

Frac Sand Mining in Wisconsin: Understanding Emerging Conflicts and Community Organizing

Thomas W. Pearson

Thomas W. Pearson is with the University of Wisconsin-Stout, Menomonie, WI

Abstract

Over the past few years industrial sand mining has expanded rapidly in western Wisconsin, driven largely by the use of sand in hydraulic fracturing, itself a controversial technology widely deployed in natural gas and oil drilling throughout the United States. A unique geological history combined with existing railroad networks has positioned Wisconsin as a major supplier of “frac sand” and thus a key link in a wider hydrocarbon commodity chain. The unprecedented growth of frac sand mining, however, has raised new social and environmental concerns, becoming the target of grassroots organizing. This article reports on ongoing ethnographic research focused on frac sand conflicts, providing an overview of the main areas of contention, the trajectory of community organizing, and the response of the mining industry. [hydrofracking, silica sand, mining, local democracy, landscape, property, grassroots organizing, Wisconsin]

The use of hydraulic fracturing (“fracking”) in shale gas production and unconventional oil drilling has spurred an unprecedented expansion of sand mining in western Wisconsin and southeastern Minnesota, introducing new forms of environmental and social upheaval to the region. While the impacts of fracking have been the focus of considerable scholarly and media scrutiny in recent years, the extractive industries that supply raw materials for unconventional energy production have received much less attention. Pumped with water and other fluids into an

oil or gas well, silica sand props open the fractures created in shale bedrock during the horizontal drilling process. A typical frac well requires between 1,500 to 2,000 tons of sand, and with hundreds of thousands of wells throughout the United States alone, some analysts suggest that nationwide demand could reach 40 to 50 million tons annually, “enough to fill the nation’s tallest building, the former Sears Tower, 21 times each year” (Prengaman 2012a). Almost pure quartz, extremely dense, nearly spherical, and uniform in size, silica sand is the hidden key that unlocks unconventional energy, as well as the controversy surrounding fracking. Due to geological processes thousands of years in the making, large deposits of sandstone are uniquely concentrated in western Wisconsin and parts of Minnesota, positioning the region as a leading source of the raw silica sand—or frac sand—that meets industry specifications. This has sparked a frenzied construction of open-pit sand mines and industrial processing plants, unexpectedly linking small rural communities to “an extended, complex, and unruly hydrocarbon commodity chain” of unconventional energy production (Bridge 2011:310).

New forms of social, ecological, and ideological conflicts are unfolding along this commodity chain. Rural townships are overwhelmed with proposals by mining companies, which entice property owners and farmers to lease their land with promises of a modern-day “gold rush.” Several networks of concerned citizens have organized to raise questions about environmental and health risks and the uneven distribution of benefits and costs associated with sand mining, and to resist the removal of hills, bluffs, and picturesque farmland. For the past year I have been conducting ethnographic research on these conflicts in western Wisconsin, where I regularly attend public hearings, participate in local community groups, and have begun conducting informal and formal interviews with both opponents and supporters of frac sand mining. From my perspective, the sand mining boom illuminates the connections between local land-

Thomas W. Pearson is a cultural anthropologist and teaches in the Social Science Department at the University of Wisconsin-Stout, where he is also affiliated for the 2012–2013 academic year with the Center for Applied Ethics.

scape change and broader-scale political economic processes (Bridge 2004). How is sand converted into a global commodity for use in energy production? How does this process alter environmental, social, and ideological landscapes around extraction sites? How do various actors—landowners, corporations, government officials—negotiate and contest the right to indelibly transform shared landscapes through mining?

One of my central concerns is that the pace, scale, and powerful interests behind frac sand mining have created a structural imbalance that favors private companies involved in energy and resource extraction at the expense of local communities.¹ I have oriented my research toward examining how community members negotiate this structural imbalance, exploring how their position might be strengthened in the interest of promoting local, democratic decision making, social and environmental justice, and community-based sustainable development. This article reports on my ongoing research, providing an overview of the main points of conflict and concerns related to environmental health, economic impacts, and local democracy. I then offer a preliminary assessment of community-based organizing and the industry's response to local opposition.

“Who Could Have Imagined It?”

Wisconsin is not the only source of raw material to use as a “proppant” in the fracking process, and ceramic proppants are synthetically manufactured. However, in addition to unique geological formations that have left abundant reserves of sandstone, deposits of Wisconsin frac sand are considered pure and close to the surface, either exposed or covered with only a thin layer of overburden or topsoil. This makes extraction and processing more efficient and profitable. Almost as crucial as the sand itself, transportation infrastructure, especially railroad networks, is well developed, allowing millions of tons of material to be loaded onto railcars and shipped to shale basins in Texas, North Dakota, Pennsylvania, and elsewhere.

