with solar power, then think about how much money everyone would save on fuel and electricity. What if we left behind sand mining and everyone in that business moved into the green energy business? With all the capital, we could lower the prices of green energy so everyone would purchase it and then shift the economy that way. I know it isn't that simple, but it could be done if everyone compromises and still gets what they want in a different way. Is there a chance the electric car companies such as Madison Gas and Electric, the solar companies such as Full Spectrum Solar and Milwaukee solar, the Wisconsin Industrial Sand Association, and the biggest gas, oil, and electricity companies in Wisconsin could have a meeting to discuss this? There could even be a competition; the company who succeeds in being the most environmental gets a financial award. Just a thought and I hope this helps.....

[redacted]

Willger, Christopher J - DNR

From: [redacted]
Sent: Wednesday, July 20, 2016 7:32 PM
To: DNR ISMSA
Subject: No more runing wisconsin....

We have power lines for Mn. We have fracking. Enough is enough. This must come to an end. I have lived in so many beautiful places. Fiji, Tonga, New Zealand. Cal. Or. Co. I was born in So. Wi. I found the blue hills of North Wi. This is a rich land for tourism and beauty. One of the most beautiful parts of the earth.

Please do not hurt our state any more. Let's be the last state standing that is the purest, if in this world that is rapidly loosing beauty that will never return. The money is not worth it.

The grand kids and the wildlife so much richness for others to see and discover. Make the money that way.

Soon nature and pure places will be the MONEY maker. I honestly know this to be true. People come here for this beauty. I am a woman who has had a very difficult life. Much illness, I traveled to where the South Pacific to heal my body. I than came back to Wi.

Also these big Factory Farms are very bad. I don't think the one here is regulated. The cow chemicals and crap you smell it for a mile down the road easy. It makes me gag, and cough.

I just don't understand. Is money really that important. I remember when Wi. was known for being such a wholesome state. When I would travel people would say oh yes WI. I hear it is a beauiful state expecially in Northern Wis. We were known for contented cows, happy cows. Dairy land.

Wi. is the second leading State in Or. food next to Cal. I say let's give Cal a run for there money and thing ahead. We have to be smarter than the rest. We will have the best resource with the best place to see nature and beauty. We can be the leading state. Please consider this avenue.

With Respect,

[redacted]
Bruce Wi.
54819

Willger, Christopher J - DNR

From: [redacted]
Sent: Monday, August 08, 2016 7:33 PM
To: DNR ISMSA
Subject: Official Testimony re: WI DNR Industrial Sand Mining Strategic Analysis

To Whom It May Concern:

I am concerned that the WI DNR, which previously had the outstanding reputation of being the best scientific analyzer in the USA, has drastically dropped downward away from that previous high standard of quality scientific analyzing upon which fair, democratic, and trustworthy decisions were made for the best interests of all WIsconsinites.

I am concerned that scientific methods and process are being sacrificed and dismissed in unscientific ways, and this is unacceptable because such unscientific decisionmaking is an indicator that excessive political decisions are being made at the expense of scientific decisions, and therefore at the expense of the best interests of all Wisconsinites. This is intolerable and unacceptable.

Scientific analysis by definition must include all potential impacts and possibly confounding factors in order to identify scientifically the parameters in order to seek sufficient reliable data regarding all, not just some, possible threats to public health or to wildlife or to environment. This has not been done sufficiently.

First and foremost, the studies upon which major conclusions are derived must not be funded by those with a vested interest in the outcome, particularly industrial profits. Those studies must be completely available to the public and to independent scientists in order for flaws to be identified that cause the conclusions to be less than accurate scientifically and to be unreliable in decision-making, particularly in terms of the full extent of public health and environmental damage and required mitigation that should demand that the original quality be restored in terms of air quality, water quality, soil water, diversity of wildlife and plant life, and landforms--essentially the entire environment must not be threatening long-standing homes with new pathways for flooding and damage and other problems. If an area was able to be organic certified prior to industry, it should be able to be organic certified after industry or the claims of equivalency are false and inaccurate. Mitigation historically has not went far enough in Wisconsin, and with the advent of the massive problems to be expected from global warming, we must strive to make mitigation much more equivalent to the original pre-industrial conditions of the environment and wildlife and air and water data.

The decisions must not be made until sufficient funding is made available for truly independent scientists to do studies to determine baseline environmental quality, such as continguous ecosystem data; number of species; number of endangered or threatened species; species in this most ancient landmass that likely have not been scientifically recorded; landform changes that likely adversely alter water absorption patterns that previously prevented dangerous flooding; airborne extremely fine particles of silicon that can be predicted to harm the respiratory systems of wildlife and humans; damage caused by chemicals planned to be industrially; adverse impacts on groundwater quality and levels; and much more considerations that require accurate scientific analysis and measurements BEFORE any reliable decisions can be made pertaining to what actually will be destroyed and lost forever and devaluing the worth of the State of Wisconsin.

The decisions musts not be made on insufficient data and faulty conclusions., Scientific analysis requires by definition complete and rigorous exploration of all conceivable impacts without dismissing any of them until sufficient measurements have been made and collected from trustworthy sources that are not biased and seeking

a specific conclusion. Studies, analysis, and conclusions made by industry are precisely that---industry analysis and opinions. Over the last 3 to 4 decades, industry studies have deteriorated from being somewhat reliable into only providing unreliable conclusions biased toward profits at any cost to the public where the public is left paying taxes to fix the pollution and problems left by industry that did not have sufficient reclamation funds, did not have sufficient bonding or other insurance to pay the full costs of its doing business. The public must not be left paying for decisions made by others in which it did not sufficiently profit or perhaps not profit at all. This is crooked politics with undemocratic decision-making when it harms the public, when it harms private landowners and property owners, particularly long-term family holdings that were based on high quality environmental values that are being systematically destroyed by industry for short-term profits that will not contribute to a sustainable future for Wisconsinites of the future as well as now. Harm to water and air quality is harm to all, and is unacceptable.

Adverse impacts upon lives and cultures of indigenous peoples of the present and the past must be considered with equal weight to environmental factors.

Adverse impacts upon local governments and local taxpaying systems must be considered with equal weight. Damage to local roads has been extensive. Damage to local tourism industry has been extensive. Damage to private businesses has been extensive. The frac sand industry must be made to mitigate financial damage to private property owners, private business establishments, tourism industry, and other financial damages it causes by changing rural agricultural area into heavy industry with heavy truck traffic, disrupting local values of quiet enjoyment, clean air without sand dirtying homes, play areas, schools, and local private businesses. All changes to local power from the Walker Administration are not valid due to the corrupted gerrymandered districts that allow the Republican Party unfairly and undeservedly to have complete control of the legislative and executive branches of government when the Democratic candidates received more than 50% of the vote. To the extent that this occurred, the Republican Party did not deserve to be claiming the power to take away local power in this undemocratic and crooked dishonest way lacking integrity in the election process. To the extent that this impacted on local power undeservedly to benefit frac sand industry is unethical and lacking in integrity in a criminal manner that should be held open into the future, particularly if any innocent property owners experience shortened life spans and death from frac sand industry undeservedly making grabs that go against the will of the people, particularly the local people.

It is time that accurate science must start being used to make every decision in Wisconsin by the DNR. It is time that the DNR stops ignoring inconvenient facts and facts that would cause the industry much more up front investments in insurance and in state-of-the-art protections for the local areas.

[redacted] I'm here to save the planet. We are the people that we've been waiting for to stand up and trust in the Greater Truth of the Universe that will support us to obtain freedom balanced with equality for all.

August 22, 2016

ISM SA Coordinator
Wis. DNR OB/7
P.O. Box 7921
Madison, WI 53707-7921

Re': Public Comment on Draft Strategic Analysis

Dear Coordinator:

I appreciate the effort to update the DNR report on industrial sand mining in Wisconsin, including the good-faith effort to receive citizen input both during the scoping process and now again on the final draft. So much has changed in the years since the 2012 Report that this update is desperately needed. I was one of many who submitted comment during the scoping process. I do believe that this draft Report has incorporated some of the concerns that were brought to the department's attention at that time.

However I recognize that the concerns I raised then are still not adequately addressed by this Analysis. It is my understanding that the primary purpose of the Strategic Analysis is to provide as much accurate and relevant information as possible to assist those making the important decisions about sand mining in making the very best decisions for the people they serve. Obviously, it must examine the impacts of this activity from many different angles. The perspective that gets short shrift in this Analysis is the impact on PEOPLE. The impact of this industrialization on rural communities is very real and should be carefully examined in any complete analysis.

The impacts on PEOPLE to which I refer are things such as the social glue of trust and good will and general neighborliness that binds a community together. Things like a since of security that a lifetime of investment in your home will build a reliable, predictable future----investment of hopes and dreams and hard work and dollars over the years. Things like the trust and confidence citizens expect to have in their elected officials and good governance. Things like faith in our elections, that they will be conducted fairly and openly and with respect for the laws of this state. These are some of the things that make a collection of neighbors into a community. And these are the very things that contention over frac sand mining has seriously eroded in community after community all across western Wisc.

These are very real impacts of frac sand mining. These are all impacts I have personally felt during the four years our township and neighboring towns have been living under the constant threat of industrial sand mines moving in. Yes, the DNR is rightly concerned to enumerate and study and monitor and regulate the impacts on the natural environment----wildlife, endangered species, forests, wetlands, fish and of course groundwater and surface waters. But what about the effects on PEOPLE? Aren't we, too, a 'natural resource' that deserves protection? I would argue that we are a most vital and crucial 'natural resource' in Wisconsin.

The DNR may argue that they have no statutory jurisdiction to regulate activities based on such detrimental impacts to the human population. Perhaps that is so. Perhaps that's the legislature's responsibility. But certainly there ought to be some authority that weighs and evaluates ALL the impacts of frac-sand mining, including the non-economic impacts on human social order, and regulates when necessary. And it is necessary to protect Wisconsin's PEOPLE as well as the natural world from the ravages of unfettered mining. I think we must be honest in acknowledging that, in many instances in un-zoned towns, it is virtually unfettered.

Please address these impacts on the people of Wisconsin in your final draft. A Strategic Analysis that fails to address these impacts is incomplete. Thank you.

Sincerely,

[redacted]
[redacted]
Fairchild, WI 54741

Submitted via e-mail to:
DNRISMSA@wisconsin.gov

Willger, Christopher J - DNR

From: [redacted]
Sent: Monday, August 22, 2016 2:05 PM
To: DNR ISMSA
Subject: Public comment about Strategic Analysis of Industrial Sand Mine

The Strategic Analysis of the Industrial Sand Mines in Wisconsin, although appreciated for the effort made, seems like a defensive paper about all that the WDNR is doing to assure the fast growth of the sand mine industry is not damaging to health, safety and welfare of Wisconsin citizens and land. It does not adequately include information and other research that would be contradictory to the thesis that frac sand is a safe and heavily regulated industry. Some examples are:

- The analysis indicates that problematic air quality has not been found near the sand mines. This is the opposite of what I hear from people who live near sand mines. Sand is found on neighboring property, and silica has been found in a citizen's fish pond 3 miles from the sand mine. I've personally witnessed sand blowing off the property of area sand mines. "Nuisance conditions" according to the Strategic Analysis is reported to be easily managed by DNR assuring the mine fugitive dust control plan is up to date and implemented. Based on the number of reputable citizens' complaints about fugitive dust, this DNR assurance of industry compliance is evidently not effective.
- NSPS opacity ratings are listed for emissions for a variety of mining functions. There is no explanation of how these opacity ratings relate to health and safety issues and standards. According to the Analysis DNR verification of opacities only needs to be done once per year. Having personally successfully completed the smoke school certification, I can assure you that once per year verification of opacity is not adequate. It is important for DNR to randomly check opacities to more frequently verify reliability of industry staff opacity measurements. It seems obvious that the industry may have a conflict of interest in accurately reporting any overage of opacities.
- Given the unplanned storm water discharges that have occurred in our area, it seems disingenuous for the analysis to indicate problems don't exist. The total suspended solids were significant enough to color the area streams for several days. There has been limited research done on the impact of frac sand run off on macroinvertebrates and fish. WDNR has not provided sufficient funding to research of TSS impact on streams.
- Mitigation for wetland filling is allowed outside of the site impacted by the fill. Is there assurance that the hydrology and quality of water are not impacted by these fills? While attending the hearings about such wetland fills, I hear corporate assurance there will be no impact but area citizens speak of the impacts they foresee. Again it appears the sand mine industry concerns are given more weight in the analysis than are area citizens.
- The analysis speaks to the importance of proper borehole abandonment. It does not address the cases where the industry has not appropriately abandoned the boreholes. Basically it is the area citizens who have to let the DNR know if boreholes are dug and if there is evidence of inappropriate abandonment. That may be effective **if** citizens are aware of the boreholes, the appropriate abandonment process, and the appropriate regulator to contact. The analysis does not address the randomness of this discovery process that can lead to necessary enforcement process. As established the borehole process relies upon the honesty of the sand mine prospectors who have been found to be at least on occasion not trustworthy.
- The control of invasive plant species is a huge issue within West Central Wisconsin. And as the analysis indicates disturbed land is extremely vulnerable to such invasive infestation. The analysis

indicates control practices “could” be done although there is no assurance the mine staff have appropriate training in the recognition and appropriate control techniques of invasive species.

- The reclamation section of the analysis does not speak to the controversy over reclamation plans. For a nearby proposed mine, land owners were told that their land would be reclaimed to tillable farm land. Experience has shown that post mining reclaimed land is not viable row crop soil. Additionally the plans submitted for reseeding for some of the plans I have reviewed have been inexpensive grasses which did not adequately reflect the goals for the reclamation land. Similarly there were very limited meaningful procedures established for evaluation of successful reclamation.
- Little is said of the loss of property value for properties neighboring sand mines. This is a serious issue for neighbors. And nothing is said of the infrastructure that will be left once the sand mine processing is completed. Living next to an abandoned sand mine infrastructure is not what most of us anticipated when we were either born in or moved to this rural area.
- It is difficult to place a value on the disappointment and loss of quality of lifestyle for those of us who live near sand mines. I greatly resent that companies can be given a priority to move into pastoral rural areas where citizens have long ago chosen NOT to live in an industrial area and who have long been stewards of the wildlife, forests, ag land and steady property tax payers. The analysis speaks to the stages where there is public input. Unfortunately we are in a position of having to prove why the sand mines are a bad idea or a bad neighbor. There is little to indicate the sand mines will be good neighbors with the exception of a few jobs that based on the nature of sand mining will not be long term.

Sand mines may represent a short term economic gain for a few people. The reality is for the rest of us there is little to be gained and a lot to lose. There is limited research about the safety of sand mines. **WDNR should be taking a precautionary approach** to the health, safety and welfare of citizens, not merely defending their position and assuming industry reports and studies are accurate.

Respectfully submitted,

[redacted]

[redacted]

Elk Mound, WI 54739

[redacted]

Willger, Christopher J - DNR

From: Fuhrman, Ethan Joseph <FUHRMAEJ@uwec.edu>
Sent: Thursday, August 25, 2016 4:14 PM
To: Willger, Christopher J - DNR
Subject: Re: ISMSA Comment

Sure. Here it is:

Dear Wisconsin Department of Natural Resources Representatives:

Thank you for putting the time and effort into updating the Industrial Sand Mining Strategic Analysis (ISMSA). This is truly a comprehensive document, but I do have concerns with some sections of the ISMSA, as outlined below, which I would like to request be addressed to provide an adequate assessment of the health impacts of industrial sand mining:

The summary of particulate matter (PM) monitoring only covers ~17% of the industry in Wisconsin (16 facilities conducting PM10 monitoring out of 92 active facilities), and has no mention of PM2.5 – which can be generated from the interstitial cement which binds larger quartz particles in the sandstone bedrock, and subsequently released during the extraction, storage, and sifting processes in particular – which raises some concerns about the adequacy and scope of the summary, as mentioned at length by a previous speaker.

PM4 respirable crystalline silica were found in excess of occupational PELs at hydraulic fracturing sites (NIOSH, http://www.ncbi.nlm.nih.gov/pubmed/23679563), and similarly, MSHA has found exceedances of respirable crystalline silica PELs at ISM facilities (Mine Data Retrieval System, http://arlweb.msha.gov/drs/drshome.htm). As mentioned in the ISMSA, "no standard methods have been developed, proposed, or accepted by air pollution agencies for monitoring PM4 particulate matter in ambient air, nor are there standards for PM4 in ambient air", the ambient PM10 and PM2.5 Federal Reference Methods are, however, fundamentally similar to what an ambient PM4 Federal Reference Method would be, and what the existing occupational monitoring methods for PM4 are (OSHA Analytical Method PV2121). Since excessive levels of PM4 respirable crystalline silica have been officially documented in occupational ISM settings, it is likely

that PM4 respirable crystalline silica is escaping into the ambient air. The DNR can utilize a dichotomous particulate sampler with relative ease to monitor for both PM10 and PM4, and respirable crystalline silica analysis methods used by Dr. John Richards and the Minnesota Pollution Control Agency to assess these concerns.

Additionally, providing in the final ISMSA draft substantial data on the utilization of fugitive dust control techniques, or compliance with fugitive dust control requirements under NR 415.075(6), would be useful to better illustrate how DNR policies concerning exemptions from PM monitoring under NR 415.075(4)(b) are justified.

