# **Fracking Waste in Connecticut**

Protecting Towns from Future State Regulations & Loopholes Toxins & Risks of Radioactive & Chemical Contamination

Jen Siskind Local Coordinator, Food & Water Watch

This presentation, or follow-up Q&A, is available free for municipalities, state legislators, community groups & faith communities by contacting: jsiskind@fwwlocal.org





Base map courtesy FracTracker www.fractracker.org





Vertical Wells and Horizontal Wells

National Council on Radiation Protection E. Ivan White, Senior Staff Scientist Consideration of Radiation of Hazardous Waste Produced from Horizontal Hydrofracking





**Figure 2: Pathways for Radiation Migration Through Air** 



Figure 3: Pathways for Radiation Migration Through Soil and Water

National Council on Radiation Protection, Dr. E. Ivan White, Senior Staff Scientist, Consideration of Radiation of Hazardous Waste Produced from Horizontal Hydrofracking



Causes Breast<br/>Bone and<br/>Liver CancersFigure 4.Measured activities for total radium (Ra-226 + Ra-228) and Ra-226 for each of the data sources used in<br/>the study. The three datasets for produced water from Marcellus Shale wells are shown on the left; the remaining<br/>three datasets are for non-Marcellus Shale wells. The number of points in each dataset is shown in parentheses,<br/>and the median values are plotted as heavy black lines. For reference, the dashed line shows the industrial effluent<br/>discharge limit (60 pCi/L) for Ra-226 (U.S. Nuclear Regulatory Commission, http://www.nrc.gov/reading-rm/<br/>doc-collections/cfr/part020/appb/Radium-226.html).

#### Adult and Childhood Leukemias

US Geological Survey (USGS) Radium Content of Oil- and Gas-Field Produced Waters in the Northern Appalachian Basin (USA): Summary and Discussion of Data By E.L. Rowan, 1 M.A. Engle, 1 C.S. Kirby, 2 and T.F. Kraemer1

Health	Effects	of Naturally	v-occurring 7	Toxins
neutri	LIICCUS	ornaturan		

Radium226 & 228 Causes breast, bone & liver cancers, Associated with leukemia Radioactive half-life of 1,600 years Decays into other radioactive material & lead Associated with bladder, kidney & skin cancers Arsenic Children - Brain & nervous system damage, developmental delay Lead - High blood pressure & kidney damage Adults Barium Abnormal heart rhythms Strontium Children - Impacts bone growth Benzene Causes Leukemia Toluene Nervous system, liver & kidney damage Memory, stomach upset, liver & kidney changes, impacts to fetus Xylene Chromium 6 Dermal burns, vertigo, GI hemorrhage, liver & kidney damage, cancer PAHs Associated with skin, lung, bladder & gastrointestinal cancers **Bromides** React synergistically with chlorine added to disinfect drinking water creating brominated trihalomethane - highly carcinogenic



649 Known chemicals in 2011

56% Examined & reported here-363\*44% No information available on these chemicals

**Soluble** in water = Run-off & leaching Impact drinking water supplies Impact soil, property & surface waters

Volatile = Vaporize Travel through air - Inhaled Settle on surfaces, water & crops - Absorbed by skin

- Ingested

Colborn, et al 2011 Physicians for Social Responsibility-LA www.PSA-LA.org





### Yale school of public health

- 119 Carcinogens, known & suspected, can travel through air & water
- Toxins liked to developmental & reproductive health problems
- 1,157 known chemical additives



COLORADO STATE UNIVERSITY

### DARTMOU

High levels of radioactivity, chlorides, carcinogens & endrocrine distrupters 12 miles from treatment facilities.

## Duke NICHOLAS SCHOOL OF THE



- Radioactive sediment in waterways in PA & ND Spills and post-treatment discharge causing contamination
- Iodide, Bromide + Chlorine = Carcinogenic Trihalomethane
- 6,648 spills in 4 states over 10 years 50% storing & moving waste

**Concerned Health Professionals of NY** concernedhealthny.org/compendium/ 1,200+ Studies Compendium 2018 5<sup>th</sup> Ed



**Elevated Levels of Diesel-like Chemicals Found in 65 Home Wells** Tied to surface spills Trace amounts found 3-5 years later



Study: Fracking associated with migraines, fatigue, chronic nasal and sinus symptoms

### Johns Hopkins study links fracking to premature births, high-risk pregnancies

Researchers look at nearly 11,000 births in north, central Pennsylvania

### colorado school of public health

Age 5-24 Leukemia 4.3 x likely live near dense drilling activity COLUMBIA UNIVERSITY

### 🕱 Penn Medicine

**Increased Hospitalizations in Heavily-drilled PA Counties:** Cardiology Neurology Dermatology Neonatology Urology Oncology



### Stanford SCHOOL OF EARTH, ENERGY

& ENVIRONMENTAL SCIENCES

PA treatment inadequate. Increased chloride, bromide, strontium, radium.

Despite removing >90% of radium, sediments downstream of discharge ~ 200x greater than upstream levels.



22 Bq/kg vs 544 Bq/kg

PennState PennState

Brine used for road spreading in 14 PA townships tested. Road spreading causing lead & radium contamination on roads, radium & salt run-off.