Sand has been mined in Wisconsin for decades for use in countless industries, such as glass manufacturing, foundry, or water filtration. Small-scale quarries also exist throughout the state to provide aggregate for road and building construction. While sand mining has a long history, five years ago only a handful of industrial silica sand mines existed in

Wisconsin, drawing little attention. Over the past two years this has changed dramatically. By July 2011, news reports estimated 41 frac sand operations active or in planning (Smathers 2011). Barely a year later, frac sand operations, including mines, processing plants, and railroad transload facilities, had doubled, with estimates of 107 sites active or in development, quickly making Wisconsin the nation's largest producer of frac sand (Prengaman 2012b).

In contrast to traditional sand mining, frac sand mining occurs on a much larger scale, with mines ranging from two hundred to over a thousand acres, some operating 24 hours a day for eight to nine months out of the year. In a typical operation, overburden or topsoil is removed from a hillside to expose the underlying sandstone. Miners often drill or blast the exposed sandstone, and then the loose sand is transported to a wash plant, where it is screened and mixed with water to remove clay, shale, or other unwanted material. The wet sand is transported to a dryer and then further screened to separate the granules by size. Twenty-ton dump trucks transport the final product, usually to a special transload facility located along a rail line, and the sand is then loaded onto trains. The average frac sand mine in Wisconsin will move 900,000 tons of sand per year. A diverse array of companies and conglomerates have joined the frac sand rush, including small quarry operators attempting to expand into the new hydrofracking market; companies with deep roots in Wisconsin, such as Badger Mining Corporation; or companies that produce sand to supply diverse markets, such as Ohio-based Fairmount Minerals. Several oil and gas corporations have also opened mines and processing facilities in Wisconsin, such as Texas-based EOG Resources (formerly Enron Oil and Gas), to directly supply their drilling operations throughout the country.²

In addition to the scale and industrial character, a lot of money is at stake. Estimates vary, but frac sand has reportedly sold for \$45 to \$80 per ton before shipping, which is more than double the cost of production, and then up to \$300 per ton when transportation costs are included. Some mining companies have offered lucrative payments to landowners who agree to sell or lease their land. The Federal Reserve Bank of Minneapolis reports that “Windsor Permian, a Texas oil and gas firm, paid over \$16,000 an acre—well above market value—for a potential mining site near Red Wing, Minnesota. In west-central Wisconsin, farmers have been offered six-

figure mineral rights fees, plus royalties of \$1.50–3 per ton for their frac sand,” which can easily add up to hundreds of thousands of dollars in extra income per year (Davies 2012:13).

While some landowners hope to cash in, their neighbors are rarely pleased to learn that a large, open-pit strip mine and associated industrial activities will be located nearby. As geographer Gavin Bridge notes, “one person’s discovery is another’s dispossession” (Bridge 2009:15). Capturing this sense of inequity, Tom Woletz of the WI Department of Natural Resources (DNR) describes frac sand mining “as a very divisive local issue, with some people becoming quite wealthy in what used to be a tough rural farming area. It’s certainly big money and a big change. And if you’re not in, you’re out. So you’ve got families and neighbors that aren’t going to talk to each other for the rest of their lives and hillsides you looked over your whole life now cut wide open. Who could have imagined it?” (Brown 2012).

“If You’re Not In, You’re Out”

While some people welcome frac sand mining, others have expressed concerns about new environmental health risks, dramatic land use changes, and uncertain socioeconomic impacts. One concern centers on air quality. Mining, blasting, processing, and transportation of sand create silica dust, tiny particulate matter known in industry parlance as “fugitive dust.” When people inhale silica dust in excess quantities, especially freshly fractured crystalline silica, they face severe health risks, such as silicosis or lung cancer. The health risks of respirable crystalline silica have been known for many decades, and workplace exposure to silica dust is generally regulated.³ While the hazards of silicosis at worksites and in enclosed settings are understood and regulated, “little conclusive information exists regarding sources, controls or levels of silica present in ambient air,” and no federal standard exists for public exposure to silica particulates (WI DNR 2012:2).⁴ In 2011, a group of concerned citizens, including numerous medical professionals and environmental health experts, petitioned the DNR to list respirable crystalline silica as a hazardous air pollutant, requesting that they develop both a baseline public exposure limit and an adequate method for specifically monitoring silica dust. The DNR declined, maintaining that existing monitoring and regulation of air pollutants are sufficient to address silica particulates, and that

mining companies employ satisfactory best management practices to control silica dust (Christensen 2012).⁵