Sincerely,
Ethan Fuhrman, BSEPH Candidate
Research Assistant

Ethan Fuhrman
Student Office of Sustainability Director;
Undergraduate Research Assistant:
Environmental Public Health & Chemistry;
UW-Eau Claire | 952.221.5544

From: Willger, Christopher J - DNR <ChristopherJ.Willger@wisconsin.gov>
Sent: Thursday, August 25, 2016 3:33:05 PM
To: Fuhrman, Ethan Joseph
Subject: ISMSA Comment

Ethan,

Can you email me a copy of your comments? Than I don't have to create a log in for the UWEC Onedrive.

Thanks,

We are committed to service excellence.
Visit our survey at http://dnr.wi.gov/customersurvey to evaluate how I did.

Chris Willger
Environmental Analysis and Review Specialist – Environmental Analysis and Sustainability
Wisconsin Department of Natural Resources
1300 W. Clairemont Ave.
Eau Claire, WI 54701
Phone: (715) 839-1609
christopherj.willger@wisconsin.gov

dnr.wi.gov

To DNR – Attn: ISMSA ~~coordinator~~
WDNR OB-7
P.O. Box 7921
Madison, WI 53707-7921

Re [redacted]

Dear Sir or Madam:

I am writing regarding the dust from the fracking operations which is making residents sick. The digging brings water and soil to the surface. Both of these are known to contain Elizabethkingia which I believe sickened 75 people and caused the deaths of at least 30 people.

I am writing to the CDC requesting them to investigate this possibility.

(I do not have a computer and don't believe in them)

Yours truly,

[redacted]

Eau Claire, WI 54701

[redacted]

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DNR mine report criticized

Residents say it downplays health risks; agency says it will address concerns

By Lauren French
Leader-Telegram staff

Residents from Wisconsin and neighboring states told the state Department of Natural Resources on Tuesday that the agency's draft report on state industrial sand mining appears to downplay public health concerns.

"I am disappointed by the lack of substance in this report," said Dwight Swenson of Hixton, "and that its purpose is presumably to provide the general public a false sense of security regarding industrial sand mining's impact on health, safety and well-being issues."

DNR officials say the report, which was released in June, is meant to summarize the best current information on sand mining, possible environmental impacts and applicable regulations. About 60 people started off the hearing at the Chippewa Valley Technical College, and many had suggestions for the report's improvement. Others came in as the hearing progressed. Since the hearing was the DNR's first time collecting public feedback, it will respond to comments on the report at a later date, officials said.

"Once we receive all of the public comments," said Roberta Walls, industrial sand sector specialist, "... we'll look for any deficiencies in the document that needs to be addressed ... and make additions or changes as needed."

The document, Walls said, will later serve as an informational tool for policymakers. It's a continuation of a study conducted in 2012. The agency hopes to have the report completed by the next legislative floor session.

Swenson and his wife, Ruth Swenson, live about a mile down the road from an active sand mine, they said. While the report says existing data does not detect problematic air quality at sand mining sites, the Swensons pointed out that their home is downwind of the mine, and they

See SAND Page 2A

DNR to accept comments until Aug. 22

»Sand
From Page 1A

notice negative effects on a daily basis.

"We already experience an unacceptable quantity of sand particulate raining on us daily," Ruth Swenson said. "I suggest that this draft be rewritten to accurately reflect the realities of ISM operations using empirically substantiated data."

The Swensons weren't the only speakers to come forward with complaints about living near sand mines, both active and inactive. According to the report, there are currently 128 industrial sand mine facilities in Wisconsin, 92 of which are active.

While there were numerous suggestions for improvement, many thanked the DNR for pursuing a study on potential sand mining impacts, and for offering the chance to comment on the draft.

"I want to start by thanking the DNR for putting the time and resources into this study," said Sarah Geers, a staff attorney with Midwest Environmental Advocates. "It's much more improved than the 2012 study."

Still, Geers urged the DNR to gather more data and start regulating earlier, as the "wait-and-see" approach could be damaging.

"We urge the DNR to regulate to prevent any potential impacts, and not to dismiss impacts until we have sufficient data to be sure that there (is no) ... damage being done that we may never be able to undo," she said.

To read the draft report, visit dnr.wi.gov/topic/eia/ismsa.html.

The DNR will accept printed and emailed comments until Aug. 22. Send printed comments to the DNR with attention to the ISMSA coordinator.

Contact: 715-833-9203, lauren.french@ecpc.com, @LaurenKFrench on Twitter

ISM Coordinator
Wisconsin DNR OB/7
P.O. Box 7921
Madison, WI 53707-7921

I'm for sand digging. I live near Weyerhauser and we really need the jobs the sand plant here brings and the money paid to Weyerhauser city.

One criticism I have is that the sand delivery trucks do not have mud flaps and they kick out rocks on the highway.

Thank you,

[redacted]

Bruce, WI 54819

Willger, Christopher J - DNR

From: [redacted]
Sent: Saturday, August 20, 2016 8:50 AM
To: DNR ISMSA
Subject: Strategic analysis comments

This Strategic Analysis has been a long time in coming. Frankly, I am disappointed in it, and I doubt that the DNR will take any more note of the public comments than they did of the scientific research that was already out there when doing this strategic analysis This strategic analysis contains much contradictory information, unsupported statements, things taken out of context, poorly written statements which are meaningless, and ambiguous wording. It looks to be pretty much what it is—a document meant to cover up and hide the truth.

For instance, it states in the Foreward, "There are no oil or gas wells located in Wisconsin, thus this document does not address the effects of hydraulic fracturing (fracking)." So why is there a section 1.2.2 which explains hydraulic fracturing and ends with "Wisconsin has no known oil or gas deposits. Therefore no fracking related to oil and gas production exists in the state." An explanation of Hydraulic Fracturing contradicts what is said in the Foreward.

The Foreward also states that "It summarizes our best current information on ISM operations in the state, the known and possible environmental impacts, and applicable regulations." Why does it summarize your best current information on ISM operations in the state? You were petitioned to do a Strategic Analysis of Frac Sand Mining. This introduction and information on Industrial Sand Mining looks like a smoke screen. Frac Sand Mining is only one aspect of Industrial Sand Mining. This is like being assigned to give a report on President Lincoln, but turning in a paper on the aspects of the presidential system of the United States. There is information included that pertains to President Lincoln, but you have to know the facts about him to begin with to sort out the information pertaining to him.

The first Table given is on Industrial Sand and Gravel production in the United States—not frac sand or silica sand but all industrial sand and gravel. The information given in the narrative says that in 2014 and 2015, "71% of the U.S. tonnage was used as frac sand and well-packing and cementing sand." What does this mean? How do just the frac sand numbers compare? Since this analysis is supposed to address frac sand, why aren't frac sand tonnages and percentages given?

I don't know if the intent is to be as ambiguous as possible, but there are many areas of this report that do nothing but confuse the issues. For example, one paragraph starts out, "According to the USGS report, industrial sand was used for many applications such as hydraulic fracturing, well-packing and cementing, glassmaking, foundry sand, whole-grain fillers, building products, whole-grain silica, ground and unground sand for chemicals, and other uses." But the next sentence in the paragraph says, "Industrial sand is either processed at the mine, or shipped to processing

facilities located in Wisconsin, and to sites close to fracking sites in other states. Processed sand is then shipped to oil and gas wells, which are primarily located in Pennsylvania, North Dakota, Texas, and other states where shale deposits contain economic reserves of oil and gas."

What is the subject of this paragraph? If this paragraph is referring to the different types of industrial sand mentioned in the first sentence, I doubt that industrial sand used for glassmaking or as foundry sand is going to be shipped to an oil well in Pennsylvania, North Dakota, or Texas. It might refer to some types of industrial sand or just frac sand or just frac sand mined in Wisconsin, but I doubt if frac sand mined in Arkansas is shipped to processing facilities located in Wisconsin. How can this strategic analysis be at all useful or believable when statements like this are made? When the subject of a sentence is not even made clear, how is the reader supposed to know what you are talking about.

There is also a lack of scientific data given in this analysis. For example, allowable fugitive dust emissions from blasting are limited to 10% opacity. Page 2-26 says, "When DNR inspectors have observed blasting activities at mine sites, inspectors have observed no significant fugitive dust emissions." Specifically, when and where did DNR inspectors observe blasting at frac sand mines? Who were these inspectors? Were they certified for "Visual Emissions Opacity" for reporting air quality problems or were they fish and wildlife inspectors just making a casual observation? Did they just use their subjective observations or were pictures taken and analyzed? There have been many pictures taken of fugitive dust near sand mines showing much more than 10% opacity both during and after blasting. Why aren't any of these included in this analysis? And what about specific PM 2.5 and PM10 measurements? These are the particles that are of the most concern healthwise (as stated at the beginning of section 2), yet the human eye cannot see particles smaller than about 30 microns, so PM10 and PM2.5 particles are not visible to the naked eye, and are not taken into account by mere observation. Where is the data about PM10 and PM2.5 levels at blasting, 10 minutes after blasting, 30 minutes after blasting, 1 day, etc. What are they at 50 feet from the blast site, 100 feet, 500 feet, ¼ mile, etc. Where is the scientific data a strategic analysis is supposed to provide?

Many regulations are cited in this report, as well as ways to monitor them. Where are the results of this monitoring? There is no evidence given that monitoring is indeed done or that it is within the limits given in the regulations. Once again, where is the scientific evidence? It is just claimed to be required. Many people have experienced the lack of monitoring. Much of the monitoring is self monitoring done by the mine. How accurate is that? Was any independent third party monitoring done and compared to the self-monitoring declared. What type of enforcement of regulations is even done? Many people have tried to report violations of regulations with no action from the DNR. This analysis fails to mention any of this. It does not even give the location of any of the monitoring that the DNR has cone. The few air monitors the DNR cites are not even located within a mile of a frac sand mine. How can a strategic analysis on the effects of frac sand mining include ambient air monitoring results from monitors that aren't even close to a frac sand mine?

So the bottom line of my public input is that this strategic analysis needs to have scientific data added, grammar checked, inconsistencies eliminated, and the focus on frac sand mining maintained.

[redacted]
Colfax, WI 54730

[redacted]

Willger, Christopher J - DNR

From: [redacted]
Sent: Friday, July 15, 2016 11:02 AM
To: DNR ISMSA
Subject: Strategic Analysis of Frac Sand Mining

To whom it may concern:

Frac Sand mining in Trempealeau County has thoroughly destroyed abundant natural resources and the quality of life of all citizens in the vicinity. The Wisconsin DNR has a responsibility to protect the natural resources of our state, whether air, water, soil, or wildlife.

At a minimum, DNR should be monitoring industrial sand facilities for acid mine drainage, presence of metals in groundwater, and changes of any kind in groundwater qualify. Monitoring should also be conducted for air quality and fine particulate matter.

Research and data should be conducted by private, independent organizations as industry-funded studies may be biased and financially motivated.

In addition, DNR should recognize and acknowledge the gravity of the potential for contamination of our air and water resources and the fact that once compromised, the impacts cannot be undone. The short term potential for economic gain is not worth destroying our state.

Thank you for your consideration.

[redacted]
Stoddard, WI 54658

Willger, Christopher J - DNR

From: [redacted]
Sent: Sunday, August 21, 2016 8:04 AM
To: DNR ISMSA
Subject: Strategic Analysis of Industrial Sand Mining

ISM SA Coordinator,

I send this email to lend my voice to the cry for scientific based analysis of sand mining in Wisconsin. No industry connected entities or people should be consulted in this analysis of the effects of Frac Sand Mining on the people and environment of Wisconsin.

If someone is paid not to see the fact then they will not see the facts.

The DNR should be protecting the health of Wisconsin citizens not facilitating their ill health and eventual death from polluted water and air. I could say more but it seems to fall on deaf ears.

[redacted]

Willger, Christopher J - DNR

From: [redacted]
Sent: Tuesday, July 26, 2016 1:08 PM
To: DNR ISMSA
Subject: Strategic Analysis on Industrial Sand Mining in Wisconsin

I ask that DNR heed the many, many hearings that have already been held state and nationwide regarding the stoppage of sand mining (especially frac sand), and place a time limit on the mines that are already operational in Wisconsin.

Frac sand mining has been proven to have adverse affects on health, and also effects our clean water, air, transportation routes, and our land use.

Also, it's been very clear that the companies that have opened and operate these mines have been allowed to do so due to less than honest presentations, poor planning, in many cases a lack of adequate or ANY impact analyses. Many -- if not all -- of these companies are not located in or from Wisconsin, and have only a profit interest in the destruction of our resources.

Over the past several years, I've been involved in the presentations in several communities in West Central Wisconsin relative to the implementation of new and expanded sand mines and rail spurs. I've been appalled at the dishonesty that has been clearly present at the company levels as well as the local government levels. There have been back room discussions and decisions, badgering and bullying of community members by government officials and company officials, and bribes by companies to get community members to sell property to them while swearing them to silence. That alone seems to indicate that what they are doing is not above board.

The fracking industry has long been dismissed by even oil companies as being a dangerous, extremely expensive and ineffective way to produce oil. Yet some oil companies are doing just that, at the expense of land, water, human and animal lives. The expense is incredible to the families, communities and animals in the areas not only fracking but the sand mining areas as well.

Now that we have these many mines operating in Wisconsin, the promises of big salaries/wages for workers, many jobs, trickle-down cash for communities have dwindled and in some cases, died altogether. Many of the "great--paying jobs" have disappeared, with layoffs of employees. Most or all of the best paying jobs, those of operators and administrators, were of course held by company implants. And the promises of great spoils of cash for the communities? Where are those? In the time that the fight over the Vista mine in Glenwood City took place, the promise from Vista of $250,000 per year payable to the City of Glenwood City dropped to a mere $37,000, "possibly." The Texas company has apparently ceased to exist, and it's owner is in prison. How are we to trust these companies?

We've heard and read reports by health agencies, state agencies, academia and others about the ill-effects of airborne sand from mines chemicals (which we cannot know about because they are part of a proprietary formula) which end up in the air, water and land, poisoning people, animals, water and air fowl and fish, and destroying the land.

We have seen and heard reports from agriculturists all over the country and the world regarding these operations' reclamation plans, and how ineffective they are, if they ever in fact take place at all. Where will a reclamation plan be if the company bankrupts, goes out of business, or simply pulls out? It would be like cashing in on a product warranty from a company that no longer exists. As for the effectiveness of reclamation,

there are experts internationally who also agree that soil dies over a period of time. Peel it off and set it aside for 5, ten, twenty five years, and it is simply dust. No longer productive or "alive." No longer able to sustain plants, animals and humans. Just a different colored layer over the sand pit.

The proposed Vista mine in Glenwood City would have been the closest to schools of any mine to date. Within 1/4 mile of the school, citizens were concerned about the health of their children to the point of many families moving away. Having seen how other mines were rammed through the local governments in neighboring communities, we were all convinced that it would happen there, as well, regardless of what the majority of people thought or wanted, and expressed. We were being forced to believe the word and "reports" of the sand mining company, and those few local individuals who would benefit from huge profits by their connection with the sand mine. Residents were not convinced that airborne and waterborne contaminants would be "safe" for them and their children.

With all of the bodies of water in Wisconsin, it is impossible that pollution would not affect these bird, fish and wildlife sanctuaries. I realize that our Legislature is poised to sell off public lands, and that is another issue. But the fright of that should also affect this hearing. We have so much beauty, clean air, land and water in this state, that we should be challenging every business and industry that wants to step foot in the state, not creating an atmosphere of fear and helplessness among our citizens.

Industrial leaders often boast that they have provided jobs and growth to the communities in which they arrive and set up camp, all from the goodness of their hearts and their wish to improve peoples' lives. I don't think the majority of conscientious and thinking people believe that scenario any longer. Most of us believe that in order for a company to exist at all, it takes a lot of local blood sweat and tears, as well as some hard-earned cash. Everything from tax breaks for companies (many of which are already extremely lucrative and pay their top executives billions) so that they will locate locally, community-funded land, water management systems, and roads, in order that they might come and bring their riches. They do come, but local citizens have a huge tax burden relative to those tax-breaks that now someone has to pay for, transportation costs that are huge due to the increased use of roads by heavy traffic, and safety risks due not only to the aforementioned chemicals and sand, but also because of the added exhaust dumped into the air by so many more trucks and cars, and the increased traffic in populated areas.

Please, I ask that the State and DNR severely limit the activities of sand mining that already exists in the state, and put a permanent moratorium on any future mines and/or fracking operations that are proposed. It is clear that they do not add any value to this state or its citizens. Shouldn't that be enough of a reason?!!

Sincerely,

[redacted]
Colfax WI

Phone and address below are for information purposes only, and NOT to be shared with anyone other than the recipient of this email:

[redacted]

[redacted]

[redacted]

Chippewa Falls, WI 54729

[redacted]

July 26, 2016

To: Wisconsin Governmental officials and the Wisconsin Department of Natural Resources Board

The remarks below were orally given at the public hearing on July 26, 2016 in Eau Claire, WI. Additional remarks will follow.

