

# Shale Gas Exploration and Production:

## POTENTIAL HEALTH IMPACTS

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September 2013

## Shale gas extraction and production using HVSWHLHF:

- Determinants of health—social and environmental stressors on health from gas drilling
- Lessons learned from the US
- Public health concerns, Health Impact Assessment and the New York medical community's advocacy

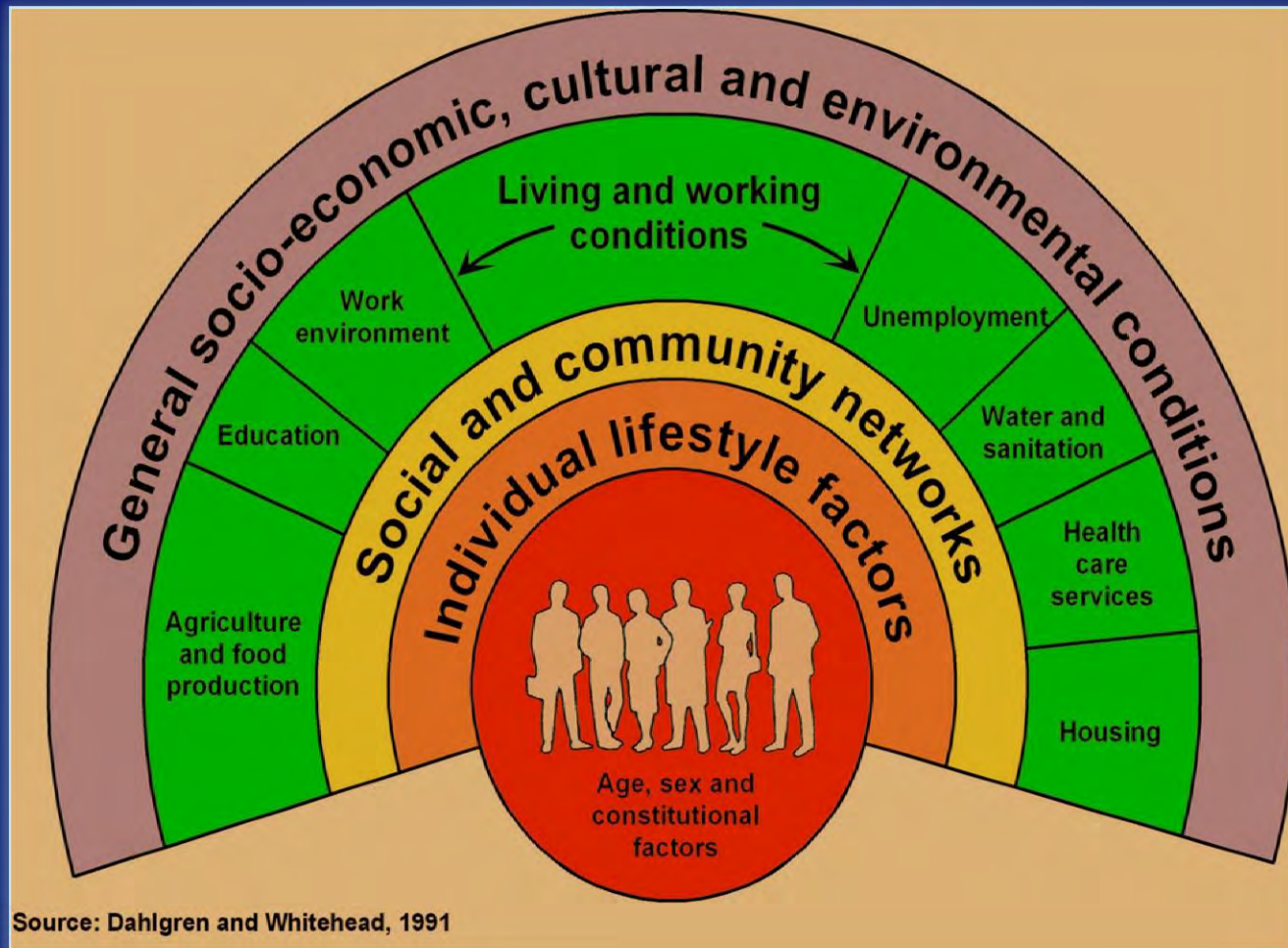
# Who might be impacted?

## People...

- ~ in areas mining silica
- ~ where gas drilling and fracking occur
- ~ near pipelines, power plants and storage facilities
- ~ who receive their water from gas drilling areas
- ~ who are downwind of gas producing or processing areas
- ~ whose regions receive gas drilling waste
- ~ Marcellus shale gas consumers
- ~ who are workers in the gas industry
- ~ whose health is already compromised, or who are vulnerable

...as well as animals, water , air and crops

# DETERMINANTS OF HEALTH



# IMPACTS THAT MAY BE ASSOCIATED WITH HEALTH EFFECTS ENVIRONMENTAL STRESSORS

- AIR POLLUTION
- WATER CONTAMINATION
- CHEMICAL MIX
- RADIATION
- WASTE

# IMPACTS THAT MAY BE ASSOCIATED WITH HEALTH EFFECTS ENVIRONMENTAL STRESSORS AIR POLLUTION

- Witter R, et al, Battlement Mesa HIA 2011 <http://www.garfield-county.com/environmental-health/battlement-mesa-health-impact-assessment-draft2.aspx>
- McKenzie LM, et al, Human Health Risk Assessment of Air Emissions from Development of Unconventional Natural Gas Resources 2012 <http://www.ncbi.nlm.nih.gov/pubmed/22444058>
- Colborn T, et al, An Exploratory Study of Air Quality near Natural Gas Operations 2012 <http://www.endocrinedisruption.com/chemicals.air.php>
- NOAA ozone study <http://www.eenews.net/public/Landletter/2011/04/21/1>