Beyond fugitive dust, other environmental concerns include impacts on surface and groundwater. At least six spills have occurred in which waste water or sediment escaped from holding ponds used by frac sand mines, including an incident in May of 2012 where sand and other sediment leaked for several days from a damaged holding pond into the St. Croix River until it was discovered by a hiker (Baran 2012). Separate from such incidents, the Wisconsin Geological and Natural History Survey is currently spearheading a five-year study in Chippewa County to evaluate how frac sand mining, along with agriculture, impacts groundwater recharge and withdrawal (Cooperative Extension 2012). In addition to groundwater recharge, one of the main concerns raised by citizens revolves around the use of chemicals in the washing and processing of frac sand. Processing plants use 4,000 to 6,500 gallons of water per minute to move and wash the raw material. Local aquifers cannot meet this demand, so processing plants reuse water where possible (McCurdy 2012). Chemicals known as flocculants, widely utilized in waste water treatment plants, are introduced during processing to cause sediment in murky water to clump together, allowing water to be separated from unwanted material and then reused. Some flocculants contain potentially toxic chemicals known as acrylamides and polyacrylamides, and experts lack a clear understanding of what happens when these are buried with mine waste or seep from holding ponds into groundwater systems (McCurdy 2012).

In addition to environmental issues, the socioeconomic impacts of frac sand mining are complex and have become subject to hotly contested interpretations. Industry supporters tout frac sand mining as a source of economic growth, especially job creation. But critics have raised questions about the negative impact of mining, such as the erosion of nearby property values and the displacement of other businesses or economic activities. Mining industries are notoriously unstable, vulnerable to boom-and-bust cycles and fluctuating global commodity prices, and this volatility easily transfers to local economies, especially remote rural communities, when they become dependent on resource extraction industries. Historically, mining has rarely served as a viable basis for long-term, environmentally sustainable economic

development (Deller and Schreiber 2012; Freudenburg and Wilson 2002; Wilson 2004). In Wisconsin, the sand rush has already shown signs of slowing down, and the recent decline of natural gas prices has led some frac sand mines to decrease their operations (Duley and Deller 2012b:15–16; Prengaman 2012c; Stetzer 2012). Even where operations maintain consistent activity over the long term, out-of-state ownership means that profits tend to leave the local community and the state (Duley and Deller 2012a). The ability of a local economy to capture economic benefits is also severely limited if mining operation employees live outside the community, or if the community lacks local businesses and services used by the operation, a common reality in rural communities. Given the anticipated decline of adjacent property values, increased costs to maintain roads and other infrastructure, and the cost of providing additional public services, it remains unclear whether frac sand operations will amount to a net increase in local tax revenue.

These concerns and the unprecedented pace of development have made frac sand mining extremely controversial, triggering passionate discussion and debate. Comparable to other conflicts over mining, such struggles “are not adequately captured as environmental disputes” (Bridge 2004:239), but rather illuminate battles over social, economic, and political arrangements, in this case rooted at the township level. Wisconsin currently lacks statewide regulations specific to frac sand mining. Aside from general environmental permits overseen by the DNR dealing with air quality, storm water, high-capacity wells, wetlands, and endangered species, the bulk of regulatory authority—dealing with land use restrictions and conditions of operation—falls to local units of government. This has set the stage for intensely local battles pitting neighbor against neighbor and seeing small-town, local officials suddenly facing off against powerful corporate interests.

Local Battles, Local Democracy

In large part, the ability of a local government to deal with frac sand mining depends on whether it has adopted zoning ordinances. Some estimates suggest that a third of frac sand operations have clustered in unzoned areas, “leaving local officials with little control over how or where mining occurs” (Prengaman 2012a). In addition to zoning, county and town governments have exercised regulatory author-

ity through temporary moratoriums, and some towns have begun drafting licensing ordinances (Harnisch 2011). Through licensing ordinances, towns may conditionally approve or prohibit frac sand operations case by case to protect public health, safety, and general welfare of town residents. One of the first such ordinances, adopted by the Town of Cooks Valley, was challenged by frac sand interests but was upheld by the Wisconsin Supreme Court in February of 2012. Towns have also negotiated “development agreements” with mining companies, contracts that specify conditions of operation or even payment of fees for maintenance, repair, and reconstruction of town roads.

Nevertheless, the potential wealth represented by frac sand has strained local government in unsettling ways. Many local officials are simply unprepared to deal with sophisticated corporations and the parade of lawyers and technical experts they bring to public meetings. Well-meaning town officials are easily blinded by the “flashbulb” effect of a new mine proposal: the dazzle of large sums of money, inflated claims about job creation and economic development, and assurances that everything is well regulated and under control. Local officials face considerable pressure from industry, especially when additional zoning or licensing regulations are under consideration, and even the implicit threat of a lawsuit can intimidate small, rural townships. In addition, in many towns a complex entanglement of interests may be involved in proposed frac sand operations. In both Buffalo and Trempealeau counties, for instance, where frac sand development has been especially intense, some officials serving on county committees and town boards are involved in proposals to open frac sand operations on their own land (Kennedy 2012b). In other cases, town board members may have family or close personal ties to landowners seeking to benefit from frac sand development.

