

Donna Yavorsky

Hydraulic Fracturing (Fracking) Harms

◆ There is significant evidence that natural gas development, and its related operations, which include all the phases of the hydraulic fracturing ("fracking") process, from the first stage of industrial land preparation; to the storage, handling, and use of chemicals and additives for extraction and stimulation; to drilling and fracking; to the withdrawal of and degradation of large volumes of water and its discharge and disposal as waste, has substantial adverse effects on public health, property interests, agriculture, and on our air, water, and land.⁴

◆ The most recent statistical analysis of the body of scientific literature by the Concerned Health Professionals of New York and Physicians for Social Responsibility, 685 peer-reviewed papers examining gas drilling and/or hydraulic fracturing ("fracking") were reviewed and the overwhelming majority of studies found evidence of or potential adverse impacts on water, air, and human health.⁵

◆ Pennsylvania Department of Environmental Protection (PADEP) has determined that there are 301 cases of private water well contamination caused by oil and gas operations in the Commonwealth⁶; over 4,400 water complaints related to oil and gas have been filed by the public with PADEP. Between 2004 and 11.2016, PADEP lists 9,443 public complaints about environmental problems in shale gas drilling areas.⁷

<http://mgaleg.maryland.gov/webmga/frmMain.aspx?pid=narrowsubpage&tab=subject3&id=hydrfrac&stab=01&ys=2017rs>

3

NRDC Policy Basics, 2013. Available at: <http://bit.ly/2yPF7Re>

4

PSE Healthy Energy Library, https://www.zotero.org/groups/pse_study_citation_database/items; See Compendium, <http://concernedhealthny.org/compendium/>, p. 4; Environmental Protection Agency (EPA). 2015. U.S. EPA. Hydraulic Fracturing for Oil and Gas: Impacts from the Hydraulic Fracturing Water Cycle on Drinking Water Resources in the United States (Final Report). U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-16/236F, 2016. Available at: www.epa.gov/hfstudy and <https://cfpub.epa.gov/ncea/hfstudy/recordisplay.cfm?deid=332990>; PADEP, accessed 10.25.2017 at: http://files.dep.state.pa.us/OilGas/BOGM/BOGMPortalFiles/OilGasReports/Determination_Letters/Regional_Determination_Letters.pdf

5

PSE Healthy Energy Library, https://www.zotero.org/groups/pse_study_citation_database/items; See Compendium, <http://concernedhealthny.org/compendium/>, p. 4

Delaware Riverkeeper Network, "Unsafe and Unsustainable," http://www.delawariverkeeper.org/Documents/DRN_Report_Unsafe_Unsustainable_fr.pdf

6

http://files.dep.state.pa.us/OilGas/BOGM/BOGMPortalFiles/OilGasReports/Determination_Letters/Regional_Determination_Letters.pdf

7

<https://stateimpact.npr.org/pennsylvania/2017/01/31/data-trove-offers-new-details-on-complaints-to-depduring-shale-boom/> and https://docs.google.com/spreadsheets/d/1_tg1zTCA-

EPA's most recently released fracking study provides scientific evidence that fracking activities can impact drinking water resources and includes water impacts from shale gas in the Pennsylvania community of Dimock.

8

◆ Fracking pollutes groundwater, destroying the quality of aquifers for generations to come. The chemicals in fracking fluids will migrate to drinking water aquifers and to the surface it is not a question of "if", but "when".⁹ Considering groundwater flow, time, and the corrosive downhole environment created by gas extraction processes, including the lack of durability of the cement sealant and steel well casings, aquifers and surface waters are not sufficiently isolated from the toxic fluids and deep geology pollutants that are distributed by drilling and fracking.¹⁰

Aquifers could be

impacted quickly, such as when there is a faulty cement seal or casing during construction, or over time. But it is certain that the life of the cement and/or steel (usually 80 to 100 years or less) is less than the life of the aquifer - so even if there is no evidence in the near term, the eventual pollution likely occur in less than a century¹¹

