

Particulate Matter Pollution in Philadelphia and its Association with Asthma Exacerbations

Jeffrey Field, PhD

Abstract

Hydraulic Fracking in Pennsylvania has created millions of gallons of toxic water waste both within Pennsylvania and in surrounding states. The water is so toxic that it cannot be disposed in public treatment facilities, but it is partially cleaned, reused and after it is no longer capable of being reused, is finally injected deep underground. We have been using a geographic information system (GIS) to map both the liquid and solid waste streams from fracking in Pennsylvania. Little is known about potential health effects of those exposed to it, as they are complex mixtures of fracking solutions containing dozens or thousands of compounds and the brine created by dissolved solids from rocks. We propose to (1) create a panel of toxicology reporters that respond to the major cellular stress pathways and then use the panel to screen water samples from affected communities, and as they become available, fracking wastewater samples. (2) We will build a second panel consisting of cell death modulators to be tested with samples of fracking wastewater to determine the mechanisms underlying cytotoxicity. We will obtain the samples by creating a network of community partners to send samples. We will organize the data using GIS software to map the origin of the samples, which will be integrated with our maps of the fracking waste disposal sites and locations of wells.