Some local officials gain from the frac sand boom in other ways. Coveting their knowledge of local geography and town politics, industry has begun to lure some local officials with high-paying consulting positions, leading to some instances in which officials facilitate approval for a project and then resign to work for the company (Kennedy 2012a). Beyond the ethical dilemmas this raises, some fear that the pilfering of local expertise undermines the regulatory capacity of local government, a problem amplified in a statewide political climate that emphasizes deregulation.

lation, cuts to public spending, and business-friendly policies, all of which have already strained the DNR (Stetzer 2011). As Governor Scott Walker has proudly declared, “Wisconsin is open for business.”

Concerned about how all of this impacts local democratic process, a resident of Barron County told me that “people feel cut out of the decision-making process . . . people who have more money have more influence” (personal communication, May 6, 2012). The corrosive influence of resource extraction industries on local control over land-use decisions and natural resources is not a new story (Gedicks 1993, 2001). Among other strategies that muzzle open discussion and debate, frac sand companies often include “nondisclosure” clauses in their leases or other agreements with landowners, preventing them from speaking publicly about the company’s activities. Another tactic is to offer “cooperation agreements” worth tens of thousands of dollars to residents living adjacent to a proposed frac sand operation in exchange for their support (Lyon 2012). Local officials in the Town of Menomonie were deeply unsettled when these contracts became public knowledge in June of 2012. One town official lamented that people would have to sign away their freedom of speech. “I just do not like people being told what they can say and not say,” she said. “That just kind of sticks in my craw” (Lyon 2012).

Grassroots Organizing

As one indication that frac sand is actually revitalizing local democratic process, dozens of citizens’ groups have formed throughout the region to challenge sand mining, with some attempting to organize regional networks. Few people now involved ever saw themselves as community organizers or activists, and few identify as environmentalists. Typically, a proposed mine or related operation triggers a person’s direct involvement, provoking a deep sense of concern and anxiety, a “moral shock,” with some people describing the radical disruption to the landscape as a form of personal loss. One woman in Barron County told me “it felt like there had been a death in the family” when she learned that a sand mine would be developed a mile from her rural home (personal communication, May 6, 2012). She has since become a key grassroots organizer and founding member of a group called Hills Angels.

While some community organizers have previous experience in grassroots activism, many do not. After realizing they will be directly impacted by a frac sand operation, they begin to study the issue and talk to their neighbors, setting the stage for an organized response. Almost inevitably, a group of neighbors seeks to work through existing channels of local government, testifying at public hearings and meetings and at other opportunities for public involvement in the decision-making process.⁶ Dozens of websites and online social networks have also been formed. Groups sometimes mobilize hundreds of community members at key public meetings and coordinate issues to be raised by those who speak in the public comment period. Many community groups have been crucial in helping small townships develop temporary moratoriums and licensing ordinances.

After the initial moral shock that triggers involvement, many people remain active in organizing efforts and quickly develop concern for broader, regional impacts. In 2007, for example, a proposed frac sand mine near Menomonie, Wisconsin, one of the first in the region, was successfully stopped by a group that rallied community support under the slogan “Save Our Hills.” When a sand mine proposal surfaced in a neighboring county, several people from Save Our Hills then helped to start the Concerned Chippewa Citizens, which has since evolved into the regional Save the Hills Alliance. As community organizers gain experience, similar regional networks have taken shape to facilitate sharing of information, experiences, and to coordinate larger actions. Some groups have even adopted more confrontational tactics. During an industry conference in October of 2012 in St. Paul, Minnesota, for example, protesters climbed on top of a chartered bus that was to shuttle conference attendees on a regional tour of frac sand mines. They delayed the tour until police arrived, unfurling a banner over the windshield of the bus that read “our tragedy is not your tour.”

The Politics of Landscape

Grassroots organizing has begun to cohere around shared symbols linked to defense of the rural landscape. As noted, many of community groups adopt names such as Save the Hills Alliance, Save Our Knapp Hills, and other slogans that invoke picturesque hills and bluffs. Such groups create a sense of shared identity and purpose through claims about the

Figure 1.