- ruining water sources for the generations that will follow. The potential for

fracking fluids to move from the production zone of a gas well to water resources "cannot be engineered out of the process (Gassiat et al. 2013). In other words, the process of injecting fluids into and fracturing the shale causes the potential pollution problem."¹² Contaminated fluids from the fracking process can move from the deep shale to water resources through various pathways including fractures and natural vertical flow, in thousands of years or in less than ten years, polluting groundwater.¹³

- ◆ Natural gas is primarily methane, a greenhouse gas 86 times more efficient at warming the atmosphere than carbon over a 20 year time frame¹⁴ and its effects persist for hundreds of years¹⁵. The well documented vented and fugitive losses from natural gas systems contribute to atmospheric warming; current technology and practices have not controlled these releases. The emissions from shale gas development are so great that it is projected that their release from the build out of

xTmFk4erdcYJt4zqmQZ9x89qliQg55zekg/edit#gid=1060152199 and
<https://maps.fractracker.org/latest/?appid=f973714e27c14e1ebee222d2560f8cb0>

8

Environmental Protection Agency (EPA). Assessment of the Potential Impacts of Hydraulic Fracturing for Oil and Gas on Drinking Water Resources External Review Draft. June 2015. Available at: www.epa.gov/hfstudy; Hein 2012, p. 2. <https://cfpub.epa.gov/ncea/hfstudy/recordisplay.cfm?deid=332990>

9

Rubin, Paul, 2014. "Unsafe and Unsustainable", Delaware Riverkeeper Network, p. 36, 38 and 39.

10 Rubin, Paul, 2014. "Unsafe and Unsustainable", Delaware Riverkeeper Network, p. 27.

11 Rubin, Paul, 2014. "Unsafe and Unsustainable", Delaware Riverkeeper Network, p. 36, 38 and 39.

12 Myers, T., 2014. "Unsafe and Unsustainable", Delaware Riverkeeper Network, p. 56.

13 Myers, T., 2012. Potential contaminant pathways from hydraulically fractured shale to aquifers. *Ground Water* 50(6): 872-882 doi: 10.1111/j.1745-6584.2012.00933.x

14 Intergovernmental Panel on Climate Change (IPCC). 2013. *Climate Change 2013: The Physical Science Basis*.

Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.

15

<http://www.pnas.org/content/early/2017/01/03/1612066114.full> Pennsylvania's Marcellus shale will prevent the achievement of global warming

goals in the state, accelerating climate change.¹⁶ Climate change impacts on the basin's water resources include changes in precipitation and runoff that increase flooding and drought, impairment of habitats and water quality (including salt water intrusion to Delaware Estuary water supplies) and sea level rise¹⁷

- ◆ Changes to stream water quality occur where gas drilling and related activities are located. For instance, a publication of the Proceedings of the National Academy of Sciences found streams adjacent to gas wells are negatively impacted by runoff and sedimentation (Total Suspended Solids), harming benthic life, fish and wildlife and causing streams to be eroded and destabilized.¹⁸

- ◆ Substantial damage is caused by the toxic wastewater produced by fracking which contains many dangerous pollutants, including naturally occurring radioactive materials, that cannot be fully removed by treatment and those damages can substantially harm the water quality of our streams and the life in them. Pollutants will inevitably spread downstream to negatively impact all of the watershed states, the habitats, fish, wildlife, and recreational values of the river and our vulnerable drinking water supplies.

- ◆ Fracking uses proppants such as silica sand that is mined in the Midwest, states such as Wisconsin, Minnesota, and Iowa, to prop open the fractures in the rock caused by the fracking process. The sand mining activities are having devastating impacts in the sand regions and pose serious health impacts for workers.¹⁹ The sand is primarily transported by rail, often on heavy, mile-long trains, and then offloaded onto trucks to be carried into the well site.