Talking Points DRBC March 13 2019 Meeting

HEALTH IMPACTS FROM FRACKING:

1. The Concerned Health Professionals of New York and the Physicians for Social Responsibility released the Fifth Edition of ***The Compendium of Scientific, Medical, and Media Findings Demonstrating Risks and Harms of Fracking*** ("the Compendium") in March 2018, an authoritative report that examines the impacts of fracking on the environment and public health. The Compendium analyzed over 1,200 peer reviewed research articles on the impacts of fracking, many of the reports focusing on the Marcellus and Utica Shale formations, the same gas-bearing geology found here in the Delaware River Basin. These formations, located in Pennsylvania, are also most likely the source of fracking wastewater that would be imported to the Delaware River Watershed for disposal if the DRBC does not ban wastewater imports.

   The Compendium concludes: "…findings to date from scientific, medical, and journalistic investigations combine to demonstrate that fracking poses significant threats to air, water, health, public safety, climate stability, seismic stability, community cohesion, and long-term economic vitality. Emerging data from a rapidly expanding body of evidence continue to reveal a plethora of recurring problems and harms that cannot be sufficiently averted through regulatory frameworks. There is no evidence that fracking can operate without threatening public health directly or without imperiling climate stability upon which public health depends." (psr.org/resources/fracking-compendium.html p. 266)

   The reports and studies included in the Compendium assess the potential for harm from fracking and its activities and examine the adverse health effects being experienced by people who live in communities where fracking, fracking-related operations, processing, and infrastructure is occurring, including Pennsylvania. **The overwhelming evidence is that fracking presents a public health hazard that cannot be averted, no matter what regulations are devised; the only way to control the harm is to prohibit fracking and its activities on the precautionary principle.** This information is critical for the Delaware River Basin Commission to

consider because human health is an essential consideration of the Commission and inextricably connected to the quality of the Basin's water resources and ecosystems.

2. In an extensive article about the Compendium, in March 2018 Rolling Stone Magazine reported that the researchers behind the report pointed out that fracking extends far beyond a single well but is, more accurately, part of a complicated extraction process with an infrastructure that extends across entire regions. **"At virtually every turn, the process contains public health hazards. Residents living near an active site breath air laced with carcinogens, including benzene and formaldehyde, and research has shown an increase risk of asthma, a decrease in infant health and worrisome effects on the development of a fetus, such as preterm births and birth defects",** reports the Magazine.

3. **Wastewater produced by fracking activities contains a chemical mix that is complex, variable, and contains dangerous constituents and properties; in some instances what is in the fluids used in fracking, which are contained in the waste stream, is kept secret, even though it could be toxic. It is known that many of the constituents are carcinogenic, some have known adverse health effects, and some are toxic to aquatic life and plant life** including: biochemical oxygen demand (BOD), bromide, chloride, chemical oxygen demand (COD), specific conductivity, sulfate, total dissolved solids (TDS), total suspended solids (TSS), barium, potassium, sodium, strontium, benzene, ethylbenzene, toluene, xylenes, sulfide, gross alpha, gross beta, radium 226, and radium 228, according to the U.S. Environmental Protection Agency.

4. It is known through sampling of wastewater produced by fracking that the Marcellus Shale formation and other shale gas deposits are highly radioactive, resulting in a waste stream that contains dangerous radioactive materials. A Duke University study of a stream in Pennsylvania below a frack wastewater processing plant found radium 226 levels in stream sediments at the point of discharge were ~200 times greater (544−8759 Bq/kg) than upstream sediments and background sediments

(22−44 Bq/kg) and above radioactive waste disposal threshold regulations. **Radium 226 has a half-life of 1600 years and is a known carcinogen. Once it is released into the environment by being brought to the surface by fracking, it is a health hazard for generations to come.**