Frac sand opponents often display this or similar photos, taken by local filmmaker Jim Tittle, who is filming a documentary called “the Price of Sand.” This mine and processing plant is located in the Town of Red Cedar, near the City of Menomonie and UW-Stout. Photograph used with permission.



meaning of place and the aesthetic value of landscape. When concerned community members met to discuss a proposed thousand-acre mine in St. Croix County, one man stated that “We’re a town of 57 hills soon to be 52 if we don’t do something” (personal communication, June 18, 2012). Use of landscape imagery has also become ubiquitous, with critics deploying aerial photographs of frac sand mines at presentations, on websites, and in other documents to elicit a sense of disruption and spark concern (see Figure 1).

Opponents use this language and imagery to cast frac sand mining in threatening terms, often by emphasizing the rural landscape as source of local history, meaning, and community. While the physical landscape of mining “is a technological one,” as Rosalind Williams notes, “it is also a mental landscape, a social terrain, and an ideological map” (Williams 2008:21; cf. Bridge 2004:241). Mining thus serves as a metaphor for social disruption and the more general political economic pressures that rural communities endure today. This symbolic politics of landscape is starkly conveyed during debates over mining reclamation. State law requires proposed mines to submit a reclamation plan and financial guarantees, but critics routinely note that restoration of soil quality occurs in decades, not years. Even mining companies recognize this, and many reclamation plans propose post-mine land use involving “recreation” (golf courses, cross-country skiing, hunting,

etc.) or non-crop agricultural uses, such as animal grazing. During a public forum hosted by a frac sand company in Eau Claire County that I attended in March of 2012, community members relentlessly pressured the mine operator about reclamation, until he responded, “We’re restoring the land to agricultural land. It’ll be flat!” One woman replied, “Reclamation is a nice, sanitized word, but you can’t reclaim a hill!”⁷

Property: Rights, Value, Belonging

Frac sand has also stoked a broader debate about property rights, with some arguing that people can do whatever they want with their land, even if it creates problems for neighbors. Such debate illuminates deeper conflicts over the “social right” to indelibly transform shared landscapes, and how such a right is legitimized and secured (Bridge 2004:242). During the same public forum in Eau Claire County noted above, for instance, a heated discussion unfolded among community members over ideas about the common good versus individual rights. With many having ties to the community for generations, some argued that “we used to look out for each other and the community,” and when something “on your farm affected my land,” such disputes were resolved through a personal conversation “at the fence line.” A frac sand company owner with family ties to the area inter-

jected to defend the landowners who would lease their land for the proposed mine. "What gives you the right to tell Gerald and Christine what they can and can't do with their land?"⁷

In addition to serving as a bundle of rights, these debates also reveal underlying assumptions about property as a source of value. For landowners who discover that they are sitting on frac sand, property suddenly becomes a potential source of untold wealth. One woman from the Village of Knapp anguished over what to do when offered a lucrative leasing agreement, but eventually rejected the offer and helped start the Save Our Knapp Hills Alliance. Others, however, cash in, and few people blame them for doing so. As one frac sand opponent from St. Croix County said, "We can't blame the landowners. We all dream of winning the lottery and they just did" (personal communication, June 18, 2012). The idea that property is a source of value has also served as an important rallying point for opponents, who frequently note that frac sand operations cast a wide shadow, with industrial activities threatening to harm property values for numerous landowners near mining operations or along trucking routes. This criticism has gained significant traction, drawing into conflict some people's property *rights* with other people's property *values*.

Lastly, property has figured prominently in claims of belonging to a particular community affected by frac sand development. Local officials often dismiss public testimony by people who are not residents of their specific township, a practice that inflates the relative influence of taxpayers within town borders. Status as resident or property owner has come to anchor moral claims to defend the landscape on behalf of "the community," which people commonly invoke to frame mining companies as predatory outsiders. "If you want to find me, you'll find me at [address], not a UPS dropbox in Chippewa Falls," said one concerned citizen at a public hearing in Buffalo County (about 60 miles from Chippewa Falls). "My family has been here since the 1850s."⁸ Notions of property also appear in statements that position Wisconsin communities as defending the landscape from out-of-state corporations: "This whole thing is like a home invasion," said one Dunn County resident. "Do you negotiate with someone who invades your home? No. Don't negotiate, eliminate" (personal communication, June 16, 2012). Town politics in which the comments of property owners and resi-

dents are given more weight, and in which people criticize out-of-state companies, underscore the struggles over defining the boundaries and identity of the community to be involved in the decision-making process, a phenomenon documented in other disputes over mining (Ballard and Banks 2003).