As a concerned citizen who has studied the issues and visited with many individuals about the frac sand mining industry in WI and other states for the past 8 years, I am here to comment on the white paper entitled **WI DNR Industrial Sand Mining Report** issued June 16, 2016. The attorneys from Midwest Environmental Advocates and many Wisconsin petitioners asked that the Natural Resources Board conduct a strategic analysis of frac sand mining. The report issued covers the waterfront on industrial sand activities including sand and gravel operations. Sand and gravel pits have been around for years whereas mining for silica for use in the hydraulic fracturing industry is relatively new and has not been studied extensively by the State of WI although citizens have petitioned the state earlier for a study of respirable crystalline silica along with a standard. I would ask that the focus(when you revise this report) be on the mining of silica including the processing and transload of the product labeled "frac" sand for use in the hydraulic fracturing industry. Don't waste your time trying to place sand and gravel pits in the same category! Potential health and safety impacts should be delineated throughout the report and **scientific studies** must be undertaken to substantiate or disqualify the continuing reports from the industry that all is well and safe and that the only illnesses that will occur with this industry will be stress and anxiety. The people who live around sand mines live in the reality of the heavy pollutants created by this heavy industry and daily

observe, experience and deal with the noise, the heavy dust blowing off these mines and processing plants, polluted water, the results of water tests done on wells and water sources which seem to be overlooked in this report, and the continuing applications that come to the counties for reclamation permits, and town boards many of which are still unzoned and have to rely upon unprepared elected officials to allow approval or disapproval.

The EQB report issued in Minnesota involved study committees comprised of officials, scientists and citizens to participate in developing a comprehensive report that was intended for use by county and town officials as well as citizens in the permitting process. While not perfect, it was meritorious they had the leadership and foresight to look ahead. Here in WI it appears that the outside forces appeared out of the weeds with power and funding early on to publish material that justifies the industry and also spread false information that has no scientific or research base to go on. We don't need that here in Wisconsin. In fact, the Department of Natural Resources Board should study the results of the resolution in April that was fully supported by all counties in the Wisconsin Conservation Congress meetings for a moratorium on the mining of silica after release of the strategic analysis that would allow scientific studies on mining issues be implemented so that safety and health could be assured among the citizenry. Comments (both oral and written) from the people affected by mining have been placed on a shelf somewhere and not considered. They have been labeled as terrorists in deference to the industry who have assumed front and center on the stage.

It behooves the policymakers and the DNR staff learn about what is occurring and listen to the people affected. Right now, the industry has slowed, but there are people willing to share in meetings such as this but also in the privacy of local gatherings.

I have witnessed lots over the period of 8 years and talked with many. I live about 2 miles away from the sand processing plant and transload area in Chippewa Falls. When the winds come from the north east, I find sand on my car…….the gritty sticky stuff. When it rains, I find the same on my deck equipment. People on the

west hill have reported sand on freshly washed clothing and on their vehicles. Is it from the plant or from the unnamed non-permitted transload facility below the hill? In traveling into the mining areas with scientists and photographers, we have observed silica blowing off the huge mounds of sand during light and heavy winds. No watering! No DNR personnel observing! No fines or citations! The standard answer is that silica mines are to be watered down, but the light bulb doesn't go on that watering in WI is impossible during the winter and even some fall and spring months. For many, the industry is valued because of increased jobs and an improved standard of living. Not considered are those who are impacted.

I will be writing a longer critique as time goes on before the Aug. 22 deadline. As time goes on, consider that fact that we are delivering our "dust" from silica mines or frac sand to people who live near transload facililties across this country and are exposing many people not only here but to those other destinations where childcare centers, schools, and senior centers exist. NIOSH reports (July 16, 2014) show that worker protections are not sufficient to protect workers in these areas and around the hydraulic fracturing site. What about those innocent people who know nothing about the potential for damaging exposure who are surrounded by several mining and processing plants in their neighborhood?

Pollution knows no boundaries in the frac sand industry! The industry has been here 8 years……and what science has truly proven that the industry is safe for Wisconsin residents?

<u>August 21, 2016-Additional Comments</u>

1. There seems to be a lack of reference to the work and leadership assumed by Dr. Crispin Pierce from the University of Wisconsin-Eau Claire who has involved his students in a great deal of scientific research as part of their learning experience. He has also involved the citizenry and spent considerable time making them aware of additional information regarding respirable crystalline silica and his concern for the health of the people living hear frac sand facilities. There was no mention of his peer reviewed study nor of the other information he and his students have generated and

shared. Yet, references have been made to writers from the Heartland Institute (a right wing think tank) who do not have the same credentials as Dr. Pierce as well as to the assumed "study" generated by the Institute for Wisconsin Health. There have been numerous efforts to discredit Dr. Pierce's work. By way of experience, I sat in on a committee of the Chippewa Co. Board of Supervisors one day and heard the Administrator and the County Board Chair say without reservation that the group should not believe the work of Pierce and that the industry appeared to have the best report because he uses college students and doesn't have the appropriate equipment (earlier citizens raised over $65,000 to assist in the purchase of appropriate equipment for use in scientific studies.) These officials obviously did not know about the equipment purchase. Clearly there has been bias generated from some government official to convey this message. His work needs to be included in the report and appropriate acknowledged without reservation. I know you allowed another professor to discuss other elements in the "dust" that seemingly was not carcinogenic with the entire air division staff in Madison.

2. It is good to know that the WDNR acknowledges that the issues surrounding heavy metals in the water (surface and ground) must be studied further. According to DNR studies, heavy metals have been found in storm water ponds, waste water ponds, and drinking water in frac sand mining areas. A DNR spokesperson indicated there was a concern about this finding at 3 conferences held within the state about 3 years ago. During meetings held in Chippewa Falls in 2008--2009, people who raised questions about the potential for heavy metals in frac sand areas were told hands down that there would be no problems associated with heavy metals in NMM operations. We were misled or lied to! Perhaps frac sand mining should be considered a **metallic** mining operation. I hope all information about the studies accomplished is published and considered before we open up one more facility in this state. And public health officials must be fully apprised of what actions they can take to assure the public that their wells are safe without vast expenditures of individual funds. There does not

seem to be a **plan** in the report for this study. Will the plan be reported out to the public so input can be obtained?

3. It appears that the State of Wisconsin is concerned only about opacity and stack emissions. Measuring "opacity" has been part of the protocol for the past 8 years. What is needed is a paradigm shift of thinking that only comes through a "scientific "peer reviewed study of the air particulates and the how they behave and how they affect people who come in contact with them on a daily basis. Far too much is given to chance when the industry is given the charge to observe them through opacity observations.
   To rely on opacity measures without a state standard and to minimize the use of monitors throughout the area or use fence line monitors only to measure PM2.5 or higher levels in the air is questionable. The presence of respirable crystalline silica in the air is dangerous. RCS is carcinogenic. Because Wisconsin lacks a standard, that information reinforces the fact that no reliable scientific study has been undertaken or applied by state leadership. Because Chippewa County has no monitor(it was removed from the airport at the southern end of Chippewa Co. when the mining issues began) to measure air particulates, county residents are not even made aware of "bad air" days when they occur. We have lots of windy days and drought periods, and silica is often carried in the winds by the many mines, processing plants and trans-load facilities located in the county alone. In regard to measuring or observing opacity levels, how many personnel in the DNR have been trained in reading opacity levels, hold a license to do so, and then renew their license to monitor air quality using this method? Because this sort of training is expensive, it is another method of consuming valuable tax dollars if we desire the public to be safe and healthy. To rely on one observer at each mine is not sufficient. It might be worthwhile to reveal the expenditures created at the department level in order to enforce the "opacity" rules promoted by the engineering firms as a method of telling whether the air is safe enough or not for breathing. Do you expect citizens to be trained in this method and maintain their license to do so? It seems much is left up to citizens to monitor and report and at the expense of the individual or some non-profit organization when

the state must be doing something to protect its taxpayers. By what process will the public be reimbursed if the department expects them to be trained?

What is the opacity level in the photo above? Is this a safe location for the citizen to be located?

What are the opacity levels at this location?

Gusts of wind often carry lots of respirable crystalline silica into the air. What is the opacity level of this mild sampling?

The Amish families live very near this location and are affected by the dust as well as the blasts which frighten their animals, shake the dishes in their cupboads, and yet they do not complain because of their religious beliefs. Their water wells have sand in them due to the blasting. We should not allow land to be destroyed when people live nearby without protections. Obviously this blast is not being watered down, the people are or will be breathing the after effects of this blast, and children, their animals and their households are slowing being destroyed as cracks are created in foundations in their homes.

A quote from the brave photographer: “One of the biggest blasts I have been at. I was told I had to get off the road from where I was parked because I was in the blast zone. I moved to the east and parked. The plume came over me and I went into a coughing attack. I told myself I was a fool and I should roll up my window and get out of there. It was massive. The plume hung around for more than 5 minutes. It was probably less than 200 yards from Amish homes.” JJ There are many more photos and journals kept like this one which document the devastating impacts of blasting in areas where minority people live.

I have read the information about dispersion modeling for assessing a facility’s compliance with federal ambient air quality standards. However, there is no discussion about the fact that under the DNR’s new PM2.5 guidance, frac sand operations are not required to conduct dispersion modeling for PM2.5 and thus there is no way to actually determine whether or not a facility is in compliance with PM2.5 National Ambient Air Quality Standards. It should be noted that the USEPA has objected to this new DNR policy on multiple occasions and has informed the DNR that

dispersion modeling for PM2.5 is in fact required under federal law in order to determine PM2.5 National Ambient Air Quality Standards

4. To expect a company to "self-report" in an industry that experiments in negative ways everyday with the lives of people and other life forms is asking for long term problems. The WDNR and the State of Wisconsin has had 8 long years of missed opportunity to begin scientific (non-industry funded) in-field studies to credit or discredit what the industry and engineering companies who serve to profit from this heavy industry say they know or don't know about mining/processing/ and trans-porting silica, a known carcinogen. MSHA, OSHA, and NIOSH (industry oversight) know the hazards, but we (the citizens) are repeatedly told that living around a mine or near-by related facilities is perfectly safe. Public health department officials appear to turn a blind eye to citizens when it comes to offering advice about daily exposures. Have health departments in the State of Wisconsin chosen that stand or been convinced not to become involved in the issues and told by higher powers to not respond to citizen requests for support and assistance?
5. Watering down the mines seems to be the only method of preventing respirable crystalline silica from blowing into the air. Specifics must be developed and companies must comply with regulations. In the picture below, it is evident that dust control methods may be old fashioned using obsolete equipment and that it can't be expected to operate during all seasons of the year in Wisconsin. What other methods will be allowed to completely reduce dust emissions from sand mining facilities? Certainly driving by a sand mine by DNR staff will not catch all violators; waiting a week to check out citizen complaints really doesn't work; and even records kept by mining companies can be altered. If no one is at the site, how can records be kept particularly in light of the fact that most companies are not operating.

Mines and other facilities are open 24x7x365. How many men and tankers does it take to water down a mine site for 365 days assuming there is not a freeze up?

6. Are there financial situations not considered? Some sand mining companies are selling their waste sand to farmers. If sold, a state sales tax and local tax applies. Are there records of sand mining operations who are selling sand for this purpose? If so, how much revenue is collected in local and state sales tax? This information should become part of this report. In addition, agreements are made via the land reclamation process to return all the waste sand to the pit sites. If waste sand is sold for bedding, are any mining companies in violation? There are reports that sand mixed with manure are being put on farm fields and reducing the crop production……another factor to add to the down side of using sand as a bedding product.
7. Farmers using frac sand in barns are not only exposing cattle to silica but their workers (many may be non-English speaking people). It is apparent that OSHA doesn't work with farmers on this issue, but many farming

operations may be exposing workers unknowingly to respirable crystalline silica if they work with cattle in enclosed barns with fans in operation for air circulation.

8. The State of WI should be sponsoring workshops and providing information for Town and County Boards so they can more adequately make decisions. Provide them with the tools to do a more than adequate job.
9. There should be a standard set for noise. When in full operation, unit trains go near my house and many others day in and day out hauling sand. They run day and night without consideration for anyone. Noise is heavy. In my neighborhood alone, there are many intersections. I have heard the whistle or horn blow over 20 times each time they go through here. It is not only the sounding of the horn but the vibrations felt by many as they go through the area. I live about a block and ½ from the rail but know some who are within 150' of the rail. As mining facilities to the north are developed, more and more unit trains will come through here (100-140 cars have been seen here at one time). Shouldn't there be a limit on the number of mines to the north so that we do not have to be bothered every day and night with this heavy industrial component added to city life?
10. The report indicates that the Tunnel City formation is not being used for fracking. However, EOG managers have stated that they thought it was waste sand until they found it produced a better frack than other formations because it is fine and larger quantities can produce a better well. They have dug up their stores of Tunnel City and used it. If there are sulfides in that formation, one can only imagine what the impacts could be on heavy metals leaching out into the water supply.
11. Not all of the states using hydraulic fracturing are mentioned. I understand that 34 states are involved in fracking. More research on this data needs to be done.
12. The report indicates that minimal damage has been done to roads. Crews have been working on Highway 53 all summer. Some work has had to be redone for whatever reason. Lots of sand trucks travel that highway and yet no mention is made of the construction zones that go on for miles in that stretch near Bloomer.

13. There are many examples in the report that state rules and regulations and expectations. In MN, they have developed a ruling that says no sand operation will be built within 1000' feet of a trout stream. Yet, just recently the WDNR approved the filling in of a wetland located at the headwaters of Duncan Creek to build a processing plant and a rail load out facility allowing a 150 unit cars to go in and out of the headwaters water rich area. Can you imagine the chemicals and silica coming off those railroad cars as well as the processing facility? There is a great deal of conflict in what is said and what is done in this State. Millions of dollars have been spent on the fishery over the years (it is the home of native brook trout and many have been transported to other state streams for repopulating dead streams); many communities down stream will be affected. Millions of dollars are being spent in Chippewa Falls on a Riverfront park where the Duncan and Chippewa River meet. Yet, a sand processing plant and a rail-load out facility take precedence over protecting the Duncan Creek? Makes no sense whatsoever! There are many lessons to be learned from the McKeesey Marsh episodes and they should be recalled before additional problems occur at the Duncan site in northern Chippewa Co.
14. What is a tourist? Are they local people looking over the devastation? Granted there have been many who have come to see it. They have not come here to have fun! I believe that the tourist industry would like to have people believe that we have much more tourism in this area. How are the tourism statistics been derived?
15. The report is filled with lots of misconceptions, the word "should" is used excessively; the report inadequately spells how the volume of considerations that must be given to this industry which affects many people and other industries beyond the scope of understanding. After all reports are received, the state should call a **moratorium on the permitting of any future facilities related to this industry** until it has thoroughly vetting out all of the components and involvement of all the factors involved. The Wisconsin Conservation Congress voted to do so at their spring meeting with all counties reported as every portions of this state is affected in some way. Pollution knows no boundaries in the frac sand

industry and it is clearly evident that more scientific research, more communication about the impacts of the industry, and more specifics dealing with enforcement, the expenses that citizens will have to incur as companies fail on reclamation, along with the damages to our endangered species, animal populations, and human populations must be studied and shared. It is a no brainer given this report. Let's look at the components and involve citizens this time around.

There is much more to be said but there are time limitations. I have read the entire report; while I am certain much time and effort has gone into making this a good report, there are many issues unresolved or not even reported. If you wish to discuss any of the above with me, feel free to give me a call.

[redacted]

August 22, 2016

WE CAN'T RELY ON THE INDUSTRY TO APPLY EVEN THE MOST SIMPLE OF BEST MANAGEMENT PRACTICES REGARDING DUST CONTROL METHODS. WATER CAN'T BE APPLIED IN THE WINTER DUE TO THE FREEZING OF WATER; THEREFORE CITIZENS ARE AT THE MERCY OF THE INDUSTRY! IT IS DISPICABLE THAT IN THIS MODERN DAY OF EDUCATED PEOPLE WITH A CONSCIENCE THAT THESE PRACTICES CAN BE CONDONED. THE FACT IS THAT WE ARE PERMITTING CRIMINAL BEHAVIOR THROUGHOUT THIS STATE. WE KNOW THAT THE MATERIAL BEING MINED IS CARCINOGENIC!! PEOPLE ARE INJURED! AND THERE ARE NO APPROPRIATE MEASURES BEING TAKEN TO ASSURE PEOPLE THEY ARE SAFE NEAR THE WORK OF AN INDUSTRY THAT HAS NOT SHARED ANY DATA TO PROVE OTHERWISE (EXCEPT PERHAPS PROPAGANDA!)

August 22, 2016

VIA E-MAIL ONLY

ISM SA Coordinator – DNRISMSA@wisconsin.gov
WDNR OB/7
P.O. Box 7921
Madison, WI 53707-7921

RE: Comments to the Draft Industrial Sand Mining Strategic Analysis

Dear ISM SA Coordinator:

Wisconsin Infrastructure Investment Now, Inc. (WIIN) is a nonprofit organization, and its mission is to educate the public, elected officials and regulators on the societal and economic benefits of the responsible investment in, and expansion of, transportation facilities, renewable and traditional energy projects, mining and other infrastructure projects. WIIN has reviewed the Draft Industrial Sand Mining Strategic Analysis (Draft ISM Strategic Assessment) and appreciates the opportunity to submit comments.

WIIN appreciates that the Department only used data collected with scientifically-accepted, reliable equipment and testing methodologies and primarily only relied upon peer-reviewed studies to reach its conclusions. It is imperative that as the ISM industry continues to mature in Wisconsin, regulators take balanced, unbiased and responsible approaches to industry analyses. The Draft ISM Strategic Assessment was clearly one such balanced, unbiased and responsible industry analysis. WIIN thanks the Department and all staff who contributed to the product.

As a whole, WIIN believes that the Draft ISM Strategic Assessment is thorough and contains robust analyses, but WIIN would like to provide additional information or comments on a few sections.

