



# FRAC SAND MINING: DESTRUCTIVE, UNSAFE, AND LARGELY UNREGULATED

Our nation is experiencing a rush of oil and gas drilling—a rush largely brought about by the use of horizontal drilling and hydraulic fracturing (fracking). Fracking involves pumping water, sand, and a chemical cocktail deep underground, to create cracks in shale formations and release the natural gas trapped inside. Millions of Americans live, work, play, and attend school on or near lands impacted by oil and gas development, and there is growing evidence that this fossil fuel development is associated with adverse health risks due to air, water, and soil pollution.

But the impacts of fracking aren't limited to those who live near drilling sites. To frac[k] wells, companies inject fluids as well as “proppants” to hold open the fractures that are created. The most common proppand is specialized silica sand, which must be mined, treated, and shipped to the drilling site. The frac sand boom has hit the Midwest particularly hard, and residents of affected states have discovered that frac sand mining poisons our air with carcinogenic particulate matter, disrupts quiet rural life with incessant noise and truck traffic, and destroys beautiful landscapes.

## DESTRUCTIVE MINING

Companies use sand to keep rock fractures propped open, so that the natural gas keeps flowing. But not just any sand makes for a good proppant—gas companies require super-fine, high-quality crystalline silica, an extremely small and hard type of sand that can withstand intense pressures. Such silica is abundant in the scenic bluffs of Wisconsin, Minnesota, Illinois, and Iowa, and this is where most mining is occurring. Fracking a single well one time can require over one million pounds of silica, and wells are often fracked several times.

Mining, treating, and shipping frac sand have destructive effects on rural communities and natural landscapes. To extract silica, mining companies level bluffs and hills, replacing them with massive holes 100 feet deep. The purest silica is then isolated, which involves washing the sand with millions of gallons of chemical-laced water. Finally, an armada of trucks transports the silica to fracking sites around the country. Residents of small towns in Wisconsin and Minnesota have reported hundreds of frac sand trucks pass through their communities each day, with one resident of New Auburn, Wisconsin, counting 900 during an eight-hour period.

## AIR POLLUTION AND HEALTH IMPACTS

The silica used in fracking is no ordinary sand—it's far more dangerous. Fracking uses tiny, nearly invisible particles

of silica dust, which are small enough to enter our lungs when we breathe. And once inhaled, this particulate matter remains permanently in the lungs. Crystalline silica dust can cause lung cancer, asthma, mesothelioma, and silicosis, a disease marked by lung tissue scarring. These cancers and diseases have long latency periods, meaning it could be decades before we see the full health effects of the frac sand boom.

Throughout the mining, transportation, and fracking processes, huge amounts of silica inevitably escape into the air, putting both workers and nearby communities at risk. Workers at mining and fracking sites are typically required to wear respirators and take other precautions, but a team of researchers with the National Institute for Occupational Safety and Health (NIOSH), tasked with investigating chemical hazards for gas industry workers, found unsafe levels of silica in four-fifths of air samples at 11 fracking sites. One-third of the samples had such high silica levels that normal respirators wouldn't offer enough protection. Last year, the AFL-CIO urged the Occupational Safety and Health Administration to develop new standards for silica exposure.

Meanwhile, sand mines are being developed at a rapid pace, frequently near homes and schools, even though there's been little research on the health impacts of mining on surrounding communities. The federal government does not regulate exposure to silica dust for those living near frac sand mining, and neither do most states. Wisconsin has more than 100 frac sand mines, but when residents petitioned the state's Department of Natural Resources last year to list crystalline silica as a hazardous air contaminant and implement emissions standards, the Department declined.

### **WATER POLLUTION AND USE ISSUES**

Frac sand mining, like other aspects of fracking, wastes enormous quantities of water and risks the contamination of local drinking water supplies. Fracking can require up to 10 million gallons of water per well at the well site, and frac sand mines exacerbate gas production's water footprint, consuming 500,000 to 2 million gallons per day for transporting, cleaning, and storing purposes. This rampant water use could become especially problematic in



*A FRAC SAND MINE IN CHIPPEWA COUNTY, WISCONSIN  
(PHOTO BY MARY KENOSIAN)*

water-scarce Texas, where frac sand mining is increasingly common.

Furthermore, the chemical-laced water used to clean silica needs to be stored and safely disposed of after use, which creates several risks. This wastewater can contain traces of 1) acrylamide, which can damage blood and the nervous system, and 2) diallyldimethylammonium chloride, which can lead to the formation of the suspected carcinogen N-nitrosodimethylamine in the presence of water disinfectants (chloramines). Frac sand containment ponds have been known to leak wastewater into rivers and streams, threatening families that depend on these waterways for drinking and recreation. One 2012 leak in Wisconsin allowed wastewater and sediment to pollute the St. Croix River and wetlands near the Minnesota border.

### **SOLUTIONS**

In every state where frac sand is being mined, communities have urged local governments to enact bans or moratoria, at least until scientists conduct further research on its health and environmental impacts. The Sierra Club supports local efforts to ban or temporarily halt frac sand mining, including those of its Wisconsin, Minnesota, and Illinois chapters. Likewise, federal and state regulators must pay closer attention to the environmental and health risks of frac sand. More broadly, we must recognize that this issue isn't an isolated concern—it's one more indication that natural gas production is a dirty, dangerous, and poorly regulated industry with adverse impacts at the national level.

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