

Richland County Zoning and Land Information – Frac Sand Mining Advisory Committee

Meeting Reference Executive Summary

10/25/13-1/20/14

The Richland County Zoning and Land Information Committee created a Frac Sand Mining Advisory Committee (FSAC) in September 2013. (The committee differentiates industrial frac sand mining from current gravel pit operations in the county.) The advisory committee's mission is to research the impact that industrial open pit frac sand mining may have on Richland County and to recommend revisions to the Richland County zoning ordinance if necessary. This document presents a summary of information on industrial frac sand mining discussed at FSAC meetings as of January 20, 2014.

The FSAC began public monthly meetings in October 2013. Each month the committee reviewed a different topic. The committee also received an information packet on frac sand mining ranging from newspaper articles to published reports. Below is a listing of the topics and presenters, followed by a summary of information made available to the committee.

- October – Location of Frac Sand in Richland County; Duane Simonson, Geologist
- November – Air quality and health issues related to silica sand dust; Rob Thiboldeaux, Bureau of Environmental and Occupational Health at the Wisconsin Dept. of Health Services
- December – Water use and water table issues associated with high capacity wells; Madeline Gotkowitz, Hydrogeologist, Wisconsin Geological and Natural Survey, Associate Professor, UW Extension
- January – Economic impact of frac sand mining in Trempealeau county; Patricia Malone, Community Development Educator, UW – Extension, Trempealeau County

Geology. Richland County is located in the Driftless Area of Wisconsin. The Driftless Area contains deeply carved river valleys, majestic bluffs, rock outcroppings, springs and caves. This landscape is fragile and the reason for this can be stated in one word: karst.

Karst refers to a type of limestone or dolomite bedrock that has been made permeable by the action of slightly acidic rainwater. Over thousands of years this acidic water dissolved the surface and any fractures in the limestone, creating openings in the rock that formed a complex of underground drainage channels, caves, tunnels, shafts, and other karst characteristics. These networks provide groundwater a fast moving complex of underground streams, waterfalls and springs, which quickly find their way to the region's aquifer, or often back to the surface again.

In other types of aquifers, groundwater moves very slowly – maybe a foot a day – but in karst aquifers, flowing water can move up to 300 feet a day. This means that karst areas are extremely vulnerable to groundwater pollution, because contaminants can reach the water supply before it has had time to become purified. Volatile compounds, bacteria, and other pollutants can collect in underground currents and migrate into wells, springs and upward into homes and schools.

Geologist Duane Simonson described the bedrock stratigraphic units of Richland County, which has three strata where frac sand can be found: St Peter, Jordon and Wonewoc. The total frac sand in Richland County is 18.5% of total bedrock. For comparison, frac sand is 25% of total bedrock in Jackson County, which has active industrial frac sand mines.

Public Health. Public health issues in regard to frac sand mining include worker safety, community conditions, air and water quality, and prevention of or emergency response to catastrophic mining events, which pose a danger to community residents or workers.

Silica Sand. Silica sand is a known carcinogen. It is considered a serious threat to human health by state and federal occupational health and safety agencies. Air pollution specialist Rob Thiboldeaux from the state health department shared information and showed images on how silica sand is similar to tiny pieces of glass that destroy lung tissue, leaving scars so lungs are unable to take in oxygen. The damage is known as silicosis, which is irreversible, causing susceptibility to breathing problems, chronic lung infections, lung diseases including cancer, and other immune diseases.

Air Quality. Because mines can be sited near homes, “fugitive dust,” or dust that isn’t contained during mining, processing or transport, can reach the lungs of citizens and potentially cause harm, especially to the most vulnerable residents, such as children or the elderly. Unfortunately, violations have been occurring in Wisconsin. Almost 20% of Wisconsin’s 70 active frac sand mines and processing plants were cited for environmental violations in 2012, including exceeding particulate matter.

