

From: Larysa Dyrszka
Sent: Wednesday, November 20, 2013 1:56 PM
To: ord.docket@epa.gov; Hanlon, Edward
Subject: submitting oral comments

Dear Mr Hanlon,

Thank you again for the opportunity to participate in the EPA teleconference.

My oral comments are attached, and also pasted below. I didn't get a chance to finish my oral comments, so would you kindly pass this on to the SAB members?

Larysa Dyrszka MD

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EPA November 20, 2013
Oral comments

Thank you for this opportunity to address the Science Advisory Board on water impacts from gas drilling. I'm a pediatrician, and I have been compiling information on this issue from the health perspective for five years. There are a couple of issues on which I'd like to comment.

The first is about **environmental justice** which Section 2.2 of the EPA document entitled, *Study of the Potential Impacts of Hydraulic Fracturing on Drinking Water Resources: PROGRESS REPORT* <http://epa.gov/hfstudy/pdfs/hf-report20121214.pdf> addresses.

In reviewing gas development in the northeast, I looked at counties with poor health outcomes already, and it appears that several of those counties have large-scale gas development. It has been documented that people who are already under stress because they are sick or poor suffer environmental stress with greater difficulty. And that is the reason for addressing environmental justice as President Clinton did.

In his Executive order 12898 (http://www.epa.gov/region2/ej/exec_order_12898.pdf) President Clinton ordered each Federal agency to make achieving environmental justice part of its mission by identifying and addressing disproportionately high and adverse human health or environmental effects of its programs and activities on vulnerable populations. Further, in section 3, the President ordered that any research shall include diverse segments of the population in epidemiological and clinical studies, including segments at high risk from environmental hazards, such as minority populations, low-income populations and workers who may be exposed to, substantial environmental hazards.

Analyses shall identify multiple and cumulative exposures.

The federal agency shall collect, maintain, and analyze information assessing and comparing environmental and human health risks borne by populations identified by race, national origin, or income, and they shall use this information to determine whether their programs, policies, and activities have disproportionately high and adverse human health or environmental effects on minority populations and low-income populations; and shall collect, maintain and analyze information on the race, national origin, income level, and other readily accessible and appropriate information for areas surrounding facilities or sites expected to have substantial environmental, human health, or economic effect on the surrounding populations, when such facilities or sites become the subject of a substantial Federal environmental administrative or judicial action. Such information shall be made available to the public ... (http://www.epa.gov/fedfac/documents/executive_order_12898.htm).

The public, especially the residents living nearby, need to know whether this project is in compliance with this Executive Order of President Clinton.

I was surprised that the EPA was unable to determine the impact on vulnerable groups. States maintain location data for all permits and wells drilled, so it is not necessary to depend on company information or FracFocus, an industry-related enterprise. EPA could also have looked to the data compiled by FrackTracker Alliance, a non-governmental organization <http://www.fracktracker.org/>. There you can find the well sites, waste treatment facilities, and for some states, the water withdrawal locations. River Basin Commissions have accurate data on water withdrawals, so if your study area is part of such a river basin commission, that data on water withdrawals is available.

The EPA should also be familiar with the County Health Rankings, a project of the University of Wisconsin and Robert Wood Johnson Foundation <http://www.countyhealthrankings.org/>, with annual data reported. Although specific communities are not identified or ranked in this system, at the very least the EPA would be able to begin looking at the

counties with poor health outcomes and concentration of wells. Addressing vulnerable population needs and environmental justice concerns should be a priority in any federal study.

I would also request that you access the EPA's data set on radon, on a county-by-county basis. In a large number of counties where there is gas drilling in the Marcellus, radon is already averaging at 4picocuries/L. These people are therefore at higher environmental risk, and should have necessary attention.

(<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3621574/>). There is an Australian study from 2013, and the lead author is Douglas Tait—and the point was to predict GHG emissions using radon as a tracer. What they found was a ~3 fold increase in maximum ²²²Rn concentration inside the gas field compared to outside of it. There was a significant relationship between maximum and average ²²²Rn concentrations and the number of gas wells within a 3 km radius of the sampling sites. I suspect there might be a similar finding over the Marcellus shale.

You refer to the five **Case Studies** in the interim report, from Colorado, North Dakota, Pennsylvania, and Texas. You collected water samples from over 70 domestic water wells, 15 monitoring wells, and 13 surface water sources, among others. This research will help to identify the source of any contamination that may have occurred.

I was wondering if you also surveyed the people living near these sites regarding their health. It would be a very good opportunity to relate health with water impacts. And if there are health impacts, it would be important to establish a pathway of exposure. This scientific information is fundamental to making informed decisions about the process.

Health studies already completed by others, Dr Theo Colborn, the Univ of Colorado School of Public Health, Univ of California at Irvine-- indicate that significant negative health impacts occur near gas exploration and production activities. But water impacts are just one part, perhaps even the smaller part, of residents' health complaints. From completed studies, as well as from NGO-led research, and through conversations with residents near gas drilling sites, it is becoming apparent that health is significantly negatively impacted via the inhalation and dermal route.

My colleagues published a series of cases in a peer-reviewed journal.

Here are two of them...In one of the homes, a child became ill with fatigue, confusion, abdominal and back pain. After several animals in the household had died, the doctor tested for toxins and it revealed arsenic in his blood. The family then stopped drinking the water and he eventually recovered, having lost a year of school. There were 25 wells within two miles of the home, and there was also an aerated impoundment, and two compressor stations within a mile. Other family members had phenol, a metabolite of benzene; symptoms included extreme fatigue, headaches, nosebleeds, rashes, and deficits of smell and hearing. Were it not for the deaths of the animals, the human health effects would not have been diagnosed.