# SOURCES OF AIR POLLUTANTS

- Natural gas
  - CH<sub>4</sub> (potent GHG precursor)
  - BTEX – Benzene, toluene, ethylbenzene, and xylene
  - H<sub>2</sub>S
- wells, compressor stations, storage tanks, pumps, pipes, processing plants, power plants, trucks
- Particulate matter
- Flaring
- VOCs
- Radon



[http://www.edf.org/sites/default/files/9235\\_Barnett\\_Shale\\_Report.pdf](http://www.edf.org/sites/default/files/9235_Barnett_Shale_Report.pdf)  
<http://www.epa.gov/airquality/oilandgas/pdfs/20120417presentation.pdf>

The yellow flag at the drill site announces that poisonous H<sub>2</sub>S gas may be present.

<http://www.businessinsider.com/youve-never-seen-anything-like-the-williston-oil-boom-2012-3?op=1#ixzz2bj922pEn>

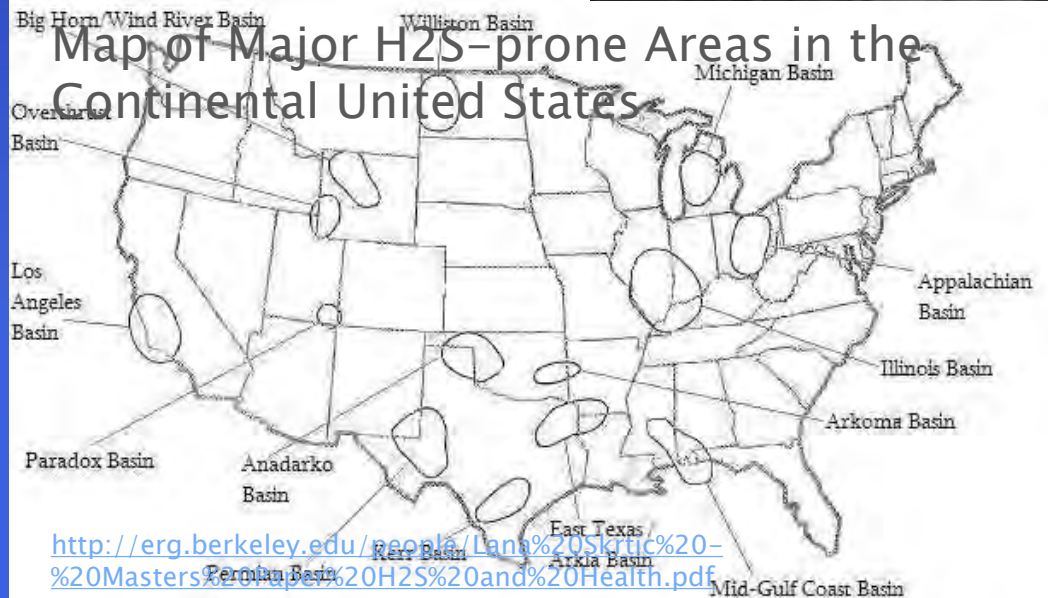


Air emissions as seen with infrared cameras



Sulfur removal in a gas treatment plant

<http://www.naturalgas.org/naturalgas/processing/ng.asp>



Map of Major H<sub>2</sub>S-prone Areas in the Continental United States

<http://erg.berkeley.edu/people/Lana%20skrtic%20-%20Masters%20paper%20H2S%20and%20Health.pdf>



# IMPACTS THAT MAY BE ASSOCIATED WITH HEALTH EFFECTS ENVIRONMENTAL STRESSORS

## WATER CONTAMINATION

- Methane migration—2011 Duke study  
<http://www.biology.duke.edu/jackson/pnas2011.html>
- Brine migration--2012 Duke and CalStatePolytech  
<http://www.pnas.org/content/early/2012/07/03/1121181109.full.pdf>
- Increased stray gas abundance in water wells near Marcellus shale gas wells—2013 Duke, U of Rochester, CalStatePolytech and Max Planck Institute  
<http://www.pnas.org/content/110/28/11250.full.pdf>
- Increased total dissolved solids and heavy metals in groundwater near Texas gas drilling sites--2013 Univ of Texas  
<http://pubs.acs.org/doi/pdf/10.1021/es4011724>
- Bamberger and Oswald—2012 New Solutions  
[http://www.psehealthyenergy.org/Impacts\\_of\\_Gas\\_Drilling\\_on\\_Human\\_and\\_Animal\\_Health](http://www.psehealthyenergy.org/Impacts_of_Gas_Drilling_on_Human_and_Animal_Health)
- Amy Mall—NRDC 2011-12  
[http://switchboard.nrdc.org/blogs/asmall/incidents\\_where\\_hydraulic\\_frac.html](http://switchboard.nrdc.org/blogs/asmall/incidents_where_hydraulic_frac.html)



Photo <http://english-work123.blogspot.com/2010/09/water-pollution.html>

Yet, when the evidence points to contamination, EPA retreats under industry and political pressure <http://www.propublica.org/article/epas-abandoned-wyoming-fracking-study-one-retreat-of-many>