In addition to silica, increased particulate matter from diesel exhaust due to heavy equipment and trucking exacerbates the potential danger to lung health, including allergies and asthma, again, especially among children and the elderly who are more susceptible to serious complications

Water Quality. Water pollution is a major public health concern for Richland County, which is rich in water resources but has a special consideration due to our geology. UW-Extension Hydrogeologist Madeline Gotkowitz presented information about water quantity and briefly touched on water quality. If frac sand mines were located above the water table, the only source of pollution would be unregulated discharges into surface water, leakage from storage ponds and storm water overflow. The discharges could travel quickly and unexpectedly due to karst geology.

Six out of 10 Richland County citizens rely on private wells, which are not monitored for pollutants as are community water sources. Overflows or discharges could be very damaging but undetectable until too late. Such discharges may include flocculants (acrylamides) used in the frac sand washing process. Waste sand contaminated with these chemicals may be returned from processing sites and left at mine sites, creating a pollution risk for decades to come.

In June 2013, six companies were working with the DNR on storm water violations. The DNR said that in each case, sediment-laden storm water left the site and reached surface water somewhere else. According to Deb Dix, WI DNR, in Trempealeau County there have been five frac sand mining operation violations that have been sent on to the Department of Justice.

Groundwater and recycled water are used to wash the sand, keep fugitive dust controlled, and replenish evaporated water. Impacts on the local water supply can occur in multiple areas.

Water Level. Based on 100,000 tons of frac sand production/month in Chippewa County, it took 2,000-3,000 gpm (gallons per minute) to wash sand in a “closed loop” system where water was recycled and reused. An additional 150 gpm of groundwater was pumped to make up for evaporation, infiltration (into the earth) from ponds without liners, and water trucked away in wet sand. A well in Wisconsin is “high-capacity” if pumping >70 gpm. Typical municipal, industrial or agriculture supply wells pump 100-1500 gpm. Groundwater withdrawals can impact neighboring wells and also the baseflow of creeks.

Surface Water. Impacts could include overflow (permitted or unintended) to neighboring creeks and wetlands, and potential impacts on surface water quality as discussed in the previous section.

Groundwater Recharge. Groundwater recharge rate can be impacted by holding ponds, infiltration ponds, (which capture and hold rainwater) and processing water. Reclamation conditions including topography, land use, and soil type also impact recharge.

Light and Noise Pollution. Residents near frac sand mining, have identified light and noise pollution as degrading their quality of sleep. A frac sand mining operation is a noisy operation due to equipment, trucking and blasting. If activity continues after daylight hours, mines require high-powered lights near operations and equipment hubs. Light and noise pollution can be very high.

Heavy Truck Traffic. Public health issues related to frac sand mining include safety concerns regarding increased truck traffic for residents living near frac sand operations and frac sand trucking routes. Trucks carrying explosives should not run during school bus runs.

Economic Impact of Frac Sand Mining. Community Development Educator Patricia Malone was able to shed some light on the impact of frac sand mining in Trempealeau County (TC). Currently, TC has five mines in operation, three rail spurs and has issued 26 permits covering over 5500 acres under permit. The number of jobs created by the frac sand mining versus number projected is much smaller: 65 versus 205. Some of the operating mines have been annexed by cities so the direct economic benefit to the county is hard to determine. However, in one case the Town of Blair annexed a frac sand mine that included a processing facility and a trans load facility, and saw their school aid drop by \$500,000. The mining company Preferred Sands gave the city \$230,000 in lieu of taxes to help offset their loss in school aid. Another impact has been in the area of construction of new homes in the frac sand corridor: no new building permits have been issued near frac sand mining. TC holds many national biking tours. They are now rerouting those tours away from the frac sand mining area in the county. The impact on the roads has been mostly on the state highways so TC must wait for the state to repair the roads.

Upon review of the materials and presentations made by the experts the next step was to review current county ordinances and permits to determine if they were adequate for industrial open pit frac sand mines. At the January 2014 FSAC meeting, a sub-team was created to develop draft revisions of the zoning ordinance, mining reclamation ordinance and applicable regulations impacting frac sand mining in the county.