Last year I travelled to Paradise Road in Wyalusing, Bradford County to speak with people who already had contaminated water--and visible water buffaloes. The couple hosting this gathering was expecting a baby... A few months later the baby was born with a cardiac defect. No causality is suggested, however, there is no monitoring or surveillance plan in place to study this.

There are many more such cases, and they fit the criteria of having been impacted by an environmental toxin nearby: **a temporal relationship, plausible exposure, and absence of a more likely explanation.**

Recently I spoke with several families, and here are two stories.

The first family was well, with five children who were good students, and excellent attendance records--until 2008 when two gas compressors were placed on the hill above their home, about 600 ft away. That year five gas wells were spudded and fracked on another hilltop, less than a quarter mile away from the house, plus a glycol dehydrator and a sludge tank.

Since 2008, there have been chlorine-like, and at other times sweet-smelling odor events. They may be preceded by a vapor mist with tiny bubbles that comes downhill from the compressors. It is difficult to breathe. Significant health impacts occur after such events.

Both 12 yo twin sons, developed headaches, rashes and behavior changes. They began missing school and were difficult to manage. Last year both began with tic-like involuntary movements and seemed to lack coordination. They had a neurological work-up and got anti-seizure medication. Both have recently been evaluated by the Individualized Education Program (IEP) team at school because of poor performance.

A 13 yo son suffers from severe headaches for which he is medicated, and he has lost days of school. His bedroom faces the compressors and so he receives the most noise and he is now very sensitive to any noise. When the compressors are running, which is most of the time, the family describes the noise as similar to ten trains. The blowdowns occur without notice. Since last week he has had abnormal movements and just had an EEG and was also started on anti-seizure meds.

An 18 yo daughter began having behavior problems and slowed speech at age 16. An evaluation by the neurologist included an EEG and MRI, and revealed that she had had a stroke.

A 20 yo daughter who was married last year, has headaches, abnormal hand movements, leg pain and memory problems.

The mother, also previously healthy, has had stomach problems and she has lost about 50 lbs. In 2010 a very strong chlorine-like smell "took her breath away"; she was exposed for about 2 to 3 minutes. She felt ill immediately and shortly after developed congestion, and blisters in her nose, on her neck, face and arms. About three months later, because she was pale and had continued blistering of the mucous membranes, she returned to the hospital where health professionals recommended that the family evacuate the house and also a Hazmat team visit, but none appeared. The mother has also seen the neurologist for weakness, memory problems, trembling hands and a feeling described as "bugs crawling on the skin". She has been diagnosed with polyneuropathy and is on medication.

The grandmother has hypertension and tachycardia, and is on medication.

In 2010 the mother and grandmother both had blood work for environmental toxins. The grandmother and mother had phenol, benzene, arsenic, and cadmium in their blood. The children were not tested.

All the family members have had rashes which come and go.

On July 3rd this year there was a strong sweet-smelling odor event that was followed by rashes in the boys who had been playing outside. One boy developed a boil in the groin which improved, over months and after two rounds of antibiotics, but recently another boil developed. The other boy developed a boil and cellulitis in the axilla this past week. They never had such infections.

On the opposite hill with the five gas wells, there were two frack ponds in 2008. In early 2009 a neighbor whose house overlooked the ponds noticed that a creek that runs between his house and this family's suddenly flooded and the water in the creek turned black. This creek runs 15-20 ft from their yard.

There is a small dog owned by the grandmother who was seen licking his paws after he had been outside, and then he would vomit. The dog no longer wants to go outside, especially when the decking is moist from rain or what appears to be dew, but could be the vapors that come down the hill from the compressors, and most often noticed in the evenings, and also cover the house with a moist film. The grandmother separately noticed that when she took the plant covers from her tomatoes, that covering, which often had some moisture on it, burned her hands.

The family has not been evaluated by any public health agency.

The second family works in the industry. The husband does construction work as a sub-contractor. In one episode, his crew was in a blowback; a foggy material was released and covered the ground, and a burning fluid sprayed his workers. He had no idea what the material was, and they were not wearing any protective gear. There was no follow-up.

But the story is about his wife. About five years ago, the wife took a job painting glycol dehydrators, well heads, brine tanks and other infrastructure on working well sites and compressor stations. Immediately following one of the first jobs, as she started the drive home, she felt nauseated, developed a severe headache and sore throat and by the time she got home she was covered in a rash on all the exposed parts of her body. Eventually some of the red rash developed into open sores. These came and went. The husband reports that she has scars from these sores. The wife stopped going on these jobs after several of these episodes. Then, she started to have behavior changes—irritability and forgetfulness. She has now been diagnosed with dementia, and is in a doctor's care and being medicated. About four years ago she developed an excoriated area on the top of her ear, which seemed never to completely heal. At this point, the top of her ear is gone, and two days ago the lesion was biopsied for cancer. Her case has never received attention from any public health agency.

Having spent time speaking with these impacted people, I am convinced that the health of many of them living near gas wells, processing plants and compressors is deteriorating and that it is a result of gas drilling activities. These people were well before this industry moved in, and now they are not, and there is no other plausible reason for their illnesses. Given that exposures and illness increase over time and given that many instances of contamination and illness related to fracking never come to light due to non-disclosure agreements with the industry, I am afraid that this is the just beginning of a huge public health crisis. I believe that some have irreversible neurological problems already.

I would ask that those in the federal government, who can initiate such studies, allocate funds for the study of air near gas drilling operations and infrastructure, and to include the air impacts on residents near gas drilling development. Breathing is mandatory, and, while a drinking water source might be replaced, air cannot.

Larysa Dyrszka MD