# GAS AND FLUID MOVEMENT PATHWAYS

## How Gas Drilling Could Spoil Your Drinking Water

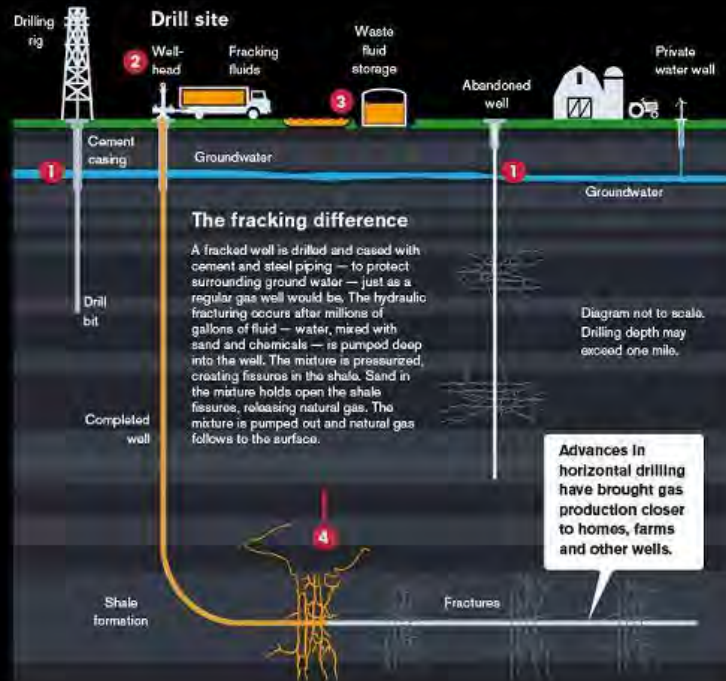
The EPA has undertaken a three-year study of the impacts of hydraulic fracturing or "fracking" on drinking water amid complaints of water contamination. While some industry leaders insist there has never been a case of tainted water due to fracking, several states have begun requiring companies to monitor groundwater quality near their gas and oil wells.

GRAPHIC: DAVE MERRILL / BLOOMBERG VISUAL DATA

### Contamination scenarios

Poor drilling practices, faulty wells, and mishaps can release methane or drilling fluids into the water cycle.

- 1 Bad cement jobs:** State regulations require drillers to extend protective cement casing from the well's surface to below the deepest groundwater. Cracked or incomplete casing can lead to gas or chemicals escaping into ground water. Cracked seals in abandoned wells, which are typically plugged with cement, are often cited as sources of leaking methane.
- 2 Accidents:** Hydraulic fracturing chemicals can spill onto well pads during equipment ruptures or blowouts.
- 3 Storage tanks leaks:** Flowback water is stored in watertight tanks in some states and in open pits in others. Evaporating fluids and spills can introduce chemicals into the water cycle.
- 4 Upward migration:** EPA analysis of polluted groundwater in Pavillion, Wyoming, suggested that the source of contamination was the hydraulic fracturing zone rather than surface storage pits.



Sources: EPA, Bloomberg research

Bloomberg Visual Data

<http://www.damascuscitizensforsustainability.org/gas-drilling-can-spoil-your-water/>

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# IMPACTS THAT MAY BE ASSOCIATED WITH HEALTH EFFECTS ENVIRONMENTAL STRESSORS CHEMICAL MIX

~is considered **proprietary**

~includes known or **suspected carcinogens, mutagens, endocrine disruptors, neurotoxins, hazardous air pollutants**

~many of the chemicals in these products have **effects at low doses**, and children and pregnant women should not be exposed to some at all.



# SOME OF THE CHEMICALS USED IN GAS DRILLING AND HYDRAULIC FRACTURING THAT ARE TOXIC TO HUMAN HEALTH

- Benzene (known carcinogen)
- Ethylbenzene
- Toluene (causes miscarriages, placenta previa)
- Xylene
- Diesel (recently classified by WHO as a carcinogen)
- Naphthalene (neurotoxin; carcinogen)
- Polynuclear aromatic hydrocarbons (PAHS) (carcinogens)
- Formaldehyde (known carcinogen)
- 2-Butoxyethanol (2BE) (known carcinogen); active component of Corexit which was used as a dispersant in the Exxon Valdez and BP Gulf disasters

<http://www.atsdr.cdc.gov/ToxProfiles/tp118-c2.pdf>

Dr Theo Colborn at the Endocrine Disruption Exchange --paper on the chemicals associated with gas drilling operations.

<http://www.endocrinedisruption.com/files/GasManuscriptPreprintforweb12-5-11.pdf>



# IMPACTS THAT MAY BE ASSOCIATED WITH HEALTH EFFECTS ENVIRONMENTAL STRESSORS

## WASTE

- **hazardous with current disposal methods**  
[http://www.shalegas.energy.gov/resources/060211\\_earthworks\\_petroleumexemptions.pdf](http://www.shalegas.energy.gov/resources/060211_earthworks_petroleumexemptions.pdf) and <http://www.dcbureau.org/201308148881/natural-resources-news-service/new-york-imports-pennsylvanias-radioactive-fracking-waste-despite-falsified-water-tests.html#more-8881>
- **waste contains radioactive elements, brine and gases**  
<http://www.grassrootsinfo.org/pdf/radioactivewaste.pdf> and <http://www.grassrootsinfo.org/pdf/whitereport.pdf>
- **exempt from federal oversight** <http://www.epa.gov/osw/nonhaz/industrial/special/oil/oil-gas.pdf>

- **disposal in underground injection wells can, and has caused earthquakes**

*Katie*

*M. Keranen, Heather M. Savage, and Geoffrey A. Abers et al., "Potentially Induced Earthquakes in Oklahoma, USA: Links between Wastewater Injection and the 2011 Mw 5.7 Earthquake Sequence," Geology, vol. 41, no. 3 (March 26, 2013)*  
<http://geology.gsapubs.org/content/early/2013/03/26/G34045.1.abstract> <http://www.ldeo.columbia.edu/news-events/wastewater-injection-spurred-biggest-earthquake-yet-says-study>  
<http://stateimpact.npr.org/texas/tag/earthquake/>