Industry Tactics to Overcome Local Opposition

Many in industry did not anticipate the intensity of community opposition and conflict that has developed over the past two years. They have responded in diverse ways, with a handful of companies forming the Wisconsin Industrial Sand Association to lobby on their behalf and coordinate community outreach. In my experience, many frac sand spokespersons dismiss the concerns of critics as unscientific or lacking facts, sometimes stigmatizing opponents as "those people [who] are moved by emotions and fear," as one industry consultant explained during a public presentation, "as if miners are boiling kittens in hot oil."⁹ Dealing with community concerns is often approached as a public relations or marketing issue, something to be managed and overcome. As if part of an industry playbook, an influential law firm that represents frac sand interests advised that companies should adopt certain "strategies for dealing with moratoria" and community opposition: Companies should avoid litigation or threats of lawsuits, since it creates a negative public image, and instead "hold a press conference," "host a job fair," "have an open house," and "give away t-shirts."¹⁰ These strategies have been employed by a few mining corporations and bright-yellow "sand = jobs" t-shirts now periodically appear at public meetings.

As this suggests, some companies have worked to position themselves as "neighbors" and even community advocates. The representative of one Texas-based company, facing stiff community opposition to a proposed transload rail spur and mine, stated at a public hearing that "This is a community, and in it you got guys who want jobs driving trucks, who want royalties, who want to sell their land."¹¹ The family leasing their land for the proposed mine also adamantly defended the project. "We're dealing with a small company, but a good company, with good, strong Christian morals," said one landowner.¹² To further cultivate community relationships, some mining companies have launched extensive outreach efforts that

include donating money to schools and community organizations, donating sand for parks or activities, and paying mining employees to volunteer at community events.

In addition to manufacturing community consent, these efforts are part of a systematic campaign to normalize frac sand mining. The frac sand industry frequently notes, for instance, that sand has been mined in Wisconsin for decades and is used to produce numerous products that we rely on all the time and which are central to our industrialized society. This “nothing new here” campaign, and the notion that frac sand mining is beyond criticism merely because we use products made from sand, is routinely deployed to dismiss concerns. “A vast majority of products are made with silica sand,” explained one mine operator. “Even the abrasive compound in your toothpaste is made out of silica sand.”⁷

Efforts to normalize frac sand also extend to the mine itself. As Bridge (2004:242) argues, “the physical geography of mining landscapes can create a profound sense of dislocation,” provoking alienation and distrust. The mining landscape is associated with technological control but also destruction of the natural environment. Some companies routinely offer “mine tours” to local schools and community members, seeking to familiarize the radically unfamiliar landscape of mining. In my experience, the mine tour has a powerful impact on participants, who are presented with a seemingly mundane operation and told about minimal but easily managed impacts, framed by tour guides through narrow discourses of environmental sustainability and efforts to resignify the mined landscape as a space of nature. During one tour, presenters touted the use of solar panels, the reuse of water, trucks that run on compressed natural gas, and post-mine reclamation plans that entail planting wild grasses. In another instance, one spokesperson talked about the discovery of bats in an underground mine as part of how mining helps restore natural habitats.

Conclusions

Frac sand is paradoxically depicted as mundane but also as a source of unimaginable prosperity. One moment we are told “it’s just sand,” but in the next breath, through a seemingly “alchemic transition of mere dirt into wealth beyond the dreams of avarice” (Bridge 2004:241), frac sand is described as a mysterious and alluring commodity. As one journalist

writes, “the money associated with this magic mineral has proved intoxicating to landowners and small communities all over Wisconsin” (Lindfors 2012).

Not everyone accepts this form of commodity fetishism and the way it forces people to accommodate the interests of mining companies, sacrifice rural landscapes, endure new environmental health risks, and uncritically embrace unconventional energy development. Community opposition in Wisconsin has scored several recent victories and local groups have begun to organize regional networks, with some developing ties to anti-fracking activists in other parts of the country. These efforts have the potential to strengthen local democratic decision making and local control over land use and development. In my view, the challenge facing grassroots organizing is how to broaden its vision, alliances, and agenda beyond the immediate impacts of mining. Grassroots organizing has mostly centered on property owners reacting to proposed frac sand operations. The challenge now is not only how to preempt undesirable proposals but how to mobilize broader community involvement around principles of social and environmental justice.

Organizers need to create and sustain alliances with other community and social movement organizations. More importantly, they need to better illuminate the larger structural problems represented by frac sand mining, such as the corrosive power and influence of energy companies and interests; the need to protect or restore local democratic control over land use and resources; the promotion of community economic development that is environmentally sustainable and socially equitable; and the pursuit of alternative social and economic systems that reduce dependency on fossil fuels and take seriously the challenges of global warming. Lastly, grassroots organizers should continue to cultivate ties with a national movement against fracking, with the goal of mapping experiences and struggles unfolding along different points of the hydrocarbon commodity chain, experiences and struggles that are geographically dispersed and locally unique but united by shared structural conditions. Therein may lay the seeds of new forms of collective action.

Acknowledgments

This article has benefited from the financial support of a Faculty Research Initiative grant

awarded by the University of Wisconsin-Stout, as well as support provided by the Social Science Department and the Center for Applied Ethics.

