

PM<sub>2.5</sub><sup>2</sup>

Alto trombone and fixed electronics

5 minutes

Brooke Joyce (2023)

Premiered by Michael Smith, October 2023

Program Note:

"Particle pollution, or particulate matter, consists of particles that are in the air; including dust, dirt, soot and smoke, and drops of liquid. Some particles, such as soot or smoke, are large or dark enough to be seen. Other particles are so small that you cannot see them. Particles that are 2.5 micrometers in diameter or smaller are known as Fine Particulate Matter or PM<sub>2.5</sub>. A typical human hair is 70 micrometers in width, which makes the Fine Particulate Matter about 30 times smaller than the width of a hair strand. Their small size allows them to get into the deep part of your lungs and even into your blood." ([tracking.idph.iowa.gov](https://tracking.idph.iowa.gov))

This composition uses 30 data points gathered during the month of June in 2023 when smoke from Canadian wildfires drifted into the northern US. Each data point, representing the average measurement of PM<sub>2.5</sub> in the atmosphere of Iowa on a particular day in June, were scaled and then mapped onto an EQ filter that modified a field recording made in rural Winneshiek County, Iowa. The data points also affect a digital distortion filter also heard in the field recording. As the PM<sub>2.5</sub> values increase, the field recording rises in pitch and level of distortion. The pitch material heard in the alto trombone is derived from aspects of the Eb overtone series.

Mutes required

Plunger, harmon (stem in and out), bucket

Coordination of live and electronic sounds

The timings in the score are only guides--nothing needs to be specifically synchronized. It may be advantageous for the performer to have a time-keeping device visible during the performance in order to easily coordinate.

Placement of speakers and balance

Depending on the performance space, it may be advantageous to have the electronic sounds surround the audience, or it may be better to have the sounds emanate from the area closest to the instrument. Once the audio level is set for the performance, it should not need to be altered.