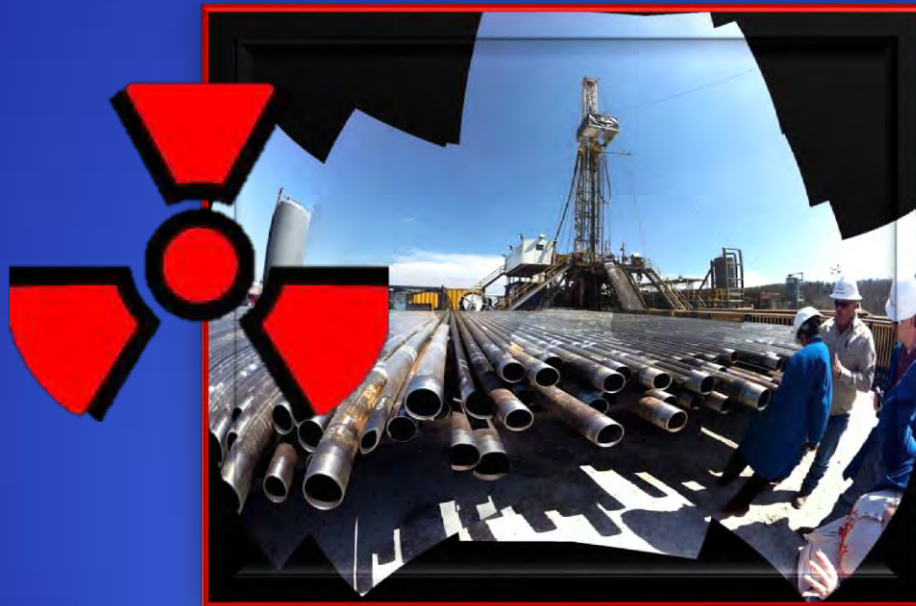
<http://www.michiganradio.org/post/questions-linger-after-company-spreads-toxic-chemicals-northern-michigan-roads>

# IMPACTS THAT MAY BE ASSOCIATED WITH HEALTH EFFECTS

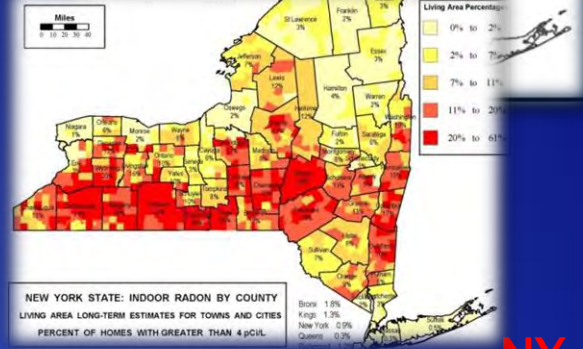
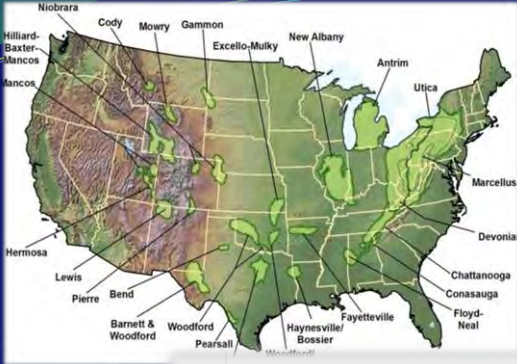
## ENVIRONMENTAL STRESSORS

### RADIATION

- recommendations from the International Atomic Energy Agency (IAEA)  
[http://www-pub.iaea.org/MTCD/publications/PDF/TCS-40\\_web.pdf](http://www-pub.iaea.org/MTCD/publications/PDF/TCS-40_web.pdf)
- federal exemption <http://www.epa.gov/osw/nonhaz/industrial/special/oil/oil-gas.pdf>
- radon and gas extraction <http://www.youtube.com/playlist?list=PL5ZlvUpU2rIFyef942AHLVpq-w5YMfda>



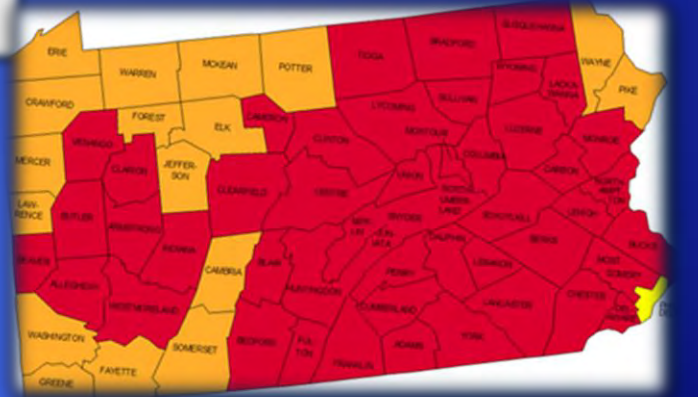
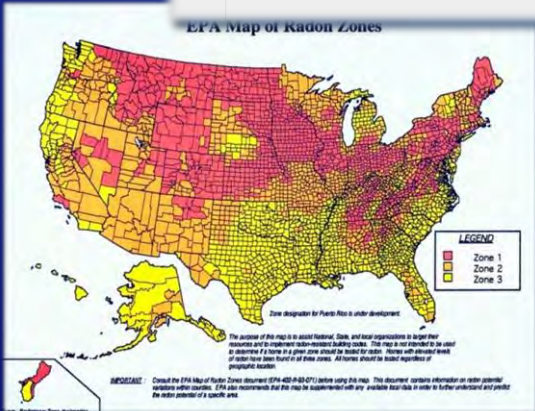
# RADON