## 

After industrial facility treatment, conventional oil & gas well waste discharge causes radium build-up in 3 PA waterways, up to 650x background levels.



Waste water spills affect water quality in streams in WV. 112 private wells tested with no current detectable impact.

Concerned Health Professionals of NY <u>concernedhealthny.org/compendium/</u> 1,200+ Studies Compendium 2018 5<sup>th</sup> Ed



## Radium found in commercial roadway deicing, dust suppression brine



f

9

6

#### DON HOPEY 🗹

Pittsburgh Post-Gazette dhopey@post-gazette.com 🎐 JUL 2, 2018 7:00 AM

An Ohio environmental organization is suing to learn more about unhealthy radiation levels in a commercial de-icing and dust suppression liquid made from gas well brine sold in several states, including Pennsylvania.

The Buckeye Environmental Network filed suit against the Ohio Department of Natural Resources last week, claiming the agency has illegally denied its request to inspect public records and documents pertaining to the environmental and health impacts of the brine product AquaSalina, manufactured by Brecksville, Ohio-based Nature's Own Source.

According to a July 2017 ODNR report that was released early this year after the network filed a right-to-know request, the department found samples of AquaSalina that contained concentrations of radium, a known carcinogen, that are higher than those naturally occurring in brine produced from "conventional," that is non-shale, gas wells.



### Sustice Toxics Climate Water Energy Food Population Pittsburgh 🗧



May 30, 2018

### Radium has been widely spread on Pennsylvania roadways without regulation: Study

200 times more of the carcinogen has been released into the environment through legal road brining than has as a result of oil and gas industry spills.





	HOME	RESEARCH	ACADEMICS	IMPACT	CAMPUS LIFE	ATHLETICS	ADMINISTRATION	ARTS AND ENTERTAINMENT
--	------	----------	-----------	--------	-------------	-----------	----------------	------------------------

### Fracking wastewater accumulation found in freshwater mussels' shells

### 1 23K 💙 🖸 🕤 1 94



The Elliptio complanate freshwater mussel, one of the two species used in the experiment. IMAGE: WESTCOTT PHILLIP / WIKIPEDIA COMMONS



Drilling Process = Drill Cuttings & drilling muds Chemicals + naturally-occurring toxins

THE T

Hydraulic Fracturing Process = Flowback Waste = Fracking fluids + silica sand + drill cuttings + brine + sludge Chemicals +naturally-occurring toxins





"Fresh Water" (Industry term) Partially treated & re-used many times Finally too contaminated to use & needs disposal Chemicals + naturally-occurring toxins





### Potential Chain of Radioactive & Chemical Contamination in CT

Transport*	Accidents, leaks, spills Run-off, leaching into soil, ground & surface Water		
Transfer & Storage*	Accidents, leaks, spills Run-off, leaching into soil, ground & surface water		
POTW/Haz Mat Facility*	Concentrated residuals transferred out of state Effluent Discharged to local waterway or sewage system Effluent to POTW or City Waste Water Facilities		
Effluent to POTW*	Effluent discharged to waterways Sludge to incinerators		
Trash to Energy Incinerator	Incinerator emissions Disposal of incinerator ash		
Beneficial Use (BUD) Permits** (Wastes re-used for other purposes)	Run-off, leaching into soil & surface v Solids Construction fill Road base Brownfield cap De-watered salts Concrete aggregate	water Liquid Sprayed on roads De-icer Dust control	

- \* Contamination & remediation costs in other states with regulations
- \*\* PADEP reversed policy for solid waste BUD permits 5 years after permitting citing, "lack of transparency". FOIL requests for liquid wastes in NY found extremely high chloride levels, presence of benzene & toluene, and no records requiring testing for radioactivity.



	Types of Oil & Gas Drilling & Extraction Wastes	56 of 58 CT Local Bans	2014 Temp Moratorium	2017 HB 6329 Ban not passed	2018 SB 103 Ban not passed
Gas	Drilling Process Drilling Muds	X			×
Gas	Drilling Process Drill Cuttings	X			×
Gas	Leachate from Solid Wastes & Landfills	X			×
Gas	Hydraulic Fracturing Flowback	X	Х	X	×
Gas	Used Frac Sand from Flowback	X	X	×	×
Gas	Production Process Brine	X	?	?	×
Gas	Dehydration Process Brine	X	?	?	×
Gas	Chemicals Used on Pad Surface	X	?	?	×
Gas	Servicing Fluids for Equipment	X	?	?	×
Gas	Underground Storage Waste	X			×
Gas	LPG Well Storage Waste	X			×
Oil	Drilling Process Drilling Muds	X			×
Oil	Drilling Process Drill Cuttings	X			×
Oil	Leachate from Solid Wastes & Landfills	X			×
Oil	Hydraulic Fracturing Flowback*	X			×
Oil	Used Frac Sand from Flowback	X			×
Oil	Production Process Brine	X			×
Oil	Chemicals Used on Pad Surface	X			×
Oil	Servicing Fluids for Equipment	X			×







### Banning Fracking Waste in Connecticut, Town by Town



For more information, questions or to arrange an in-person, free presentation, please contact: Jen Siskind, Local Coordinator jsiskind@fwwlocal.org