Section 2.3.17 Current Trends (Groundwater)

The section accurately summarizes ISM groundwater withdrawals. However, the total gallons withdrawn and the increase in withdrawals over the last several years for the ISM industry should also be analyzed in relation to all industrial groundwater use so as to provide perspective on the statewide impact of the ISM groundwater use.

According to the Department's Wisconsin Water Use, 2014 Withdrawal Summary,[1] the total amount of groundwater used by all industries in 2014 was 224 billion gallons. According to the data in the Draft ISM Strategic Assessment, the ISM industry accounted for 1.8 billion gallons of groundwater use in 2014, or 0.8% of all groundwater used in the state. Therefore, while the ISM industry's groundwater use has increased, the percentage of groundwater use on a statewide basis across all industries remains very small, under 1%.

Section 3.2.1 Local Roads

The Draft ISM Strategic Assessment provides that Wis. Stat. § 349.16 allows local units of government to require ISM owners to enter into "road upgrade maintenance agreements" or RUMA's. WIIN respectfully disagrees with the Department's summary of Wis. Stat. § 349.16.

In general, a local unit of government must maintain its roads sufficient to withstand Class B weight limit traffic and is prohibited from permanently restricting traffic to less than Class B weight limits. *See* Wis. Stat. §§ 348.15-.16; 66 Op. Att'y Gen. 110, 111 (1977) (concluding Wis. Stat. §§ 349.15 and 349.16 did not authorize a county to permanently prohibit truck traffic from a highway or permanently limit the truck traffic to less than Class B weight limits); 39 Op. Att'y Gen. 446, 447 (1950) (concluding the Wisconsin legislature intended to set up minimum highway standards, unify and modernize the highway system and remove "a hodgepodge of confusing local rules and restrictions"). Under limited circumstances, a private party may be liable for damage to local roads. Pursuant to Wis. Stat. § 349.16(1)(c), a local unit of government may order a private entity to suspend use of a local road but only if the person is "causing or likely to cause" damage to the roads and only if there is no agreement in place that will ***reimburse*** the local unit of government for the damage done to the roads. Nothing in Wis. Stat. § 349.16 authorizes a local unit of government to condition use of local roads upon entering into an extensive RUMA, such as the Chippewa County example cited in the Draft ISM Strategic Assessment.

WIIN believes ISM owners should assess their impact on local roads and responsibly respond to the legitimate concerns that truck traffic, particularly overweight truck traffic, is causing local roads to deteriorate faster than they would have absent the ISM. However, a recent study released by the U.S. Department of Transportation found that 71% of Wisconsin's roads are in poor or mediocre condition and 14% of Wisconsin's bridges are structurally deficient or

[1] Wisconsin Water Use, 2014 Withdrawal Summary, available at http://dnr.wi.gov/topic/WaterUse/documents/WithdrawalReportDetail.pdf (last visited August 17, 2016).

functionally obsolete.[2] The American Society of Civil Engineers' (ASCE) most recent report card gave road quality in the United States a "D" grade.[3] The Wisconsin Taxpayer Alliance's report card rated Wisconsin's highway condition as a "D."[4] A recent analysis by the Wisconsin County Highway Association supports the findings of the U.S. DOT, the ASCE and the Wisconsin Taxpayer Alliance.[5]

The ISM industry did not cause the current transportation crisis in Wisconsin. Yet, in many instances, ISM owners are shouldering far more than their fair share of the cost of infrastructure improvements. While individual ISM owners appear to have successfully negotiated voluntary agreements with local units of government, WIIN cautions the Department against suggesting that local units of government have the legal right to obligate anyone to enter into a RUMA as a condition of using local roads.

3.5 Property Values

In the Property Values section, the Department states: "Property values on adjacent residential parcels may decrease due to proximity to the mine operation and associated concerns about noise, traffic, air quality, surface water and groundwater quality, viewscape, etc." The Department does not cite to any source for this conclusion.

WIIN is aware that anti-mining activists routinely claim property values decrease due to ISM's. However, "repeating an unsupported statement often and loud does not make it true."[6] A recent policy study by The Heartland Institute summarized the available studies on the effect of nonmetallic mining on property values. The Heartland Institute's review of the available literature concluded: "There are ***no credible studies*** supporting claims of widespread and predictable property value declines associated with industrial sand mining or any other similar nonmetallic mining activity."[7] The Heartland Institute further summarized the credible, peer

[2] U.S. DOT Road and Bridge Data by State, available at https://www.transportation.gov/policy-initiatives/grow-america/road-and-bridge-data-state (last visited April 12, 2016).

[3] American Society of Civil Engineers, 2013 Report Card for America's Infrastructure, available at http://www.infrastructurereportcard.org/ (last visited April 12, 2016).

[4] Wisconsin Taxpayers Alliance 2015 Report Card, available at http://cdn.p2a.co/49430/HmTowho4iN1452717209QWEZmeJ2G3 (last visited April 12, 2016).

[5] *See* WCA and WCHA Respond to Wisconsin Department of Transportation Comments on Statewide Road Conditions (March 17, 2016), available at http://www.thewheelerreport.com/wheeler_docs/files/0317wcha.pdf (last visited April 12, 2016).

[6] Social Impacts of Industrial Silica Sand (Frac Sand) Mining: Land Use and Value, The Heartland Institute, at p. 24 (Feb. 2016), available at https://www.heartland.org/publications-resources/publications/social-impacts-of-industrial-silica-sand-frac-sand-mining-land-use-and-value (last visiting August 18, 2016).

[7] *Id.* (emphasis added).

reviewed studies as follows: "Between 1981 and 2011, several studies, using technically sound methods, examined the relationship between nonmetallic mining and property values. Each of the studies concluded there was no consistent relationship between mines and property values."[8]

In closing, WIIN appreciates the opportunity to provide comments on the Draft ISM Strategic Assessment. If the Department has any questions concerning WIIN's submission, please contact me at your convenience.

Sincerely yours,

/s/ Terry McGowan

Terry McGowan
President

[8] *Id.* (emphasis added).

WMC
WISCONSIN MANUFACTURERS & COMMERCE

August 22, 2016

ISM SA Coordinator
Wisconsin Department of Natural Resources
OB/7, P.O. Box 7921
Madison, WI 53707-7921

Via Electronic Mail Only To:
DNRISMSA@wisconsin.gov

RE: Comments Industrial Sand Mining Strategic Analysis

To Whom It May Concern:

On behalf of Wisconsin Manufacturers & Commerce (WMC), thank you for the opportunity to submit comments on the Department of Natural Resources' (DNR) draft Strategic Analysis of Industrial Sand Mining in Wisconsin.

WMC is Wisconsin's chamber of commerce and manufacturers' association with nearly 4,000 members statewide of all sizes and across all sectors of Wisconsin's economy. WMC's membership includes not only industrial sand mining and processing companies but also a significant number of companies in related industries. These industries include equipment manufacturers and servicers, retailers, and transportation companies, as well as companies that utilize industrial sand as an important resource in their day to day operations such as glass makers, foundries, chemical manufacturers, petroleum companies, and others. Industrial sand mining is an industry with a tremendously wide reach throughout our state's economy.

Industrial sand has been safely mined in Wisconsin for more than a century. This heavily regulated industry provides tremendous benefits to our state not only by producing vital resource relied upon by a variety of industries, but also for the economic benefits that industrial sand mining and processing facilities bring to the communities in which they operate. WMC and our member companies appreciate the opportunity to discuss the many benefits that this industry brings to our state, and the importance of this vital resource to our economy. Thank you to DNR staff for the significant time that has been invested into producing this draft analysis. We respectfully submit the following comments for your consideration:

Executive Summary

- Page ii, "Air Quality": this section states "There is not currently a federal standard or federally approved monitoring method for crystalline silica." This statement would more accurately be stated as "non-occupational exposures to" crystalline silica, and should be updated accordingly.

- Page v, "Visual and Auditory": this section states that regulation of impacts due to light and noise are not under DNR jurisdiction." This is true, and it should be made clear in other areas throughout the document where particular sections are not under DNR jurisdiction (for example: property values).

Section 1

- Section 1.2 "Current Sand Mining" includes a description of Hydraulic Fracturing as a subsection. The analysis should contain a greater explanation of the many additional industries that rely upon industrial sand for their operations on a daily basis (foundries, glass makers, chemical manufacturing, agriculture, etc.) and do a better job of making clear that industrial sand mining has been occurring in Wisconsin safely for more than a century, and the sand used in hydraulic fracturing is the same sand utilized by these vital Wisconsin industries.
- Section 1.2.2 could more clearly state that no hydraulic fracturing is occurring in the state of Wisconsin – the current wording is confusing (last line of page 1-2), here again it could be noted that while no hydraulic fracturing is occurring in Wisconsin a variety of industries utilize industrial sand as a resource in their businesses.
- Section 1.2.4 should more clearly state that while a mine site may be permitted for a certain amount of acreage, the active mine itself would only consist of a small portion of that acreage.

Section 2

- Section 2.1, "Air Quality" states that sand has been mined in Wisconsin for decades – using a phrase like "more than a century" here would be a more accurate descriptor. This section should also make clear that for the overwhelming majority of the more than 100 year history of sand mining in Wisconsin, air quality has not been a concern. Our members place a high priority on environmental quality and ensuring safe and efficient mining operations, this section should note that a variety of studies have found the air quality around sand mines to be safe.
- Section 2.1.1, "Air Pollutants" discusses particulate matter (PM). We agree with the conclusion that industrial sand facilities do not emit PM 2.5.
- Industrial sand mining is a heavily regulated and safe industry, the analysis does a good job of laying out the many layers of extensive regulations that the industry works under. This section could also include more data and discussion about the air quality trends in Wisconsin, and particularly in western Wisconsin.
- Section 2.1.3, "Air Regulations": under "Blasting" on page 2-26 it reads: "Allowable fugitive dust emissions from blasting are covered by the facility's air management permit issued by the DNR and are limited to 10% opacity." Under NR 431, the opacity standard is 20%.
- Section 2.1.3, "Air Regulations": under "Crushers" on page 2-27, the draft states: "The standard limits particulate concentrations in the air to 15% opacity." EPA's NSPS limit opacity from crushers to 15% if constructed before April 22, 2008, and to 12% if constructed after April 22, 2008. The applicable standard discussion in the analysis should be updated to reflect the two standards.

- Section 2.1.9, "Impacts on Air Quality and Health": We agree with the conclusion that "the industrial sand mine industry is not expected to have significant impacts on air quality" on page 2-36.
- As a general comment, section 2 of the draft analysis also needs to be updated in various places to reflect the significance of the reclamation process once a mine site has been closed. Companies go to great lengths to ensure the land is returned to a useable state that will continue to be a benefit to the local community, and although this analysis includes a section on reclamation – it could be expanded.

Section 3

- WMC continues to question whether DNR is the appropriate entity to study and report on several of the socioeconomic topics contained in this analysis.
- Section 3.4, "Local and state economy": Industrial sand companies make significant investments in the communities in which they operate. Many companies go well above and beyond to help contribute to their local communities. This section needs to be expanded to go into greater detail on the economic benefits of industrial sand mining at both the local and state level.
- This section should include more information and data regarding unemployment rates, and increased local revenues including account royalties, severance fees, road use fees, donations, and other payments made to local government units and school districts by industrial sand operators.
- This section also needs to note again the many other industries throughout the state that rely upon the resources produced by the industrial sand industry.

Section 4

- Section 4.1.9, "Other Local Ordinances and Agreements": This section could be improved by adding more data and analysis rather than referring to other resources. Specifically, discussing the state regulatory perspective regarding local governments developing and applying environmental regulations that conflict with or contradict state regulations is certainly within the scope of this analysis, and should be included.

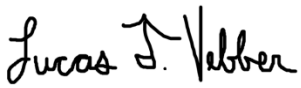
General Comments

- The analysis is very light on citations. WMC and our member companies welcome a rigorous fact-based discussion of the industrial sand industry based on sound science. Throughout this analysis there are conclusory statements made without any citation specifically backing them up. The analysis could be more effective, and will have a greater impact for policy makers and the general public, if it included more concrete citations and references.
- Industrial sand mining is a historic and vital industry to Wisconsin. As noted above, at various points throughout the document it could be much clearer that industrial sand is used by a variety of industries and has many tremendously positive uses.

Again, we appreciate the significant time and effort from DNR staff that has gone into this analysis and we respectfully submit these comments for your consideration. Should DNR staff have any follow up questions or need any additional feedback on this analysis, we would be happy to assist in any way that we can.

Thank you for your time.

Sincerely,



Lucas Vebber
Director, Environmental and Energy Policy
Wisconsin Manufacturers & Commerce

cc: Governor Walker
Secretary Stepp
Senator Tiffany
Representative Kulp

Willger, Christopher J - DNR

From: [redacted]
Sent: Monday, August 22, 2016 5:44 PM
To: DNR ISMSA
Cc: Pierce, Crispin H.
Subject: WRITTEN COMMENTS ON THE "Wisconsin Department of Natural Resources Industrial Sand Mining in Wisconsin Strategic Analysis for Public Review"

[redacted]

ISM SA Coordinator
WDNR OB/7
P.O. Box 7921
Madison, WI 53707-7921
DNRISMSA@wisconsin.gov

22 August 2016

Re: WRITTEN COMMENTS ON THE "Wisconsin Department of Natural Resources Industrial Sand Mining in Wisconsin Strategic Analysis for Public Review"

My name is [redacted], I am an Junior Environmental Public Health major at the University of Wisconsin Eau Claire and have worked with Dr.Pierce for 10 months on his air quality research pertaining to frack sand mine facilities.

In the Strategic Assessment there is a lack of information pertaining to the mine reclamation process (section 4.1.6). There seems to be a large amount of public concern regarding the reclamation process due for these sand mines. Providing enough information regarding legal loopholes that allow sand mining corporations to skirt their responsibility to do right by local residents and the land is imperative.

The permitting program required under Ch. NR 135 Wis. Adm Code should include stricter requirements that companies mining the land will not be allowed to simply disappear once the sand has been mined, and the strategic assessment should make clear in layman's terms what these loopholes are currently.

An un-reclaimed mine is both an eyesore and a local health risk. The risk for local children playing in one of these used up mines is a danger that comes to mind. Sand mining companies should provide all the necessary assurances to make sure there are no ethical concerns when dealing with the reclamation of the land, and the public should be given a better understanding of what actually is done to hold corporations responsible.

Sincerely,
[redacted]

Willger, Christopher J - DNR

From: [redacted]
Sent: Monday, August 22, 2016 4:51 PM
To: DNR ISMSA
Cc: Pierce, Crispin H.
Subject: WRITTEN COMMENTS ON THE "Wisconsin Department of Natural Resources Industrial Sand Mining in Wisconsin Strategic Analysis for Public Review"

[redacted]

[redacted]

[redacted]

ISM SA Coordinator
WDNR OB/7
P.O. Box 7921
Madison, WI 53707-7921

My name is [redacted], and I am a recent graduate of the University of Wisconsin Eau Claire. I graduated with a comprehensive degree in Environmental Geography, and have been working on research regarding frac sand mining through the UWEC Environmental Health dept. since my graduation in May.

There are a few comments that I would like to make regarding the latest draft of the Industrial Sand Mining Strategic Analysis. First is that I would like to stress how helpful visual aids such as pictures, charts, figures, and representations are to readers who are unfamiliar with academic writing. If the goal of the analysis is to educate the public, then the diction of the analysis should be written at a level where anybody can read it and understand it. I am aware that in many cases it is not possible to write in layman's terms without losing some of the significance, which is where visual aids could be very helpful. The sentence regarding dewatering on page 1-14 of the report is a good example of this academic writing style "*Dewatering is the surface or subsurface mechanical removal and relocation of water from a working area or proximity to facilitate the operation of excavation equipment, other machinery, or processes*." Although the sentence holds a lot of important information, it is very hard to understand.

The next thing I would like to bring to attention is the fact that there are too few mines that are reporting air quality levels to the DNR. The analysis states "*that sixteen facilities have operated a total of 18 PM10 monitors"* (2-33). The analysis also states that there are 92 active facilities on page 1-6. Assuming the monitors

are reporting at active sites, it means that only 17% of mining operations are being monitored. This correlates to 83% of mines not reporting data. It worries me that a lot of data collected by the DNR may not accurately represent actual values, because the majority of the mines are not included in reporting. Efforts should be made to increase the accountability of active sites by requiring reports of air quality. Wisconsin exports more silica sand than any other state in the country, so it only makes sense that we have regulations to keep the public safe from potential health risks.

Finally I would like to stress the importance of closing loop holes that allow mining companies to thwart their responsibilities to reclaiming the land after mining operations have ceased. At the DNR public hearing in Eau Claire WI on July 26th, many of the people that spoke were concerned that insurance loopholes should be closed so companies would be obligated to reclaim mined land. I agree with these statements because once the land is reclaimed it can be used for other things. The land will be more aesthetically pleasing, have less of an impact on the local environment, and is the ethical choice.

I'd like to thank the Wisconsin DNR for holding the Public Hearing in Eau Claire on July 26th, and for accepting comments from the public.

Sincerely,

[redacted]

August 24, 2016

Industrial Sand Mining Strategic Analysis Coordinator
(By E-Mail to DNRISMA@wisconsin.gov)
Department of Natural Resources, OB/7
P.O. Box 7921
Madison, WI 53707-7921

SUBJECT: Comments on "Industrial Sand Mining in Wisconsin, Strategic Analysis for Public Review"

Dear ISMSA Strategic Analysis Coordinator:

The member companies of the Wisconsin Transportation Builders Association (WTBA) have a long history supporting the state and regional economy through responsible nonmetallic mining of industrial sand and construction sand and gravel.