Notes

1. I would like to acknowledge Stephanie Paladino for pushing me to clarify this standpoint.
2. The Wisconsin Center for Investigative Journalism has compiled an extensive list of proposed and existing frac sand mines, processing plants, and rail transload facilities. They have also mapped the location of these operations. See <http://www.wisconsinwatch.org/2012/07/22/map-frac-sand-july-2012/>
3. Workplace exposure to crystalline silica is regulated by the U.S. Department of Labor through the Occupational Safety and Health Administration (OSHA), the National Institute for Occupational Safety and Health (NIOSH), and the Mine Safety and Health Administration (MSHA). These agencies recently issued a hazard alert about worker exposure to silica at drill sites during hydraulic fracturing (OSHA/NIOSH 2012).
4. Mining companies routinely invoke MSHA, OSHA, and NIOSH oversight as evidence that silica dust is heavily regulated, downplaying unknown health risks for people living near frac sand operations and who may be exposed to crystalline silica over long periods of time in an ambient air setting. Some of the larger mining companies have begun their own monitoring programs and have pledged to share their findings with the Wisconsin Department of Natural Resources (WI DNR).
5. Dr. Crispin Pierce, Associate Professor of Environmental Public Health at the University of Wisconsin-Eau Claire, has been conducting research on silica health risks and has raised serious questions about the WI DNR's approach to this issue (<http://www.uwec.edu/CONHS/programs/enph/silica/silicaresearch1.htm>, accessed February 18, 2013).
6. Wisconsin has strong open meetings laws, but opportunities to influence local government vary tremendously. A zoned township, for example, may have to go through several steps to rezone land for a frac sand operation, allowing ample opportunity for citizen involvement at public meetings, while an unzoned township may swiftly approve a new mine in a single public meeting.
7. Public forum hosted by High Country Sand at the Eau Claire County Courthouse, Eau Claire, Wisconsin, March 28, 2012.
8. Buffalo County Board of Adjustment public hearing held at the Alma School Gymnasium, Alma, Wisconsin, July 24, 2012.
9. Comments made by Mark Krumenacher, Senior Vice President, GZA GeoEnvironmental, during his presentation at the Conference on the Silica Sand Resources of Minnesota and Wisconsin organized by the Precambrian Research Center of the University of Minnesota-Duluth and the Society for Mining, Metallurgy and Exploration, held at the Earle Brown Heritage Center, Brooklyn Park, Minnesota, October 2, 2012.
10. These "strategies for dealing with moratoria" were outlined in a presentation titled "Moratoria Madness: A Look at Wisconsin's Regulatory Climate," delivered by John Behling and Anders Helquist at the Proppants Summit: Overcoming the Shortage from Mine to Well, Denver, Colorado, July 23–25, 2012, and posted on the website of their law firm Weld, Riley, Prens and Ricci (<http://www.wrpr.com/Documents/Sand-Mining-Moratoriums.pdf>, accessed August 23, 2012). The presentation is no longer available on their website but has been reposted on The Frac Sand Frisbee (<http://fracsandfrisbee.com/wp-content/uploads/2012/09/Sand-Mining-Moratoriums.pdf>, accessed February 18, 2013).
11. Town of Menomonie Plan Commission public hearing and presentation by Vista Sand held at the Menomonie Town Hall, Dunn County, Wisconsin, April 24, 2012.
12. Comments made by Scott Teigan at a Town of Glenwood public hearing held at the Glenwood Town Hall, St. Croix County, June 11, 2012.

References Cited

- Ballard, Chris, and Glenn Banks
2003 Resource Wars: The Anthropology of Mining. *Annual Review of Anthropology* 32:287–313.
- Baran, Madeleine
2012 Frac Sand Sediment Spills into St. Croix River. *Minnesota Public Radio*, May 18.
- Bridge, Gavin
2004 Contested Terrain: Mining and the Environment. *Annual Review of Environmental Resources* 29:205–259.
- 2009 Material Worlds: Natural Resources, Resource Geography and the Material Economy. *Geography Compass* 3:1–28.
- 2011 Past Peak Oil: Political Economy of Energy Crises. *In Global Political Ecology*. Richard Peet, Paul