**Zone 1** counties have a predicted average indoor radon screening level greater than 4 pCi/L (picocuries per liter) (red zones) **Highest Potential**

**Zone 2** counties have a predicted average indoor radon screening level between 2 and 4 pCi/L (orange zones) **Moderate Potential**

**Zone 3** counties have a predicted average indoor radon screening level less than 2 pCi/L (yellow zones) **Low potential**



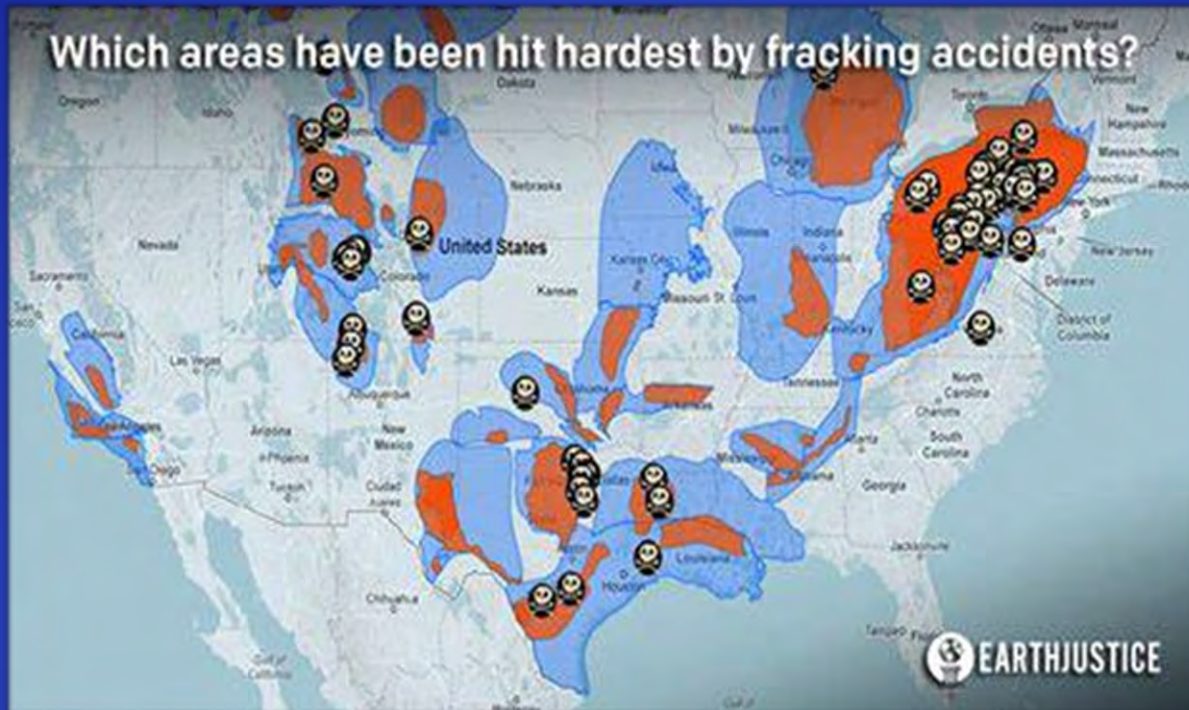
NY

PA



# ACCIDENTS AND EXPLOSIONS

can occur at any point of gas development, from transport of equipment and chemicals to the site, to construction and operation of the well, to the processing of the gas and to the delivery of it via pipelines, and at any of those points, accidents and explosions are possible



<http://earthjustice.org/features/campaigns/fracking-across-the-united-states>



LOSS OF VIEWSHED, FOODSHED AND  
WATERSHED; SURFACE DISTURBANCE FOR  
ONE WELL PAD IS 3-5 ACRES



# IMPACTS THAT MAY BE ASSOCIATED WITH HEALTH EFFECTS COMMUNITY STRESSORS

- road safety and traffic patterns
- worker safety
- social concerns such as housing, community character, schools, substance abuse
- justice concerns such as vulnerable populations, equality
- economic issues such as employment, value of home, cost of healthcare
- health infrastructure including availability, insurance, cost
- community social structure
- cumulative effects of multiple stressors

# OSHA DATA ON WORKERS IN THE GAS INDUSTRY



(Photo credit: Ed Wade/Weizel County Action Group)

CDC: "Transportation accidents are the leading cause of occupational fatalities in the mining industry. The younger the worker is, the greater the likelihood of the worker becoming a victim of these types of fatalities..."

"During 2003–2008, 648 oil and gas workers were fatally injured on the job, resulting in an occupational fatality rate eight times higher than the rate for all U.S. workers. Nearly half of all fatal events in the oil and gas extraction industry resulted from highway crashes (29%) and workers struck by objects and equipment (20%)..."

<http://www.cdc.gov/niosh/docket/review/docket213/pdfs/OilGasExtractionDraftAug2010.pdf> and <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5716a3.htm>

**TABLE 2. Number of fatal injuries among oil and gas extraction workers, by type of injury event — United States, 2003–2006\***

Injury event	No. of fatal Injuries
Highway crash	110
Struck by object	88
Explosion	36
Fall to lower level	30
Fire	27
Caught or compressed in moving machinery or tools	26
Electric current	20
Aircraft crash	18
Other	49
<b>Total</b>	<b>404</b>

**SOURCE:** US Department of Labor, Bureau of Labor Statistics, Census of Fatal Occupational Injuries (2003–2006).

\* Data for 2006 are preliminary.