WTBA has reviewed the June 2016 draft Strategic Analysis of Industrial Sand Mining in Wisconsin. The document provides a comprehensive overview of the environmental issues and the regulatory framework of the nonmetallic mining generally and industrial sand mining in particular.

We particularly wanted to support the draft report's observations related air impacts and particulate matter monitoring. Several are worth highlighting here.

On ambient air dispersion modeling related to PM_{10}:

> Analyses of PM_{10} impacts of ISM and processing facilities shows that the impact of a facility decreases quickly with distance, dissipating within 0.3-1.0 kilometers from the sources. *This means that it is unlikely that PM_{10} levels near these facilities are significantly greater than general background levels.*[1]

On facility monitoring of PM_4/Crystalline Silica, which included studies supported, in part, by a WTBA member company:

> Facility-sponsored studies indicate that industrial sand mine contribution to crystalline silica concentrations in the ambient air are minimal . . . . The studies also indicate that crystalline silica levels are not significantly different up wind reverses downwind of the facilities when samples were

[1] Wisconsin Department of Natural Resources, "Industrial Sand Mining in Wisconsin, Strategic Analysis for Public Review," June 2016, p. 2-32 (emphasis added).

> collected simultaneously. *This suggests that the contribution of crystalline silica to ambient air concentrations by industrial sand facilities is minimal*.[2]

On recent trends in monitoring activities involving industrial sand mine operations:

> Overall, monitoring near sand mines has consistently shown ambient levels of PM_{10} to be well below the federal PM_{10} ambient air quality standard, and has not identified any ambient monitored values above the standard that can be attributed to industrial sand mine operations.[3]

On impacts to air quality and health in the current regulatory schemes:

> As a result of existing regulations in the permitting and compliance activities described above, health related impacts from industrial sand facilities are not likely to be an issue.[4]

WTBA would also like to encourage and support nonmetallic mining regulatory schemes that differentiate between industrial sand facilities and activities and traditional sand and gravel facilities/activities. (See pp. 2-51 to 2-53). The report references that the department is proposing to reissue nonmetallic mining operations general permit as two general permits—one applicable to traditional sand and gravel type operations and one applicable to industrial sand facilities. We hope this will lead to less onerous regulation of sand and gravel operations but that are still protective of the environment.

Thank you for providing the opportunity to comment.

Please let me know if WTBA can be of any assistance as you complete the strategic analysis over the coming year. Thank you for your consideration.

Sincerely,

Patrick Goss
Executive Director

cc: Dave Siebert (by e-mail)

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[2] Wisconsin DNR, ISM Strategic Analysis, p. 2-34 (emphasis added).
[3] Wisconsin DNR, ISM Strategic Analysis, p. 2-35.
[4] Wisconsin DNR, ISM Strategic Analysis, p. 2-36.

July 26, 2016

ISM SA Coordinator,
WDNR OB/7,
P.O. Box 7921,
Madison, WI 53707-7921

RE: Public input on the Wis DNR Industrial Sand Mining in WI Strategic Analysis

My name is [redacted]. **I am here to discuss the legal LOOPHOLE which shifts the mine reclamation costs from the mining companies, to the County taxpayers.**

Since this topic is very technical, I need to explain the term: **Financial Assurance.**

In basic terms, Financial Assurance (FA) is a guarantee from an Insurance Company or Bank, that guarantees that a Mining Company, will reclamation the property. (Page 15 of 16). So if a mining company goes broke, the Insurance Company or Bank pays the County, for the reclamation costs. (The FA could be a bond, Letter of Credit, cash, etc. (Page 16 of 17))

Financial Assurance (FA), is basically the same thing as a parent co-signing a car loan for their kid. By co-signing, the parent is "guaranteeing" that if the kid does not pay the loan, they will.

The LOOPHOLE has two parts:

1. The Insurance Company or Bank can avoid paying any Financial Assurance (FA) money to the County, by mailing a 90 day notice of cancellation (Page 8 of 16, NR135.40(9)).

2. The law makes it is impossible for the County to collect any Financial Assurance (FA) money, during the 90 day notice of cancellation period (Page 8 of 17, NR135.40(8)).

Section 2.10.3 of this document, (Reclamation Processes and Standards) states:

> *"Implementation of the reclamation plan is enforceable by the RA(County) and guaranteed through the posting of a financial assurance instrument payable exclusively to the county."* (Page 4 of 17)
>
> **However, this is a WORTHLESS GUARANTEE since it has a 90 day cancellation provision.**

For Example: In Eau Claire County, the Augusta Hi-Crush Mine (Page 9 of 16) "halted work" and stopped shipping sand in February 2016, which is about five months or about 150 days ago., (Pages 17 of 17). There has been no indication when their operation will resume. (Page 10 of 17). Their Financial Assurance (FA), in excess of $1 million, includes a 90 day notice of cancellation provision. They have not "ceased or shut down" their operation, instead, they have "halted' or temporarily closed their operation.

According to NR135, **in order to collect the Financial Assurance** (FA) that is being cancelled, the County must do one of the following two things during that 90 day cancellation period (Page 8 of 17, NR135.40(8)): (However, in actuality, the County only has 30 days to do the following (Page 6 of 17, NR135.40(9)))

1. Revoke the mine operator's permit and complete the Appeal process for the revocation of the permit (Page 8 of 17, NR135.40(8)(a)). (It is highly unlikely that this will happen in 30 days)

2. Prove that the mine operator has "ceased operations" **AND** "failed to reclaim" the mine site (Page 8 of 17, NR135.40(8)(b)). (It is highly unlikely that this will happen in 30 days) In the case of the Augusta mine example, this will never happen because:

    i. They have not shut down and they are not required to reclaim the property until AFTER they have shut down.

To solve this 90 day cancellation loophole, the only option that guarantees that the reclamation funds are available to the County, is to require an up front CASH Deposit equal to the reclamation amount (Page 16 of 17).

In Conclusion:
The following statement should be added to section 2.10.3 of this document.

> ***Of the various Financial Assurance (FA) options available,*** *(Bond, Letter of Credit, Cash, etc (page 16-17 of 17))* ***an up front "Cash" deposit is the only option, that will provide the County with a 100% guarantee that the reclamation funds will be available, when the mining operation ceases*** *(Page 16 of 17).*

By adding this statement, the burden for the mine reclamation costs, transfers, from the County taxpayers to the mining companies.

Thank you for your consideration.

[redacted]
Fall Creek WI 54742
[redacted]

==========

Actual timeline for the 90 day cancellation period:

The steps to be taken by the County in order to collect a Financial Assurance (FA) if the Bank or Bonding company issues a 90 day notice of cancellation:

1. Day 1- Day 60 of the Cancellation period: A replacement FA must be received by the County. (Page 8 of 17, NR135.40(9)) County cannot collect from the FA since the operator has FA for 30 more days.

2. Day 61-Day 90 of the Cancellation period:
    a. If no replacement FA, all mining operations cease. (Page 8 of 17, NR135.40(9))
    b. The County Can Revoke the Operators Permit: (Page 7 of 17, NR135.25(3))
    c. Before the County can collect on the FA, the operator can appeal the Revocation of their reclamation permit. (This appeal must be completed before the 90 day cancellation period ends. (Page 8 of 17, NR135.40(8)(a)) or
    d. The County has to prove that the operator has ceased operations AND fails to reclaim. This is impossible since they have not "ceased' operation, they have "halted" operation. (Page 8 of 17, NR135.40(8)(b))

Wisconsin Department of Natural Resources
Industrial Sand Mining in Wisconsin

Strategic Analysis for Public Review

June 2016

invasive cover crops and species known to not be invasive. Mulch should be weed-free. Once reclamation is completed, local monitoring to detect and remove invasives will prevent establishment of the unwanted species.

Aquatic Invasive Species (AIS)

ISM process facilities may include the construction of surface water ponds and waterways that may store or convey stormwater or industrial process water. Waterways may be constructed that connect and discharge stormwater or process water to natural streams. To date, ISM process facilities or mine sites have not been located on flow through stream systems.

These facilities provide potential habitat for aquatic invasive species. The value or suitability of the habitat created can vary greatly. The risk of introduction of non-native and invasive species into these ponds and waterways is considered low, in part because general public access is prohibited.

Mine sites that are dewatered during the mining season provide poor habitat for both native and non-native species since the pond or lake is dry for nine or more months out of the year. The mine sites that hydraulic dredge material, resulting in a permanent waterbody, provide potential habitat for both native and non-native vertebrate and invertebrate species. During active mining operations, mechanical and flow disturbances within the pond/lake will likely restrict the survival of non-native species. In some instances the reclamation plan shows these larger water bodies will be managed as natural lakes with created littoral zones, public access and shoreline develop and public parks. These larger ponds and lakes could provide suitable habitat for the introduction and survival of invasive species. Introductions could occur through natural vectors (*e.g.* birds, *etc.*) or by humans if public or private access exists.

Management to Decrease Potential Environmental Effects

State waterway and wetland permits include conditions that require construction machinery to be decontaminated and inspected for invasive species. ISM companies could put in place similar conditions for contractor work and their own machinery that operates within ponds and waterways on their property. Lakes and larger ponds proposed as part of the final reclamation plans could include an invasive species monitoring and management plan. A targeted public information and education program could help prevent the introduction and spread of invasive species.

All prohibited species should be reported to Invasive.Species@wi.gov

2.10 Reclamation

The reclamation regulations are established by the State and administered by a county or municipality as approved by the DNR.

2.10.1 Permits, Fees, and Financial Assurance

NR 135 requires reclamation of nonmetallic mining sites. All active mines must have valid reclamation permits, issued by the regulatory authority (RA) with jurisdiction for the mine site, unless exempt from NR 135. New mines must apply for and receive a reclamation permit prior to beginning operations. The rules provide reasonable

exemptions, such as for sites less than one acre, a pit on a farmer's land for personal use or excavations incidental to building construction.

A reclamation plan is the basis for granting a reclamation permit. It is a blueprint describing the steps that are necessary to reclaim the site to achieve a post-mining land use. The reclamation plan must demonstrate compliance with the uniform reclamation standards provided in NR 135 and provides environmental protection during and after the mining process.

RAs are responsible for permitting and overseeing the reclamation of nonmetallic mining sites within their jurisdiction, including reviewing mine operators' reclamation plans. The reclamation permit application requires the mine operator to submit information regarding land ownership or leasing information, mine location and description, the first year's annual fees, and a complete reclamation plan. The permit, once approved, also requires operators to provide financial assurance in an amount sufficient for the RA to reclaim the mine in the event that the operator is unable to do so. The reclamation permit, a complete reclamation plan, and financial assurance must all be in place prior to the commencement of mining.

RAs administering NR 135 reclamation programs may set and collect annual reclamation fees on unreclaimed acres of active mining operations. By law, the RA administering a nonmetallic mining reclamation program sets and collects fees from mine operators that represent, as closely as possible, their administrative costs. These costs include permitting, plan review, and administrative and inspection costs. The RA also forwards a portion of the fees to the DNR to cover statewide administrative costs.

RAs are responsible for transferring fees and providing reports to the DNR's Nonmetallic Mining Program. These fees allow the DNR to provide technical assistance and oversight to these programs, including periodic audits to ensure they are administering reclamation programs in a consistent and reasonable manner across the state.

2.10.2 Cross-Programmatic Jurisdictions

Under s. NR 135.06(5): *Reclamation of nonmetallic mining sites shall comply with any other applicable federal, state and local laws including those related to environmental protection, zoning and land use control.*

Multiple DNR programs may cover elements of mine site reclamation. Examples include the Stormwater Management Program which requires that all nonmetallic mines have a Wisconsin Pollutant Discharge Elimination System (WPDES) permit in place through the lifetime of the mine, and the Waterways and Wetlands program which permits operations with proposed waterway dredging activities, grading, or the construction of ponds in close proximity to waterways under Ch. NR 340, Wis. Adm. Code.

Where zoning has been adopted at the county or local level, zoning administrators are responsible for all mine siting requirements, including the issuance of zoning Conditional Use Permits and the regulation of operations. When zoning is in place, these bodies may also be responsible for regulating reclamation activities. See also section 4.1.3.

2.10.3 Reclamation Processes and Standards

Reclamation may occur contemporaneously with the development of new mining phases, especially in large surface mining projects, or upon the cessation of mining operations. In either case, reclamation proceeds according to an approved reclamation plan developed to achieve a specific post mining land use. Implementation of the reclamation plan is enforceable by the RA and guaranteed through the positing of a financial assurance instrument payable exclusively to the county.

RAs are responsible for the review and approval of reclamation plans for mine sites in their jurisdiction, and for ensuring that mine operators adhere to those reclamation plans. The purpose of the reclamation plan is to achieve acceptable final site reclamation to an approved post-mining land use in compliance with the uniform reclamation standards outlined in NR 135. The reclamation standards address environmental protection measures including topsoil salvage and storage, surface and groundwater protection, final grading and slopes, and contemporaneous reclamation to minimize the acreage exposed to wind and water erosion.

Because sand mines are designed to be mined and reclaimed in phases, contemporaneous reclamation is required to be undertaken to minimize the acreage that is open. Once the supply of sand at the mine site has been exhausted, the mine owner/permittee is required to reclaim the mine area. The RA administers mine reclamation where the mine is located. There is some variation in what counties require for reclamation, but generally the site will be graded so that slopes do not exceed a 3:1 slope gradient. This generally applies to slopes that will receive topsoil or substitute plant growth material but steeper slopes may be approved by the RA based on test plots or other justification. Vertical or near vertical highwalls may be approved by the county RA, if engineering shows it to be safe and stable, or if the highwall was in existence before NR 135 came into effect. Once grading is complete the site will have topsoil applied, and then be seeded and mulched.

Common post-mining land uses include:

- Passive wildlife habitat
- Lakes or ponds
- Agriculture and silviculture
- Industrial development
- Recreation facilities

2.10.4 Monitoring

Although NR 135 does not prescribe monitoring requirements for nonmetallic mining sites, sections NR 135.07 and NR 135.08 require that surface water quality standards detailed in chapters NR 102 through 105, Wis. Adm. Code, and groundwater quality standards detailed in Ch. NR 140, Wis. Adm. Code standards are not exceeded.

Chapter NR 135

NONMETALLIC MINING RECLAMATION

Subchapter I — General Provisions

NR 135.01 Purpose and scope. (1) PURPOSE. The purpose of this chapter is to require reclamation of nonmetallic mining sites. The rule is promulgated pursuant to ch. 295, subch. I, Stats. The goals of reclamation are:

(a) To rehabilitate sites where nonmetallic mining takes place after the effective date of an applicable reclamation ordinance, in order to promote the removal or reuse of nonmetallic mining refuse, removal of roads no longer in use, grading of the nonmetallic mining site, replacement of topsoil, stabilization of soil conditions, establishment of vegetative cover, control of surface water flow and groundwater withdrawal, prevention of environmental pollution, development and reclamation of existing nonmetallic mining sites, and development and restoration of plant, fish and wildlife habitat if needed to comply with an approved reclamation plan.

(b) To assure nonmetallic mining operations after the effective date of an applicable reclamation ordinance are conducted in a manner that promotes successful reclamation consistent with the standards established in this chapter, minimizes the cost of nonmetallic mining reclamation, encourages the development and reclamation of existing nonmetallic mining sites and, to the extent practicable, minimizes areas disturbed by nonmetallic mining at any time and provides for contemporaneous nonmetallic mining reclamation.

(2) SCOPE. To accomplish these goals, this chapter establishes standards for reclaiming nonmetallic sites, sets out nonmetallic mining reclamation permit requirements, defines procedures and requirements applicable to mines subject to this chapter, defines procedures for administering nonmetallic mining reclamation programs, including the exercise of the department's authority for inspection, review and enforcement, and establishes a procedure for landowners to register marketable nonmetallic mineral deposits in order to preserve these resources.

History: Cr. Register, September, 2000, No. 537, eff. 12-1-00.

NR 135.02 Applicability. This chapter applies to nonmetallic mining sites as follows:

(1) APPLICABILITY. This chapter applies to all nonmetallic mining sites, except as exempted in sub. (3). This chapter does not apply to nonmetallic mining sites where nonmetallic mining permanently ceased before August 1, 2001.

(2) PUBLIC NONMETALLIC MINING. Except as exempted in sub. (3), this chapter applies to nonmetallic mining conducted by or on behalf of the state of Wisconsin, by or on behalf of a county, municipality, or for the benefit or use of the state or any state agency, board, commission or department, except that the financial assurance requirements of s. NR 135.40 do not apply to nonmetallic mining conducted by the state, a state agency, board, commission or department, county or a municipality.

(3) EXEMPT ACTIVITIES. Except as provided in sub. (4), this chapter does not apply to any of the following activities:

(a) Nonmetallic mining at a site or that portion of a site that is subject to permit and reclamation requirements of the department under s. 30.19, 30.195 or 30.20, Stats., and complies with ch. NR 340.

issuance specified in s. NR 135.21, if the regulatory authority finds any of the following:

(a) The applicant has, after being given an opportunity to make corrections, failed to provide an adequate permit application, reclamation plan, financial assurance or any other submittal required by this chapter or the applicable reclamation ordinance to the regulatory authority.