- Robbins, and Michael J. Watts, eds. Pp. 307–324. London and New York: Routledge.
- Brown, Curt
2012 Sand Mining Creates Wealth and Friction. *Star Tribune*, December 2.
- Christensen, Matt
2012 Wisconsin Won't Study Effects of Sand Mining. *Winona Daily News*, February 1.
- Cooperative Extension
2012 Study to Evaluate Groundwater Impacts of Frac Sand Mining, Irrigated Agriculture in Chippewa County. University of Wisconsin-Extension, August 15. <http://fyi.uwex.edu/news/2012/08/15/study-to-evaluate-groundwater-impacts-of-frac-sand-mining-irrigated-agriculture-in-chippewa-county/>, accessed April 8, 2013.
- Davies, Phil
2012 Sand Surge. *FedGazette: Regional Business and Economics Newspaper*, July.
- Deller, Steven C., and Andrew Schreiber
2012 Frac Sand Mining and Community Economic Development. Staff Paper No. 565, Department of Agriculture and Applied Economics, University of Wisconsin-Madison.
- Duley, Carl, and Steven Deller
2012a The Economics of Sand Mining and Buffalo County. University of Wisconsin-Extension. Executive Summary, submitted to the Buffalo County Board.
2012b The Economics of Sand Mining and Buffalo County. University of Wisconsin-Extension. Full report submitted to the Buffalo County Board.
- Freudenburg, William R., and Lisa J. Wilson
2002 Mining the Data: Analyzing the Economic Implications of Mining for Nonmetropolitan Regions. *Sociological Inquiry* 72(4):549–575.
- Gedicks, Al
1993 *The New Resource Wars: Native and Environmental Struggles against Multinational Corporations*. Boston, MA: South End Press.
- 2001 *Resource Rebels: Native Challenges to Mining and Oil Corporations*. Cambridge, MA: South End Press.
- Harnisch, Thomas W.
2011 Local Government Role in Regulating and Controlling Non-Metallic Mining Operations in Wisconsin: Toolbox for Towns Legal Handbook. Wisconsin Towns Association. <http://www.wisctowns.com/education/frac-sand>, accessed October 31, 2012.
- Kennedy, Tony
2012a For Regulators, Sand Mine Riches Are Tough to Refuse. *Star Tribune*, October 28.
2012b Local Officials Dealing Themselves a Piece of Frac Sand Boom. *Star Tribune*, December 26.
- Lindfors, Tom
2012 Frac Sand: The Magic Mineral. *New Richmond News*, Nov. 2.
- Lyon, Barbara
2012 Town Plan Commission Favors Rail Spur. *The Dunn County News*, June 9.
- McCurdy, Scott
2012 Silica Sand Processing: Water Quantity and Quality. Presentation given at the Conference on the Silica Sand Resources of Minnesota and Wisconsin, organized by the Precambrian Research Center, University of Minnesota-Duluth, and the Society for Mining, Metallurgy and Exploration, October 1–3, Earle Brown Heritage Center, Brooklyn Park, MN.
- Occupational Safety and Health Administration (OSHA), and the National Institute for Occupational Safety and Health (NIOSH)
2012 Hazard Alert: Worker Exposure to Silica during Hydraulic Fracturing, June. http://www.osha.gov/dts/hazardalerts/hydraulic_frac_hazard_alert.html, accessed October 25, 2012.
- Prengaman, Kate
2012a Wisconsin Frac Sand Sites Double. Wisconsin Center for Investigative Journalism, July 22. <http://www.wisconsinwatch.org/2012/07/22/sand-sites-double/>, accessed January 3, 2013.

2012b Frac Sand Boom Creates Thousands of Jobs. Wisconsin Center for Investigative Journalism, August 19. <http://www.wisconsinwatch.org/2012/08/19/sand-boom-creates-jobs>, accessed October 25, 2012.

2012c As Supply Meets Demand, Wisconsin's Frac Sand Rush Slows. Wisconsin Center for Investigative Journalism, December 15. <http://www.wisconsinwatch.org/2012/12/15/frac-sand-rush-slows/>, accessed December 20, 2012.

Smathers, Jason

2011 Sand Mining Surges in Wisconsin. Wisconsin Center for Investigative Journalism, June 31. <http://www.wisconsinwatch.org/2011/07/31/sand-mining-surges-in-wisconsin/>, accessed October 25, 2012.

Stetzer, Rod

2011 DNR Official: Staff Reductions Having Effect. The Dunn County News, December 6.

2012 Supply and Demand, Rail Availability Key to Sand Companies Fortunes. The Chippewa Herald, October 23.

WI DNR

2012 Silica Sand Mining in Wisconsin. Madison, WI: Wisconsin Department of Natural Resources. <http://dnr.wi.gov/topic/Mines/documents/SilicaSandMiningFinal.pdf>, accessed October 31, 2012.

Williams, Rosalind

2008 Notes on the Underground: An Essay on Technology, Society, and the Imagination. Cambridge, MA: MIT Press.

Wilson, Lisa J.

2004 Riding the Resource Roller Coaster: Understanding Socioeconomic Differences between Mining Communities. *Rural Sociology* 69(2):261–281.