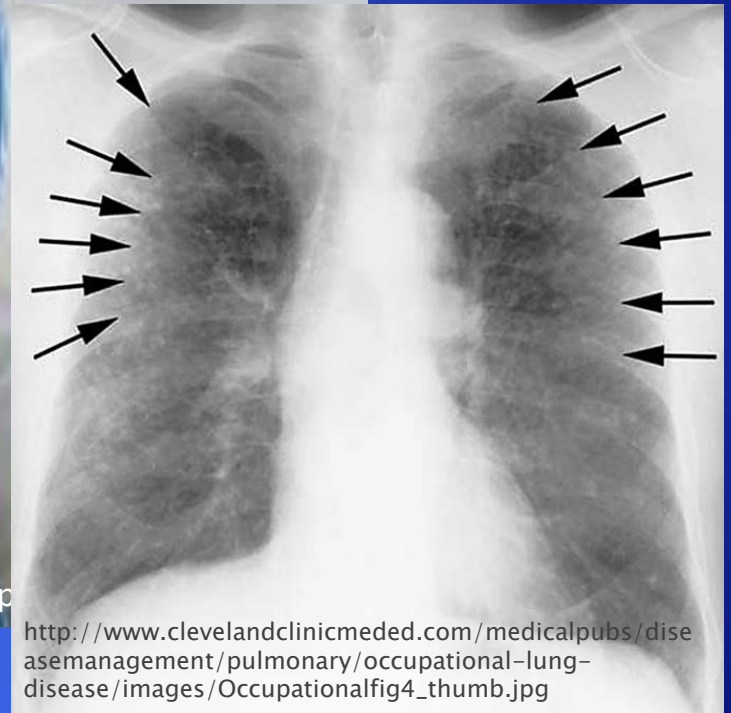
# SILICA MINING



<http://www.iatp.org/documents/the-economic-benefits-and-costs-of-frac-sand-mining-in-west-central-wisconsin>



# SILICOSIS



## PUBLIC HEALTH CONCERNS...

- There are documented instances of illness in drilling areas, but are they due to gas drilling?
- Medical practitioners are not trained to recognize environmental illness
- Monitoring and health data collection is not occurring routinely
- Research is still scant
- There are documented instances of water and air contamination; due to gas drilling?
- Pathways of exposure have not been identified
- Non-disclosure agreements hamper access to health information
- On the national level, the oil and gas industry is exempt from key provisions of major federal public health laws.

# US FEDERAL EXEMPTIONS

The oil and gas industry was granted exemptions from key provisions in the major federal statutes intended to protect human health and the environment. These statutes include:

- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA )
- Resource Conservation and Recovery Act
- Safe Drinking Water Act
- Clean Water Act
- Clean Air Act
- National Environmental Policy Act
- Toxic Release Inventory under the Emergency Planning and Community Right-to-Know Act
- Superfund Act

<http://www.earthworksaction.org/pubs/PetroleumExemptions1c.pdf>

There is no public health agency in the United States that is routinely seeking and compiling information about people who have been adversely impacted by shale gas development...not on the local, or county, or state, or federal level.

The image shows a screenshot of a website for a survey titled "Natural Gas Exploration and Production Health & Community Impacts Survey". The website header includes the logo for "DCS DAMASCUS CITIZENS FOR SUSTAINABILITY" with the tagline "CLEAN WATER, AIR AND LAND ARE BASIC HUMAN RIGHTS". The main heading of the survey is "Natural Gas Exploration and Production Health & Community Impacts Survey". Below the heading, there are four navigation tabs: "Survey Information", "Letter of Invitation from the Damascus Citizens for Sustainability", "Survey Questions", and "Survey Instructions". The main content area contains the following text:

**Are you, your family, your neighbors and community living near Natural Gas Drilling, Exploration & Production sites and activities?**

Are you concerned about the impacts of Natural Gas drilling and production on your family? On your water? Your food? Your health and well-being? Have you noticed changes in the water, land around you?

Do you have information about the impacts of gas drilling in your area? Are you aware of other organizations working together to design a shared health impact study? And if not, would you like to?

**Now we're launching the Survey!**

- The local environmental attorney teamed with the Agency for Toxic Substances and Disease Registry, a division of the CDC (Center for Disease Control) in the Department of Health & Human Services.
- Position to set a Public Health Assessment in your area.
- This survey has been created to help you and your community, and change public policy. Your information will go towards creating a national database and a national review of energy (EOLSR) impacts.

**So please, take the Natural Gas, Health and Community Impacts Survey.**

See more at the Survey Information Menu and in the right column.

**Not sure the Survey is for you?**

**Read the [letter of invitation from Damascus Citizens for Sustainability](#).**

**Pay a visit to [ATSDR's website](#) and to [DamascusCitizens.org](#).**

**And remember, we're just a click away by email.**

**We welcome input from gas/oil industry workers/employees.**

**Get the Survey here**  
[www.DamascusCitizensATSDR.org](http://www.DamascusCitizensATSDR.org)

**Contact about the Survey**  
by email at: [NaturalGasHealthSurvey@DamascusCitizensATSDR.org](mailto:NaturalGasHealthSurvey@DamascusCitizensATSDR.org)  
or write to us at: DCS, P.O. Box 147, Millersville, PA 17340 phone: (845) 252-6677

**About Damascus Citizens** <http://www.damascuscitizensforsustainability.org/about-us/>  
**About ATSDR** <http://www.damascuscitizensatdrr.org/about-atdrr/>