(b) The proposed nonmetallic mining site cannot be reclaimed in compliance with the reclamation standards contained in the applicable reclamation ordinance, this chapter or subch. I of ch. 295, Stats.

(c) 1. The applicant, or its agent, principal or predecessor has, during the course of nonmetallic mining in Wisconsin within 10 years of the permit application or modification request being considered shown a pattern of serious violations of this chapter or of federal, state or local environmental laws related to nonmetallic mining reclamation.

2. The following may be considered in making this determination of a pattern of serious violations:

a. Results of judicial or administrative proceedings involving the operator or its agent, principal or predecessor.

b. Suspensions or revocations of nonmetallic mining reclamation permits pursuant to this chapter.

c. Forfeitures of financial assurance.

(d) A denial under this subsection shall be in writing and shall contain documentation of reasons for denial.

(2) A regulatory authority's decision to deny an application to issue a reclamation permit may be reviewed under s. NR 135.30.

History: Cr. Register, September, 2000, No. 537, eff. 12–1–00.

NR 135.23 Automatic permitting and expedited permit review. (1) AUTOMATIC PERMITTING OF BORROW SITES FOR LOCAL TRANSPORTATION PROJECTS. (a) The regulatory authority shall automatically issue an expedited permit under this subsection if the borrow site:

1. Will be opened and reclaimed under contract with a municipality within a period not exceeding 36 months;

2. Is a nonmetallic mine which is intended to provide stone, soil, sand or gravel for the construction, reconstruction, maintenance or repair of a highway, railroad, airport facility or other transportation facility under contract with a municipality;

3. Is regulated and will be reclaimed under contract with a municipality in accordance with the requirements of the department of transportation concerning the restoration of nonmetallic mining sites;

4. Is not a commercial source;

5. Will be constructed, operated and reclaimed in accordance with applicable zoning requirements, if any, and;

6. Is not otherwise exempt from the requirements of this chapter under s. NR 135.02 (3).

(b) The applicant shall notify the regulatory authority of the terms and conditions of the contract with respect to reclamation of the proposed borrow site.

(c) The applicant shall provide evidence to the regulatory authority to show that the borrow site and its reclamation will comply with applicable zoning requirements, if any.

(d) The regulatory authority shall accept the contractual provisions incorporating requirements of the department of transportation in lieu of a reclamation plan under s. NR 135.19.

(e) The regulatory authority shall accept the contractual provisions in lieu of the financial assurance requirements in s. NR 135.40.

(f) The public notice and hearing provisions of s. NR 135.20 do not apply to nonmetallic mining sites that are issued automatic permits under this subsection.

Note: Local public notice and hearing requirements, if any, regarding zoning decisions still apply.

(g) The annual fees under s. NR 135.39 shall apply, however, the regulatory authority may not charge a plan review fee or an expedited plan review fee. Notwithstanding s. NR 135.39 (4) (b) and (c), the total annual fee including the department share shall not exceed the amount in Table 3 of s. NR 135.39.

(h) The regulatory authority shall issue the automatic permit within 7 days of the receipt of a complete application.

(i) If the borrow site is used to concurrently supply materials for other than the local transportation project, the automatic permitting in this subsection still applies provided the site will reclaimed under a contractual obligation with the municipality in accordance with the department of transportation requirements.

(j) Notwithstanding s. NR 135.36, the operator of a borrow site under this subsection is required to submit only the information in an annual report necessary to identify the borrow site and to determine the applicable annual fee.

(2) EXPEDITED PERMITTING. (a) An applicant may request expedited permit review by proceeding in accordance with par. (b) or (c).

(b) An applicant may submit a request for expedited review with payment of the fee required under s. NR 135.39 (4). This request shall state the need for expedited review and the date by which the expedited review is requested.

(c) An applicant may submit a request for an expedited review if the applicant requires a reclamation permit to perform services under contract with a municipality. This request for expedited review shall state the need for expedited review and shall include a copy of the applicable sections of the contract and the date by which the expedited review is requested.

(d) Following receipt of a request under this subsection, the regulatory authority shall inform the applicant of the estimated date for decision on issuance of the permit. If the applicant then elects not to proceed with the expedited review, the fee paid pursuant to par. (b) shall be returned.

(e) The expedited review process may not waive the requirements of this subchapter for public notice and hearing. This section does not impose an obligation upon the regulatory authority to act upon a permit application under this section by a specific date.

History: Cr. Register, September, 2000, No. 537, eff. 12–1–00.

NR 135.24 Permit modification. (1) BY THE REGULATORY AUTHORITY. If a regulatory authority finds that, because of changing conditions, the nonmetallic mining site no longer is in compliance with this chapter or the applicable reclamation ordinance, it shall issue an order modifying the permit in accordance with s. NR 135.43. This modifying order may require the operator to amend or submit new application information, reclamation plan, proof of financial assurance or other information needed to ensure compliance with this chapter or the applicable reclamation ordinance.

(2) BY THE OPERATOR. If an operator desires to modify a nonmetallic mining reclamation permit or reclamation plan, the operator shall submit an application to modify the permit or plan to the regulatory authority. The application shall be subject to the requirements of this subchapter. The regulatory authority that issued the permit shall take action on the application to modify it in accordance with the standards and procedures contained in this subchapter.

(3) REVIEW. All actions by the regulatory authority pursuant to this section may be reviewed under s. NR 135.30.

History: Cr. Register, September, 2000, No. 537, eff. 12–1–00.

NR 135.25 Permit suspension and revocation. (1) GROUNDS. A regulatory authority may suspend or revoke a nonmetallic mining permit issued pursuant to this chapter if it finds that the operator has done any of the following:

(a) Failed to submit a satisfactory reclamation plan within the time frames specified in this subchapter.

(b) Failed to submit or maintain financial assurance as required by this chapter.

(c) Failed on a repetitive and significant basis to follow the approved reclamation plan.

(2) SUSPENSION. If the regulatory authority makes any of the findings in sub. (1), it may suspend a nonmetallic mining reclamation permit for up to 30 days. During the time of suspension, the operator may not conduct nonmetallic mining at the site, except for reclamation or measures to protect human health and the environment as ordered by the regulatory authority pursuant to s. NR 135.43.

(3) REVOCATION. If a regulatory authority makes any of the findings in sub. (1), it may revoke a nonmetallic mining reclamation permit. Upon permit revocation, the operator shall forfeit the financial assurance it has provided pursuant to s. NR 135.40 to the regulatory authority. The regulatory authority may use forfeited financial assurance to reclaim the site to the extent needed to comply with this chapter and the applicable reclamation ordinance.

History: Cr. Register, September, 2000, No. 537, eff. 12–1–00.

NR 135.26 Approval of alternate requirements. **(1)** CRITERIA. A regulatory authority may approve an alternate requirement to the reclamation standards established in this chapter if the operator demonstrates and the regulatory authority finds that all of the following criteria are met:

(a) The nonmetallic mining site, the surrounding property or the mining plan or reclamation plan has a unique characteristic which requires an alternate requirement.

(b) Unnecessary hardship which is peculiar to the nonmetallic mining site or plan will result unless the alternate requirement is approved.

(c) Reclamation in accordance with the proposed alternate requirement will achieve the planned post–mining land use and long term site stability in a manner that will not cause environmental pollution or threaten public health, safety or welfare.

(2) PROCEDURES. (a) An operator who requests an alternate requirement shall submit the request in writing as required in the applicable reclamation ordinance.

(b) If the regulatory authority is a county or municipality, the alternate requirement shall be approved or disapproved as provided in the applicable reclamation ordinance. Approval or disapproval shall be in writing and shall contain documentation of the reasons why the alternate requirement was or was not approved.

(c) If the department is the regulatory authority, the request shall be submitted to the department's bureau of waste management, which shall have authority to approve these requests. Approval or disapproval shall be in writing and shall contain documentation of the reasons why the alternate requirement was or was not approved.

(d) A request for an alternate requirement may be incorporated as part of an application to issue or modify a nonmetallic mining reclamation permit.

(e) An applicable reclamation ordinance may provide opportunity for public informational hearing pursuant to this subchapter prior to the regulatory authority's action on a request for an alternate requirement.

(3) DEPARTMENT REVIEW. (a) The regulatory authority shall submit written notice to the department at least 10 days prior to public hearing pursuant to sub. (2) (e) on the proposed alternate requirement.

(b) If the department determines that the proposed alternate requirement does not comply with the intent of this chapter or the applicable reclamation ordinance, the department may notify the regulatory authority of this determination either prior to or during the public hearing.

(c) The regulatory authority shall submit each written decision on an alternate requirement to the department within 10 days of issuance.

History: Cr. Register, September, 2000, No. 537, eff. 12–1–00.

NR 135.27 Permit duration. A nonmetallic mining reclamation permit issued pursuant to this chapter shall last through the mine's operation and reclamation as described in the approved reclamation plan. If changes occur in the area to be mined, the nature of planned reclamation, or other aspects of mining require that the approved reclamation plan be amended, the operator shall apply for a permit modification pursuant to s. NR 135.24 (2). If the mine operator is not the landowner, the permit duration cannot exceed the duration of the lease unless the lease is renewed or the permit is transferred to a subsequent lessee or the landowner pursuant to s. NR 135.28.

History: Cr. Register, September, 2000, No. 537, eff. 12–1–00.

NR 135.28 Permit transfer. **(1)** A nonmetallic mining permit may be transferred to a new operator upon submittal to the regulatory authority of proof of financial assurance and a certification in writing by the new permit holder that all conditions of the permit will be complied with.

(2) The transfer is not valid until financial assurance has been submitted by the new operator and accepted by the regulatory authority and the regulatory authority makes a written finding that all conditions of the permit will be complied with. The previous operator shall maintain financial assurance until the new operator has received approval and provided the financial assurance under this section.

History: Cr. Register, September, 2000, No. 537, eff. 12–1–00.

NR 135.29 Change of regulatory authority. If there is a change of regulatory authority for a nonmetallic mining site, the site's nonmetallic mining permit shall remain in effect and be enforceable until the permit is modified by the new regulatory authority.

History: Cr. Register, September, 2000, No. 537, eff. 12–1–00.

NR 135.30 Review of permit decision. **(1)** COUNTY OR MUNICIPAL PERMIT DECISION. Notwithstanding ss. 68.001, 68.03 (8) and (9), 68.06 and 68.10 (1) (b), Stats., any person who meets the requirements of s. 227.42 (1), Stats., may obtain a contested case hearing under s. 68.11, Stats., on a county or municipal regulatory authority's decision to issue, deny or modify a nonmetallic mining reclamation permit.

(2) DEPARTMENT PERMIT DECISION. Any person who meets the requirements of s. 227.42 (1), Stats., may seek review of a department decision to issue, deny or modify a nonmetallic mining reclamation permit, where the department administers a nonmetallic mining reclamation program pursuant to s. NR 135.17 (3). This hearing shall be held as a contested case hearing pursuant to ss. 227.42 and 227.43, Stats. The hearing shall be conducted within the county where the nonmetallic mining site is located. Decisions from these hearings are reviewable in court pursuant to ss. 227.52 to 227.59, Stats.

History: Cr. Register, September, 2000, No. 537, eff. 12–1–00.

Subchapter IV — Administration and Enforcement

NR 135.32 Regulatory authorities for administration of a nonmetallic mining reclamation program. **(1)** COUNTIES REQUIRED TO ADMINISTER NONMETALLIC MINING RECLAMATION PROGRAMS. Each county shall enact and administer a nonmetallic reclamation ordinance that complies with this chapter, except as provided in subs. (2), (3) and (4). Counties shall administer them in conformance with this chapter. Within 6 months of the effective date of revisions to this chapter, counties shall amend their ordinances to ensure compliance with this chapter.

(7) REPORT TO NATURAL RESOURCES BOARD. Within 36 months after December 1, 2000, and within each 5–year period thereafter, the department shall submit to the natural resources board a report on whether the nonmetallic mining reclamation revenue, expenditures and fees established by this section and by other regulatory authorities are reasonable. The report shall be prepared in consultation with the nonmetallic mining advisory committee established under s. NR 135.51.

Note: The department intends to continue to consult and seek the advice of representatives of persons affected by the fees established by the department and other regulatory authorities for the purpose of preparing the report to the natural resources board required by this subsection.

History: Cr. Register, September, 2000, No. 537, eff. 12–1–00; CR 06–024: am. (1) (a) 1., (2) to (5) and (7), r. (1) (b), renum. (1) (c) to be (1) (b), cr. (1) (c) Register November 2006 No. 611, eff. 12–1–06.

NR 135.40 Financial assurance. (1) NOTIFICATION. The regulatory authority shall provide written notification to the operator of the amount of financial assurance required under sub. (3).

(2) FILING. Following approval of the nonmetallic reclamation permit, and as a condition of the permit, the operator shall file a financial assurance with the regulatory authority. The financial assurance shall provide that the operator shall faithfully perform all requirements in this chapter, an applicable reclamation ordinance and the reclamation plan. Financial assurance shall be payable exclusively to the regulatory authority that has jurisdiction and who issues the approval for the reclamation plan. In cases where the regulatory authority changes from one jurisdiction to another all financial assurance shall be made payable to the regulatory authority that currently has primary regulatory responsibility in that jurisdiction.

(3) AMOUNT AND DURATION OF FINANCIAL ASSURANCE. The amount of financial assurance shall equal as closely as possible the cost to the regulatory authority of hiring a contractor to complete either final reclamation or progressive reclamation according to the approved reclamation plan. The amount of financial assurance shall be reviewed periodically by the regulatory authority to assure it equals outstanding reclamation costs. Any financial assurance filed with the regulatory authority shall be in an amount equal to the estimated cost to the regulatory authority for reclaiming all sites the operator has under project permits. The regulatory authority may accept a lesser initial amount of financial assurance provided that the permittee initiates a process to continuously increase the amount of financial assurance until it is adequate to effect reclamation. An escrow account may be established that is based on production gross sales and serves to provide regular payments to an account that is designed to grow to the amount necessary to guarantee performance of reclamation by the expected time of final reclamation. The period of the financial assurance is dictated by the period of time required to establish the post mining land use declared and approved of in the mine reclamation plan. This may extend beyond the permit if required to accomplish successful and complete implementation of the reclamation plan.

(4) FORM AND MANAGEMENT. Financial assurance shall be provided by the operator and shall be by a bond or an alternate financial assurance. Financial assurance shall be payable to the regulatory authority and released upon successful completion of the reclamation measures specified in the reclamation plan. Alternate financial assurances may include, but are not limited to cash, certificates of deposits, irrevocable letters of credit, irrevocable trusts, established escrow accounts, demonstration of financial responsibility by meeting net worth requirements, or government securities. Any interest from the financial assurance shall be paid to the operator. Certificates of deposit shall be automatically renewable or other assurances shall be provided before the maturity date. Financial assurance arrangements may include, at the discretion of the regulatory authority, a blend of different options for financial assurance including a lien on the property on which the nonmetallic mining site occurs or a combination of financial assurance methods.

(5) MULTIPLE PROJECTS. Any operator who obtains a permit from the regulatory authority for 2 or more nonmetallic mining sites may elect, at the time the second or subsequent site is approved, to post a single financial assurance in lieu of separate financial assurance instruments for each nonmetallic mining site. When an operator elects to post a single financial assurance in lieu of separate financial assurances for each mining site, no financial assurances previously posted on individual mining sites shall be released until the new financial assurance has been accepted by the regulatory authority.

(6) MULTIPLE JURISDICTIONS. In cases where more than one regulatory authority has jurisdiction, a cooperative financial security arrangement may be developed and implemented by the regulatory authorities to avoid requiring the permittee needing to prove financial assurance with more than one regulatory authority for the same nonmetallic mining site. Financial assurance is required for each site and 2 or more sites of less than one acre by the same operator, except that governmental units are not required to obtain financial assurance.

(7) CERTIFICATION OF COMPLETION AND RELEASE. (a) The operator shall notify the regulatory authority, by filing a notice of completion, at the time that he or she determines that reclamation of any portion of the mining site or the entire site is complete. The regulatory authority shall inspect the mine site or portion thereof that was the subject of the notice of completion to determine if reclamation has been carried out in accordance with the approved reclamation plan. The regulatory authority may partially release the financial assurance if it determines that compliance with a portion of the reclamation plan has been achieved and requires no waiting period. After determining that reclamation is complete, the regulatory authority shall issue a certificate of completion and shall release the financial assurance.

(b) The regulatory authority shall make a determination of whether or not the certification in par. (a) can be made within 60 days that the request is received.