5. Yale University School of Public Health, in a study of chemicals used in fracking, found that of the 119 compounds with sufficient data to classify them in terms of carcinogenicity (only 20% of chemicals in use had sufficient data – a problem in itself), "44 percent of the water pollutants and 60 percent of air pollutants were either confirmed or possible carcinogens." 55 unique compounds with carcinogenic potential could be released to both water or air and 20 chemicals had evidence of increased risk for leukemia or lymphoma specifically. **DRBC will not be able to control which chemicals companies use to frack wells and which chemicals end up in the wastewater that is produced, resulting in the exposure of people to these dangerous chemicals, risking harmful health effects.**

6. USEPA reports that spills, leaks, and releases of frack wastewater occur, citing a study that says wastewater is one of the top 3 materials spilled in fracking activities, including during transportation of wastewater. EPA documents that these releases have negative impacts on water quality and aquatic life; the harm can persist for years after a spill. **It has reported that "health effects associated with chronic oral exposure to these chemicals include carcinogenicity, neurotoxicity, immune system effects, changes in body weight, changes in blood chemistry, liver and kidney toxicity, and reproductive and developmental toxicity."** EPA also states that studies show that the likelihood of spills increase as the volume of wastewater and number of trips increase. **It is highly likely that at least some of these chemicals will leak, spill, or migrate into water supplies. Therefore, allowing drilling and fracking activities in the Delaware River Basin amounts to a huge gamble with people's health.**

7. Bromide is a contaminant consistently found in frack wastewater. Pennsylvania Department of Environmental Protection acknowledges that bromide is a key parameter of concern in the effluent because it can form brominated disinfection by-products (DBP's) in water supplies. **These are a drinking water hazard because of the propensity for the brominated DBP's to form trihalomethanes and haloacetic acid, which can cause cancer.**

8. According to a report that examined the potential impacts from fracking on the Delaware River Watershed (Habicht, 2015) **the development of shale gas wells could as much as double nitrogen oxides (NOx) emissions**, compared to current air conditions in the Marcellus Shale counties of the basin, and it will be released on a long-term basis from the compressor stations that are required to move gas through gathering lines to market pipelines. The release of the NOx is unavoidable throughout the life of the producing gas well. **NOx and VOCs are precursors to ozone, or smog, which is known to cause respiratory illness. Other air pollutants are released by fracking and during all stages of gas development, including sulfur oxides, particulate matter, and volatile organic compounds such as formaldehyde, benzene, toluene, ethylbenzene, and xylene. This would have a direct negative impact on human health and the ambient air quality of the region.**

9. In the same study that examined the potential impacts from fracking on the Delaware River Watershed, health impacts from air emissions and other pollution from fracking was examined. The report mapped the likely location of well pads in the Delaware River Watershed's Marcellus Shale region and estimated that 45,000 people live within 1 mile of a projected well pad, virtually the entire population of the location where fracking is most likely to occur. The study reported that scientific literature documents that some health risk factors are related to the distance from a well pad to a person's home. 60% of the health of Wayne County's population could be affected by close proximity to a well pad. The study examined the pollutants that people would be exposed to, based on scientific studies (CNA, Table 12). **These**

findings make very clear that the effects of gas development and fracking on the air and the health of the people of the region are inescapable due to the proximity of projected well pad locations to the population. It is unacceptable to sacrifice the air quality and health of the people of the Marcellus Shale region in the Delaware River Basin so that shale gas can be developed. The only protective option is to prohibit fracking and gas development completely.

10. In an analysis of hospitalizations in Pennsylvania comparing areas with fracking and an area without fracking (Jemielita, 2015) it was found that increased inpatient prevalence rates occurred where unconventional gas wells (employing fracking) were located. Cardiology patients were significantly associated with the number of wells and inpatient prevalence rates also correlated with neonatology, neurology, dermatology, urology, and oncology. Neurology inpatient prevalence rates were significantly associated with wells per kilometer. **The researchers estimated that larger numbers of active hydraulic fracturing wells would increase inpatient prevalence rates over time, making it clear that fracked gas wells do effect hospitalizations, and thereby human health. This is just one study of hundreds that have found adverse health effects in fracked communities; see the Compendium for more.**

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