

# Airborne Particulates Around Frac Sand Plants Using EPA-Certified Instruments

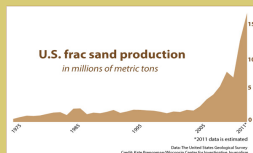
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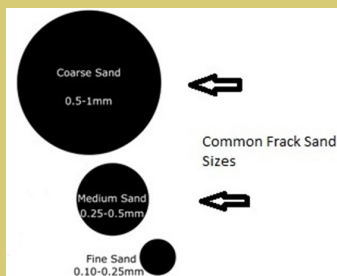
## INTRODUCTION

- Hydraulic fracturing, or fracking, is a popular method for extracting natural gas from shale deposits below the earth's crust.
- The geology of Wisconsin has optimal sand deposits for the process.
- Frac sand is used during extraction as a proppant to hold open the fractured shale during removal of natural gas.
- "Freshly-fractured" silica appears to be 2 to 5 times more reactive with animal lung tissue than "weathered" silica, though weathering occurs within several days & with exposure to water.
- Numerous reports of dust accumulation at people's homes & businesses have led to an increased need to investigating air quality surrounding those frac sand facilities.



## Health Impacts

- Fine particles including silica, PM 2.5 lodge deep in the lungs & can enter the bloodstream causing:
  - Damage to alveoli in the lungs.
  - Lung cancer
  - Silicosis;
  - Tuberculosis
  - Kidney disease
  - Autoimmune disease
- Larger sized particles can become lodged in our throats, preventing them from entering the deep lung.

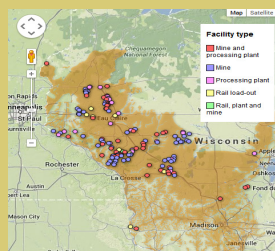


## Hypothesis

The data collected by EPA-certified instruments will continue to reflect concerns with elevated PM2.5 levels from our previous measurements.

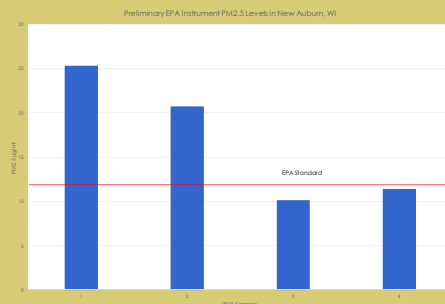
## Methods

- 24-Hour ambient air samples were collected in Bloomer, WI and New Auburn, WI on 18 dates using an EPA-approved monitor.

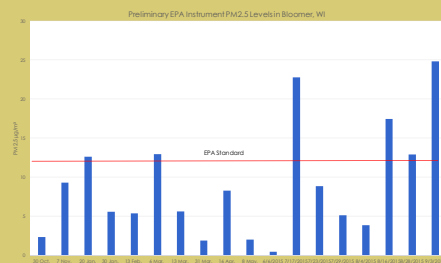


## Results

- PM<sub>2.5</sub> levels using the EPA-certified sampler averaged 16.9 µg/m<sup>3</sup>



- PM<sub>2.5</sub> levels using the EPA-certified sampler averaged 9.02 µg/m<sup>3</sup>



## Conclusion

- EPA-certified instrument found PM<sub>2.5</sub> levels were consistently higher than the DNR background levels. Average level in New Auburn was 16.9 µg/m<sup>3</sup>, in Bloomer it was 9.02 µg/m<sup>3</sup>, compared to the EPA average standard of 12 µg/m<sup>3</sup>

## Next Steps

- Co-locate our monitors at the Eau Claire DOT sampling site.
- Expand monitoring to Black River Falls, WI and Augusta/Bridge Creek, WI.



## References

- Wisconsin Center for Investigative Journalism. (2013). *Frac sand mines and plants, October 2013 update* [Data file]. Retrieved from <http://www.wisconsinwatch.org/wi-frac-sand/>
- Pierce, Crispin H., Kristin Walters, Jeron Jacobson, and Zachary Kroening; PM2.5 Airborne Particulates near Frac Sand Operations; *J Environ Health*, Featured article Nov. (2015)

## Acknowledgments

UW-Eau Claire Office of Research & Sponsored Programs, University of Iowa Environmental Health Sciences, University of Wisconsin-Stout.