(c) A regulatory authority may make a determination under this subsection that:

1. Reclamation is not yet complete;

2. It is not possible to assess whether reclamation is complete due to weather conditions, snow cover or other relevant factors;

3. Reclamation is complete in a part of the mine; or

4. Reclamation is fully complete.

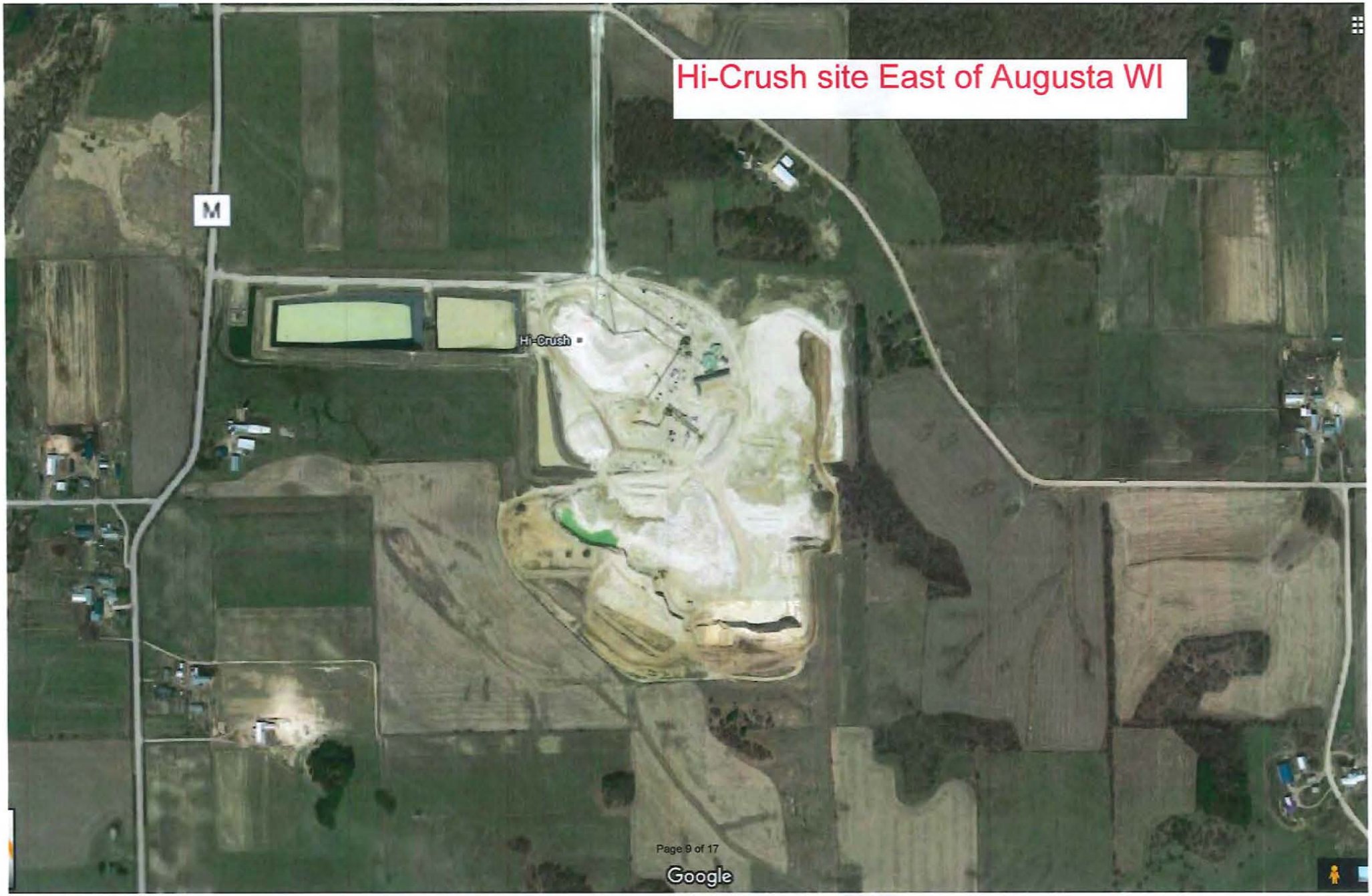
(8) FORFEITURE. Financial assurance shall be forfeited if any of the following occur:

(a) A permit is revoked under s. NR 135.25 and the appeals process has been completed.

(b) An operator ceases mining operations and fails to reclaim the site in accordance with the reclamation plan.

(9) CANCELLATION. Financial assurance shall provide that it may not be cancelled by the surety or other holder or issuer except after not less than a 90–day notice to the regulatory authority in writing by registered or certified mail. Not less than 30 days prior to the expiration of the 90–day notice of cancellation, the operator shall deliver to the regulatory authority a replacement proof of financial assurance. In the absence of this replacement financial assurance, all mining shall cease until the time it is delivered and in effect.

(10) CHANGING METHODS OF FINANCIAL ASSURANCE. The operator of a nonmetallic mining site may change from one method of financial assurance to another. This may not be done more than once a year unless required by an adjustment imposed pursuant to sub. (12). The operator shall give the regulatory authority at least 60 days' notice prior to changing methods of financial assurance and may not actually change methods without the written approval of the regulatory authority.


Hi-Crush site East of Augusta WI
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Hi-Crush
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Augusta's Hi-Crush plant laying off 27 employees

By Andrea Albers CONNECT
Posted: Oct 12, 2015 5:35 PM CDT

Augusta (WQOW) - An area sand mine is halting work and laying off nearly 30 employees.

The Hi-Crush plant in Augusta is cutting 27 jobs effective immediately. In a letter to the Wisconsin Department of Workforce Development, Hi-Crush said it has no choice but to halt production due to a drastic decrease in the price of oil and the impact that has had on the sand industry.

Hi-Crush said to function as cost-effectively as possible, the layoffs are necessary.

Amegy Bank N.A.

P.O. Box 27459
Houston, Texas 77227-7459

Office Address:
4400 Post Oak Parkway
Houston, Texas 77027

Swift: SWBKUS44
Phone: (713) 235-8800
Fax: (713) 232-5928

IRREVOCABLE LETTER OF CREDIT

Amount: $1,055,379.00 Date: May 25, 2012

To: County of Eau Claire
Planning & Development Department Land Conservation Division
227 1st Street West
Altoona, WI 54720

At the request of and for the account of Hi-Crush Proppants LLC for Hi-Crush Augusta LLC, 3 Riverway, Suite 1550, Houston, Texas 77056 ("Applicant") we hereby establish this Irrevocable Letter of Credit no. SC 7774 in favor of Eau Claire County as beneficiary up to the aggregate amount of One Million, Fifty-Five Thousand, Three Hundred Seventy-Nine and No/100 Dollars ($1,055,379.00).

We hereby irrevocably authorize you draw on us, in accordance with the terms and conditions hereinafter set forth, up to an amount not exceeding $1,055,379.00 (the "stated amount") for nonmetallic mining reclamation ("project") located in the Town of Bridge Creek, Eau Claire County, Wisconsin. Each draw hereunder shall reduce the stated amount of this Irrevocable Letter of Credit.

The purpose of this Irrevocable Letter of Credit is to secure the Applicant's nonmetallic mining reclamation permit (the "permit" or "reclamation permit") as well as ensure compliance with other conditions of the permit issued to the Applicant by the County of Eau Claire in accordance with Chapter 18.94 and 18.96 of County Code. In the event the County of Eau Claire Land Use Controls Supervisor unilaterally determines that the Applicant has failed to reclaim the project in accordance with the terms of the permit, the County through its Planning and Development Committee, is authorized to draw upon this Irrevocable Letter of Credit without any further consent on the part of the Applicant, for the purpose of securing compliance with the permit, by presentation of the County's SIGHT DRAFT drawn on Amegy Bank N.A. and bearing reference to this Irrevocable Letter of Credit no. SC 7774.

This Irrevocable Letter of Credit is effective on May 25, 2012, and shall expire on May 25, 2013, except that this Letter of Credit shall automatically extend on the termination date for a term of one year and annually thereafter on each successive termination date until all of the implementation requirements have been completed, unless we elect to cancel/not extend this Irrevocable Letter of Credit. In the event we wish to cancel/not extend this Irrevocable Letter of Credit, we shall provide notice in writing of our intent to cancel/not extend the Letter of Credit to the beneficiary by registered or certified mail at least 90 (ninety) days prior to the end of the current or any automatically extended term of this Letter of Credit. Unless the Applicant delivers to the beneficiary a replacement Letter of Credit or other acceptable proof of financial assurance under Chapter 18.96 of the County Code, we will pay to the beneficiary the unused balance of this letter of credit on the termination date upon receipt by Amegy Bank N.A. of beneficiary's sight draft drawn on Amegy Bank N.A. and indicating Letter of Credit no. SC 7774.

We understand that this Irrevocable Letter of Credit is only released from the financial assurance responsibilities as contained herein following the written notice of release from the Land Use Controls Division after Applicant's full compliance with the reclamation permit as issued under Chapters 18.94 and 18.96 of the Eau Claire County Code, and Amegy Bank N.A. is provided copy of such release accompanied by the return of this original Irrevocable Letter of Credit to Amegy Bank N.A.

I certify that I am authorized to execute this Irrevocable Letter of Credit on behalf of Amegy Bank N.A., a bank or financial institution which is examined and regulated by federal agency.

Attest:

James A. Ardissono, SVP
(Signature and Title of Official of Issuing Institution)

May 25, 2012
(Date Signed)

Devika Patel, AVP
(Signature and Title of Official of Issuing Institution)

(Signature of Applicant)

May 25, 2012
(Date Signed)

Hi-Crush Proppants LLC for
Hi-Crush Augusta LLC

This letter of credit is subject to the Wisconsin uniform Commercial Code and the Uniform Customs and Practice for Documentary Credits as most recently published by the International Chamber of Commerce.

EXHIBIT A

ORIGINAL

Hi-Crush Augusta Site - Proposed Reclamation Financial Assurance Summary Worksheet

Reclamation Item	Units	Description	Suggested Cost	Number of Units	Reclamation Cost
Final mine boundary slopes	CY	Regrading and Topsoil Costs	$2.00	60,230	$120,460.00
	Acre	Revegetation Cost (disc)	$600.00	56	$33,600.00
	Acre	Revegetation Cost (hydro seed)	$1,100.00	56	$61,600.00
	CY	Regrading Reclamation Slopes	$0.50	3,395,500	$1,697,750.00
Restored Mine Bottom	CY	Regrading and Topsoil Costs	$2.00	326,970	$653,940.00
	Acre	Revegetation Cost (disc)	$600.00	304	$182,400.00
	Acre	Revegetation Cost (hydro seed)	$1,100.00	304	$334,400.00
	CY	Regrading Mine Bottom	$0.50	7,338,100	$3,669,050.00
Storm Water Construction	SY	Rip Rap erosion lining	$24.00	750	$18,000.00
	SY	Erosion Mat on Slopes	$1.00	250,000	$250,000.00
	LF	Silt Fence	$1.00	9,000	$9,000.00
	LF	Drainage Swales	$3.00	3,000	$9,000.00
			TOTAL MINE AREA RECLAMATION		$7,049,200.00
				MINE AREA (acres)	352
			approx. financial cost per acre		$20,026.14
Structures and Wash Plant					
	Each	Remove Wash Plant	$100,000.00	1	$100,000.00
	Each	Abandon High Cap. Well	$3,000.00	1	$3,000.00
				TOTAL WASH PLANT	$103,000.00
Conveyor Corridor (10.5 acres)					
	LS	Remove Conveyor	$260,000.00	1	$260,000.00
	Sta.	Conveyor Corridor Restoration	$2,000.00	45	$90,000.00
				TOTAL CONVEYOR	$350,000.00
Care and Maintenance					
	Annual	Site Monitoring and reporting	$5,000.00	36	$180,000.00
YEAR 1 Financial Assurance					
Mine Phase 1	29.63 acres		20,026.14	29.63	$697,379.65
Wash Plant			103,000.00	1	$103,000.00
Conveyor Corridor			350,000.00	1	$350,000.00
Site monitoring and Reporting			9,000.00	1	$9,000.00
			TOTAL YEAR 1 FINANCIAL ASSURANCE		$1,059,379.65

P:\Jobs\Hi-Crush Silica Sand Reclamation\Augusta Reclamation\Appendix J - Estimated Reclamation Cost\Hi-Crush Augusta FA Amount for 2.xls

A Guide to Developing Reclamation Plans for Nonmetallic Mining Sites in Wisconsin

PUBL-WA-834 2002

February 2002

Produced by the Wisconsin Department of Natural Resources
Bureau of Waste Management
P.O. Box 7921
Madison, WI 53707

Authors

Tom Portle, Phil Fauble and Ryan Jakubowski

APPENDIX F

FINANCIAL ASSURANCE

The objective of financial assurance is to ensure that the regulatory authority has access to funds necessary to implement site reclamation in the event that the operator does not perform the agreed-upon duties. The funds shall accurately reflect the cost for the RA to hire outside help to perform reclamation. The main purpose of financial assurance is to ensure that the operator will faithfully execute the requirements of the approved reclamation plan, the applicable reclamation ordinance and Ch. NR 135. Refer specifically to s. NR 135.40 for details of state wide financial assurance requirements, as well as the applicable county or municipal reclamation ordinances.

The mine reclamation plan should be structured to keep the number of unreclaimed acres to a minimum at any given point in time. This can be accomplished by mining in phases: extract the material and promptly perform reclamation prior to initiating mining elsewhere. Generally, a smaller amount of acreage being effected by mining will result in less financial assurance to be posted. It is even plausible that one bond (or other means of financial assurance) could be posted to cover the various mining phases (intermittent mining) dictated in the mine reclamation plan.

Because much of the financial assurance is dependent upon the mine reclamation plan, it is important for an operator who has drafted a plan to contact the RA and bring them up to date. At this point, the RA shall decide if the plan will require revisions or if it can be accepted as is. In any case, the plan must meet the requirements of Ch. NR 135.

The following list has been created to serve as a flow chart for operators to follow when drafting their financial assurance. The list is only a summary of the requirements of s. NR 135.40 and users should refer to the official code or contact their regulatory authority for specific requirements.

1. The operator contacts the regulatory authority and discusses their plans for a post-mining land use. Eventually, both parties shall reach consensus.

2. The operator prepares the reclamation plan, accounting and tallying the costs as the plan is being drafted. In the reclamation plan, the operator should suggest an amount to put-up for financial assurance.

3. The reclamation plan is submitted to the regulatory authority.

4. If the plan is approved, the RA must provide written notification to the operator specifying the amount of financial assurance required per s. NR 135.40(1).

5. As a condition of the permit, financial assurance, which must be payable exclusively to the regulatory authority, is filed with the RA per s. NR 135.40(2).

6. A bond or an alternate option must be established to cover financial assurance per s. NR 135.40(4). (A short list with a brief description shall follow).

7. The amount of financial assurance is reviewed periodically by the RA to assure that it equals

outstanding reclamation costs per s. NR 135.40(3).

8. The length of financial assurance is dictated by the period of time required to establish the post-mining land use specified in the approved mine reclamation plan. This may extend beyond the permit if required to accomplish reclamation per s. NR 135.40(3).

9. Any interest from the financial assurance must be paid to the operator per s. NR 135.40(4).

A few options that may benefit smaller operators in satisfying financial assurance requirements have been included within the administrative code. For instance, it is possible that, at the discretion of the RA, a combination of financial assurance methods, including a lien on the property on which the nonmetallic mining site occurs, may be selected. The RA may also accept a lesser initial amount of financial assurance, provided the permittee initiates a process that continuously increases the amount until it is adequate to reflect the costs of reclamation.

Brief Description of Financial Assurance Options

• Bond - collateral; also known as a performance or forfeiture bond; an instrument provided by a surety company; a 3-party agreement that serves as a guarantee that the provider will pay costs associated with fulfilling the permittee's obligations in the event of a default

• Cash - collateral; a deposit with the RA to guarantee performance of obligations under a reclamation permit

• Certificate of deposit - collateral; a deposit with the RA to guarantee performance of obligations under a reclamation permit

• Irrevocable letter of credit - similar to a bond with the bank or financial institution taking the place of a surety; established solely for the purpose of guaranteeing performance of obligations under a reclamation permit

• Irrevocable trust - trust created by the permittee solely for the purpose of guaranteeing performance of obligations under a reclamation permit

• Escrow account - account with a bank or financial institution established by the permittee to satisfy the financial assurance requirements (i.e. to guarantee the performance of the reclamation activities described in a reclamation permit)

• Net worth test - Method in which a permittee provides sufficient financial data to demonstrate compliance with minimum financial standards, which is accompanied with the opinion of an independent certified public accountant in order to establish proof of financial responsibility

• Government securities - a deposit with the RA to guarantee performance of obligations under reclamation permit

NEWS RELEASE

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Hi-Crush Partners LP Reports First Quarter 2016 Results

Exhibit 99.1

HI CRUSH

News Release

Hi-Crush Partners LP Reports First Quarter 2016 Results

- Completed Revolving Credit Facility amendment and $40.0 million common unit offering
- 1Q 2016 Revenues of $52.1 million vs. $102.1 million in 1Q 2015
- 1Q 2016 Adjusted EBITDA, excluding bad debt expense, of $(2.7) million vs. $29.6 million in 1Q 2015

Houston, Texas, April 28, 2016 - Hi-Crush Partners LP (NYSE: HCLP), "Hi-Crush" or the "Partnership", today reported that, the Partnership completed a third amendment to its Revolving Credit Facility Agreement. The amendment, among other things, waives the minimum quarterly EBITDA covenants, provides for a reduction in the commitment level from $100 million to $75 million, and permits a maximum EBITDA loss for the six months ending March 31, 2017. The amendment also provides for an equity cure that can be applied to EBITDA covenant ratios for 2017 and all future periods. As of March 31, 2016, the Partnership had $248.6 million of long-term debt outstanding, and was in compliance with the covenants defined in the Revolving Credit Facility Agreement.

On April 28, 2016, the Partnership entered into an underwriting agreement with an investment bank for a firm commitment underwriting of a common unit offering, which is expected to fund approximately $40.0 million of gross equity issuance proceeds on or about May 4, 2016. Proceeds from the common unit offering will be used for general partnership purposes.