Damascus Citizens for Sustainability is a 501(c)(3) organization. [www.DamascusCitizens.org](http://www.DamascusCitizens.org)

On the right side of the page, there is a red box titled "Choose the Survey website that suits you best:" with two options: "Digital version" and "Download PDF".



in some states in the USA  
doctors are gagged

<http://blog.shaleshockmedia.org/wp-content/uploads/2013/04/dr-gag-300x177.jpg>

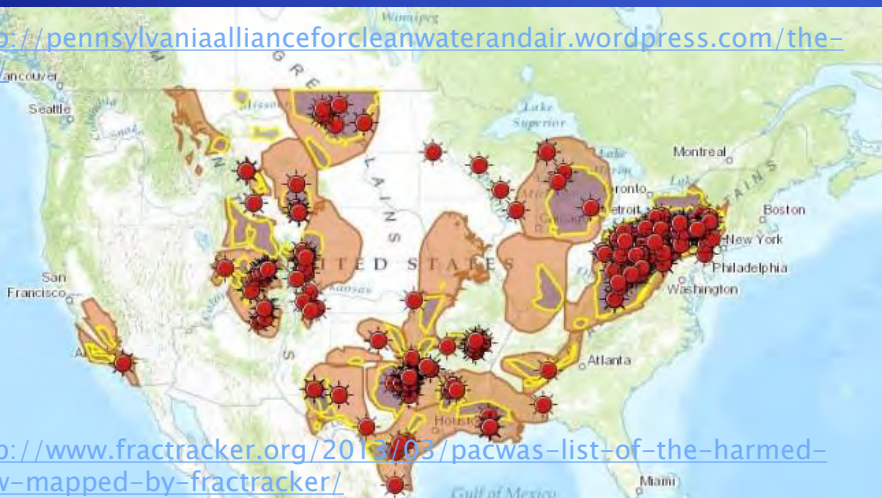
Instead...

<http://climate-connections.org/2013/08/02/range-resources-attorney-seeks-gag-order-on-7-and-10-year-old-in-pittsburgh-area-shale-gas-case/>



Jenny Lisak's List of the Harmed now has  
over 1500 names

<http://pennsylvaniaallianceforcleanwaterandair.wordpress.com/the-list/>



<http://www.fractracker.org/2013/06/pacwas-list-of-the-harmed-now-mapped-by-fractracker/>

non-disclosure agreements are  
common, and prevent important  
information-sharing

# What have medical professionals observed in the gas drilling areas?

From Dr David Brown's presentation at the National Academy of Sciences workshop--  
Review of SWPA\_EHP experience

[http://sites.nationalacademies.org/xpedio/groups/dbassesite/documents/webpage/dbasse\\_083486.pdf](http://sites.nationalacademies.org/xpedio/groups/dbassesite/documents/webpage/dbasse_083486.pdf)

## Potential Airborne Hazards from Natural Gas Extraction

- Barium
- Arsenic
- VOCs
- PAHs
- BTEX
- Methylene chloride
- Glycols
- Fine particulate matter
- Carbon monoxide
- Silica dust
- Radium
- Acetaldehyde/Formaldehyde

## Potential Waterborne Hazards from Natural Gas Extraction

- All the chemicals listed above, plus
- Biocides
- Microbial contamination
- Components of drilling solvents
- Lithium

The necessary criteria for designating a symptom as attributable to gas extraction activities included:

- **Temporal relationship** – Development of symptom (or exacerbation of pre-existing symptom) after onset of gas extraction activities
- **Plausible exposure** – Identifiable exposure source in proximity to individual experiencing symptoms
- **Absence of a more likely explanation** – Symptoms were not attributed to gas extraction activities if an individual had an underlying medical condition that was as (or more) likely to have caused the symptom

## Health Symptoms Temporally Associated with Gas Drilling Activities

• **Most common symptoms experienced by individuals and families evaluated by SWPA-EHP:**

### Symptom/% of Individuals

- Skin rash or irritation/48%
- Nausea or vomiting/45%
- Abdominal pain/38%
- Breathing difficulties or cough/41%
- Nosebleeds/21%

• **Other common complaints from SWPA-EHP clients population include:**

- Anxiety/Stress
- Nervous system problems including headaches and dizziness
- Eye irritation
- Throat irritation

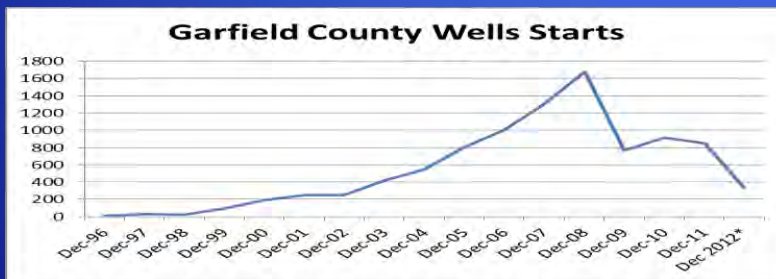
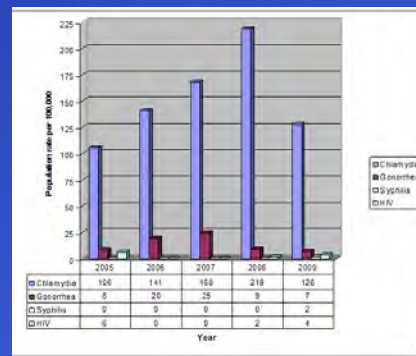
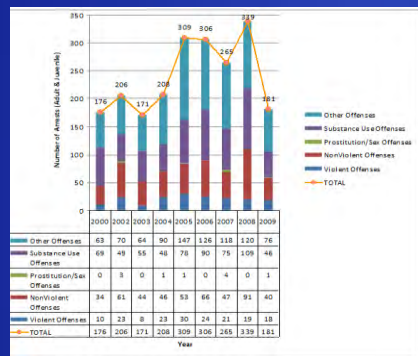
# What have medical professionals observed in the gas drilling areas?