"Although the industry still faces headwinds, by amending our credit facility and completing our common unit offering we further enhanced our ability to navigate the downturn and provide needed flexibility," said Robert E. Rasmus, Chief Executive Officer of Hi-Crush. "Although we see near and intermediate term challenges, as a flexible, full-service provider, we anticipate that we will benefit from the recent market exit of higher cost sand supply even among some Tier 1 suppliers. Our team is committed to being operationally and financially proactive, optimizing our cost structure and ultimately leading the frac sand industry through change and recovery."

Hi-Crush today also reported first quarter 2016 results. The limited partners' interest in adjusted net loss, adjusted to exclude the impact of one-time expenses, was $(17.7) million resulting in a basic and diluted adjusted loss of $(0.48) per limited partner unit. In addition, the quarter was negatively impacted by $33.7 million of one-time expense associated with the impairment of our goodwill. Including the impact of these charges, the limited partners' interest in net loss was $(51.5) million for the first quarter of 2016, resulting in basic and diluted loss of $(1.39) per limited partner unit.

Earnings before interest, taxes, depreciation and amortization, adjusted for non-cash impairment of goodwill ("Adjusted EBITDA") for the first quarter 2016 was $(11.0) million and was negatively impacted by bad debt expense of $8.2 million, primarily related to the increased provision for uncollectible receivables due to the bankruptcy of one of our spot customers. Distributable cash flow attributable to the limited partners for the first quarter of 2016 was $(13.8) million. No distributions to unitholders were declared for the first quarter of 2016, as the Partnership continued its distribution suspension to conserve cash.

"Rig count and well completion activity continued to decline in the first quarter," said Mr. Rasmus. "These declines, combined with continued market uncertainty, resulted in a non-cash impairment of goodwill attributable to our 2013 acquisition of D&I Silica. In addition, the bankruptcy of one of our spot customers resulted in additional bad debt expense. Despite these one-time items, we continue to execute on our plan to leverage our lowest cost plants, with a focus on profitable sales, rather than chasing unprofitable market share."

Revenues for the quarter ended March 31, 2016 totaled $52.1 million on sales of 1.0 million tons of frac sand. This compares to revenues in the fourth quarter of 2015 of $72.1 million on sales of 1.2 million tons of frac sand. The decline in sales volumes is attributable to the decline in overall industry demand for frac sand, combined with the decision to turn down unprofitable orders. Approximately 59% of our volumes were sold in-basin for the first quarter of 2016, an increase from 52% in the fourth quarter of 2015 and 44% in the first quarter of 2015. Average sales price per ton sold increased to $54 per ton in the first quarter 2016 from $52 per ton in the fourth quarter 2015, reflecting the mix impact of increased in-basin sales.

Of the 1.0 million tons of frac sand sold during the first quarter of 2016, approximately 59% was produced and delivered from the Partnership's facilities, with the remainder being purchased from our sponsor's Whitehall and Blair facilities. Contribution margin was $2.41 per ton in the first quarter of 2016. This contribution margin was the result of filling more profitable orders and the reduction in volumes produced and delivered from the relatively higher production cost Augusta facility. The Augusta facility stopped shipping sand in February 2016.

"Our focus on cost reductions is relentless," said Laura C. Fulton, Chief Financial Officer of Hi-Crush. "We have been successful in reducing freight rates to certain locations, and have efficiently managed our railcar fleet well in this environment. As a result, we only have approximately 1,900 cars in paid storage, and have continued to increase the number of cars we ship via unit trains to almost 40%."

The Partnership updated guidance for 2016 capital expenditures to a range of $15-$20 million, of which $1.9 million was spent in the first three months of the year, primarily for the completion of a distribution terminal facility under construction in Texas.

Other Updates

Hi-Crush also announced the completion of our sponsor's Blair facility in March 2016. The 2.86 million ton per year frac sand facility was completed a month ahead of schedule. Following Blair's completion, our sponsor's Whitehall facility is being temporarily idled in favor of the lower cost production available from the Blair facility. Both facilities are located on the Canadian National railway.

Conference Call

On Thursday, May 5, 2016, Hi-Crush will hold a conference call for investors at 7:30 a.m. Central Time (8:30 a.m. Eastern Time) to discuss Hi-Crush's first quarter 2016 results. Hosting the call will be Robert E. Rasmus, Chief Executive Officer and Laura C. Fulton, Chief Financial Officer. The call can be accessed live over the telephone by dialing (855) 327-6837, or for international callers, (631) 891-4304. A replay will be available shortly after the call and can be accessed by dialing (800) 319-6413, or for international callers (631) 883-6842. The passcode for the replay is 00491. The replay will be available until May 19, 2016.

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Department of Natural Resources

MEETING APPEARANCE

Personally identifiable information collected on this form is used for administrative purposes and may be provided to requesters under the public records laws, ss. 19.31 to 19.39, Wis. Stats.

PLEASE PRINT:

Name: [redacted]	Do you wish to make an oral statement? (Check one) ☐ Yes ☐ No
E-mail:	Telephone number (include area code): ( )
Address:	
City, State and zip code:	

Shared during testimony

[redacted]

[redacted]

[redacted]

7/20/15

Pierce, Crispin H. <PIERCECH@uwec.edu>

Hi [redacted]

With this note, I also wanted to share the results of the sediment in your pond water. There was indeed a presence of respirable (<4 μm) and fine (<2.5 μm) crystalline silica particles, as seen in a phase-contrast microscope analysis of the pond sediment sample. The source of the silica present in the sediment may have been from a nearby sand mine, as evidenced by the sharp, jagged appearance of the silica "shards" (which are caused by abrupt and destructive processes, particularly blasting). Owing to their small size, the particles could have easily been carried by the wind from a post-blasting dust plume or off of a pile of unprocessed sand to settle in your

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PUBLIC HEARING COMMENTS ON THE "Wisconsin Department of Natural Resources Industrial Sand Mining in Wisconsin Strategic Analysis for Public Review"
26 July 2016

The review is incomplete as it does not consider important recent studies on air quality in and around frac sand and similar facilities. These studies were previously provided to DNR staff Kristin Hart, Gail Good, Jason Truetel and Roberta Walls, and I will briefly summarize each:

1. Mine Safety and Health Administration measurements of respirable (PM_4) crystalline silica levels to which Wisconsin mine and processing plant workers are exposed (http://www.msha.gov/drs/drshome.htm).
2. National Institute for Occupational Safety and Health measurements of PM_4 crystalline silica levels to which hydraulic fracturing workers are exposed around the country (J Occup Environ Hyg. 2013;10(7):347-56. Occupational exposures to respirable crystalline silica during hydraulic fracturing. Esswein EJ1, Breitenstein M, Snawder J, Kiefer M, Sieber WK).
3. Pierce et al. measurements of $PM_{2.5}$ levels around frac sand plants in Wisconsin and Minnesota: (J Environ Health Nov 2015: 8–12 (2015) PM2.5 Airborne Particulates near Frac Sand Operations; Pierce, Crispin H., Kristin Walters, Jeron Jacobson, and Zachary Kroening).
4. Pierce et al. measurements of $PM_{2.5}$ and PM_{10} levels in Bloomer/Cook's Valley, WI from Oct. 2014 – July 2016. Reports sent to WDNR staff Gail Good and Jason Truetel on 18 December 2014, 4 March 2015, 8 June 2015, 29 December 2015, 19 February 2016 and 20 July 2016.
5. University of Iowa Ryan Grant Master's Thesis measuring $PM_{2.5}$ around frac sand plants (University of Iowa, http://ir.uiowa.edu/etd/1846), Community based air quality monitoring near proppant sand facilities, Ryan James Grant).
6. The US Environmental Protection Agency recognizes the following "top sources" of $PM_{2.5}$ in their consideration of criteria and hazardous air pollutants (http://www.epa.gov/ttn/chief/net/2008neiv3/2008_neiv3_tsd_draft.pdf, table 4):
    a. ...
    b. ...
    c. Dust - Construction Dust
    d. Dust - Paved Road Dust
    e. Dust - Unpaved Road Dust
    f. Industrial Processes – Mining
7. The US EPA has established $PM_{2.5}$ emission factors for mechanical processes associated with coal mining (AP-42 section 11.9). Processes identified that generate $PM_{2.5}$ include blasting, truck loading, bulldozing, dragline, vehicle traffic, grading, active storage pile (table 11.9-1) and drilling, topsoil removal by scraper, overburden replacement, truck loading by power shovel, train loading, bottom dump truck unloading, end dump truck unloading, scraper unloading and wind erosion of exposed areas (table 11.9-4). They further state "All operations that involve movement of soil or coal, or exposure of

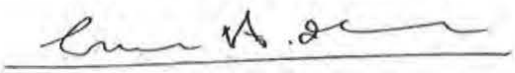
erodible surfaces, generate some amount of fugitive dust." (http://www.epa.gov/ttn/chief/ap42/ch11/final/c11s09.pdf).

8. The Western Regional Air Particulates Fugitive Dust Handbook identifies the following sources of $PM_{2.5}$ and PM_{10} fugitive dust emissions http://www.wrapair.org/forums/dejf/fdh/content/FDHandbook_Rev_06.pdf):

    a. ...
    b. Paved Roads
    c. Unpaved Roads
    d. Storage Pile Wind Erosion
    e. Mineral Products Industry

9. Madungwe and Mukonzvi found levels of 14.23–69.01 mg/m^3 $PM_{2.5}$ around a stone quarry (Atmospheric and Climate Sciences, 2012, 2, 52-59 Assessment of Distribution and Composition of Quarry Mine Dust: Case of Pomona Stone Quarries, Harare. Emaculate Madungwe and Tinashe Mukonzvi).
10. Jeffrey Johnson, an environmental engineering supervisor at the DNR ... said there are "a couple of [frac sand plants] that would exceed the [federal] $PM_{2.5}$ standards." (Source: Inside Climate News, 5 Nov. 2013)

Sincerely,



Crispin H. Pierce, Ph.D.
Professor / Program Director

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DNR Strategic Analysis Comment Sheet

Industrial Sand Mining in Wisconsin

Please submit your comments on the Draft Strategic Analysis by Monday **August 22, 2016**

From:

Name: [redacted]

Address: [redacted]

Eau Claire, WI 54703

Phone: [redacted]

E-mail: [redacted]

PLEASE DEPOSIT COMMENT AT THE HEARING

or,

- Fold this sheet and mail stamped sheet to the printed address on the back *or,*
- Send email comments to: DNRISMSA@wisconsin.gov *or,*
- Add additional pages of information and send in a stamped envelope to:

ISM SA Coordinator
WDNR OB/7
P.O. Box 7921
Madison, WI 53707-7921

Comments:

There's a need for the DNR to include significant air monitoring at each mine site to determine if there's health-damaging particulate produced by blasting, open sand pits, and other mining processes.

The reclamation laws requiring up-front cash to be deposited with the County should be part of the permitting - plus tighter rules to keep Sand Companies escaping ~~restriction~~ reclamation through loopholes in the law. The taxpayers shouldn't be picking up the costs of reclamation.

July 26, 2016

Re: Industrial Sand Mining in Wisconsin, Strategic Analysis for Public Review

I am pleased there has been an opportunity for public review of this document. The most positive idea brought up is the understanding that there are sand mine operations resulting in metals entering the water systems. This was discussed by the DNR at least three years ago. I also find the listing of various permits useful.

The entire process of sand mining has significantly greater effects on (especially nearby) citizens than is implied in this Analysis despite the mention of "the welfare of the public...". Factors failing citizens are in the air, water, and land regulations as well as problems in the overall mining process. Basically, the issuing of permits is giving permission to pollute. When pollution is condoned it is bound to affect people.

Overall Concerns

In general, the lack of DNR on-site inspections of these for profit companies significantly reduces the credibility of self-monitoring data from the mines, increases a willingness of the mine owners to "fudge" for the sake of profit, reduces the trust of citizens believing the DNR is doing it's job, results in failure of the DNR to enforce timely remediation of problems, and forces the DNR to rely on citizen complaint. The Analysis contains no indication of more frequent inspections. More inspections are an absolute must. The consistent use of "self-monitoring" is suspect and akin to "the fox guarding the hen house".

No cumulative studies have been done on property values, air, water, or soil. The DNR has not begun any (to my knowledge) longer term studies. Citizens feel like guinea pigs. The DNR itself has done no scientific studies of the consequences of frac sand mining so conclusions drawn about safety are questionable.

Throughout the analysis general and subjective descriptions are used. Examples include "timely incorporation", BMPs, unlikely, reasonable (typically defined as cost), material injury, may be enclosed, appears, etc.

Because of the lack of DNR scientific studies, sources are listed in an attempt to lend credence to the conclusions of the study. However the Heartland, Health Institute, and Richards reports all have serious faults. (See further comments below.) As a result they undermine, rather than support statements in the Strategic Analysis.

Air

The analysis implies that air monitoring is adequate. Reliance on one flawed study funded by one mine using data from one mine is inappropriate to draw generalized statements from, especially when it has flaws. Additionally, any monitoring done is averaged over time, something that fails to consider the impact of a shorter period of time in which a dense formations of particulates

occur. It is the density of particulates that is of concern. Results on the DNR website indicate high levels of crystalline silica definitely do occur. Air monitors far from mining sites do not reflect what happens near the mine and should not be used to document air quality at a mine.

No one studies the effects of blasting beyond the Department of Safety saying blasts are within the law, yet continuous weekly blasting cracks walls, causes horses to bolt, and is much like a low level man-made earthquake imposed on the surrounding area.

Fugitive dust plans are simply not followed through or are inadequate. Citizens repeatedly observe sand blowing at unacceptable densities. There does not appear to be back-up plans for breakdowns in water trucks or when mines are sitting idle.

The DNR's new PM2.5 guidance for frac sand operations does not require dispersion modeling for PM2.5 (required under federal law) so there is no way to know if the facility is in compliance with NAAQS (National Ambient Air Quality Standards).

Water

The DNR has not moved to establish studies of ISM generated wastes in water nor changes in PH resulting in metals in waters, although this was mentioned to the public about 3 years ago by DNR staff. Private wells can fill with sand after mining starts leaving citizens to fight through the courts. I suspect that study of the underground geology might foretell this situation, but it is not done. A mine is to use flocculants according to the label. Without inspections and monitoring of waters this ends up being another self-monitored situation. Water running off site is left for citizens to check. Water held in lagoons is not subject to public monitoring or review.

Changes in water filtration resulting from re-created landfills needs to be looked at more carefully along with changes in water quality, including the introduction of metals into water.

Recent flooding in the state renews the importance of wetlands as they provide a place for holding and cleansing water. Flooding episodes are increasing and there needs to be more consideration to maintaining the wetlands and instead demand that industrial sand mines work around them.

No sufficient environmental impact of high capacity wells is done.

Testing done by the DNR showed high levels of metals in wastewater ponds and groundwater wells near frac sand operations but this is not specifically mentioned.

Land

Industrial sand mines destroy the life giving fungi in soil and the carbon holding power of the land. No consideration is given to that in the Strategic Analysis

despite carbon holding being worth large amounts of money. For a complete discussion of the land values lost through Industrial Sand Mining see https://www.fractracker.org/2015/07/wisconsin-silica-sand-mining/.

The Nonmetallic Mining Advisory Committee is mentioned, but the fact that it is mostly comprised of industry representative is not. Despite that, they consistently mention the DNR lacks staff to monitor reclamation. Reclamation currently is often developed and monitored by local officials resulting in inconsistency due to lack of knowledge and inadequate financing. No research has been completed to document what is even adequate reclamation – another area with no DNR research.

Cited Resources

Using material by Issac Orr (Heartland Institute) and the Health Impact Assessment of Industrial Sand Mines in Western Wisconsin undermine the reliability of the Strategic Assessment. Issac Orr is not a researcher doing authentic research. He interprets information to present a pro-sand mining position for the industry. Conclusions he reaches too often lack facts to adequately back them up, such as "Frac sand mining leads to cleaner air" and slanderous comments about an assistant university professor. See: https://www.fractracker.org/2015/07/wisconsin-silica-sand-mining/
These comments were also published on the site of Rock Products.

The Health Institute report also makes deductions without adequate proof, such as saying that the 13 DNR monitors do not indicate an increase in air bound silica, failing to mention that none of the monitors are located near a sand mine. Using county wide health information to say there is no increase in asthma is inadequate as the issue is those living near the mine, not the entire county. The report includes almost nothing about water. In essence the health report fails repeatedly to indicate where it has a lack of information and instead draws conclusions based on inadequate research.

Both Orr and the Health Institute report cite the Richards study, which you also cite. That seems like redundancy being used to lend more credence to the Strategic Analysis Report. The DNR must do it's own research rather than accepting compilations of a few other studies.

One also wonders why WISA is cited. The group now has only two member sand companies and does not necessarily reflect any control over the many other industrial sand mines in Wisconsin. Belonging to a Green Tier program does not necessarily mean the company will conduct a better reclamation project.

Summary

In summary, the Strategic Analysis appears to be a draft document. While current statutes and regulations are cited, it also documents what has not been done to protect citizens in Wisconsin. The DNR could look seriously at what is happening in Minnesota as Wisconsin has been remiss in establishing much needed controls over the industrialization of rural Wisconsin as well as working collaboratively with

those who are independently attempting to do research. If the DNR is unable to complete the needed research of sand extraction, the hiring of independent researchers will be necessary (as promised by Gov. Walker).

The state of Wisconsin and the DNR has had two valuable lessons in what happens when rural areas are industrialized. The invasion of frac sand mining and CAFOs both arrived without the state having adequate studies and regulations on the books. This lack of foresight has been incredibly damaging to the environment.

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