**Public Health Risks of Shale Gas Development** by John L. Adgate, Bernard D. Goldstein, and Lisa M. McKenzie

[http://sites.nationalacademies.org/xpedito/groups/dbassesite/documents/webpage/dbasse\\_083235.pdf](http://sites.nationalacademies.org/xpedito/groups/dbassesite/documents/webpage/dbasse_083235.pdf)

“... the major stressors for both the working and community populations fall into eight major categories: air emissions, ground and surface water contamination, truck traffic; noise and light pollution; accidents and malfunctions; strain on health care systems, psycho-social stress associated with community change, and loss of property values.”

“Health Effects...are associated with both short and long-term health risks in both worker and community populations. In worker populations the most serious risks are job-related mortality from worksite or traffic accidents. Based on existing data from conventional hydrocarbon development industries the principal chronic morbidity concerns for shale gas workers are thought to be silicosis and cancers associated with hydrocarbon exposures (e.g., leukemia) as well as respiratory and dermal diseases related to these exposures. People living near shale gas operations report noticeable odors and, in some cases, upper respiratory, neurological, and dermatological symptoms that they consider related to development and production activities. Though little substantive research has been published on this topic, recent studies indicate a potential for health risks from the combination of physical, chemical, and nonchemical stressors associated with rapid change in communities. **Despite the demonstrated contact with chemical and nonchemical stressors and broad public concern, no comprehensive population based studies of the public health impacts of unconventional natural gas operations have been published.**”



“... there is both substantial public concern and substantial uncertainties that need to be addressed before we can reasonably quantify the likelihood of occurrence or magnitude of adverse health effects in workers and communities where development will likely occur.”



# What are health professionals in the US doing?



## Continuing Medical Education Series on Shale Gas Development

Physicians, Scientists & Engineers for Healthy Energy  
[www.PSEhealthyenergy.org](http://www.PSEhealthyenergy.org)

Summary Report, Human Health Risks and Exposure Pathways of Proposed Horizontal Hydrofracking in New York State:

<http://www.grassrootsinfo.org/summaryreport.pdf>



Drs Michelle Bamberger and Robert Oswald are the guest editors of an online journal *New Solutions: A Journal of Environmental and Occupational Health Policy*

[http://www.psehealthyenergy.org/Impacts\\_of\\_Gas\\_Drilling\\_on\\_Human\\_and\\_Animal\\_Health](http://www.psehealthyenergy.org/Impacts_of_Gas_Drilling_on_Human_and_Animal_Health)

Drs Adgate, Witter and Wernham were the lead authors on the first Health Impact Assessments on gas drilling  
<http://www.garfield-county.com/environmental-health/battlement-mesa-health-impact-assessment-draft2.aspx>  
<http://www.who.int/hia/conference/wernham.pdf> and <http://www.hiaguide.org/hia/national-petroleum-reserve-alaska-oil-development-plan>



Dr Sandra Steingraber has been an outspoken advocate for health rights, and co-founded [www.concernedhealthny.org](http://www.concernedhealthny.org)

The Southwest Pennsylvania Environmental Health Project

<http://www.environmentalhealthproject.org> has published a *Medical Toolkit* for medical professionals.



Wilma Subra and Nadia Steinzor of Earthworks Oil and Gas Accountability Project conducted and published a survey of common health complaints *Gas Patch Roulette: Full Report*

EARTHWORKS



TEDX

The Endocrine Disruption Exchange

Dr Theo Colborn has been documenting health impacts of chemicals and air toxins in Colorado

These New York State medical organizations have asked for a moratorium so that scientific studies could be done prior to the decision on gas drilling in NY

- **American Academy of Pediatrics, District II, New York State**
- **Mt. Sinai Children's Environmental Health Center**
- **NYS Conference of Environmental Health Directors**
- **Bassett Healthcare Network Board of Trustees and the Medical Staff**
- **THE MEDICAL SOCIETIES *of the NY Counties of* ONEIDA, HERKIMER, BROOME, MADISON, OTSEGO, OSWEGO, CAYUGA, CHENANGO, ONONDAGA, TOMPKINS**
- **Medical Society of the State of New York**
- **Physicians for Social Responsibility**
- **Concerned Health Professionals of NY**



# Medical Society of the State of New York calls for a Moratorium

- **RESOLVED**, that the Medical Society of the State of New York reaffirm its Policy on high-volume hydraulic fracturing that states:  
*“The Medical Society of the State of New York supports a moratorium on natural gas extraction using high volume hydraulic fracturing in New York State until valid information is available to evaluate the process for its potential effects on human health and the environment”* (Council Action, December 9, 2010); and be it further
- **RESOLVED**, that the Medical Society of the State of New York supports the planning and implementation of a Health Impact Assessment to be conducted by a New York State school of Public Health: and be it further
- **RESOLVED**, that the Medical Society of the State of New York advocate for the establishment of an industry-funded, independently-arbitrated state trust fund for people that may be harmed as a result of hydraulic fracturing: and be it further
- **RESOLVED**, that the Medical Society of the State of New York oppose any non-disclosure provisions related to the practice of hydraulic fracturing that interferes with any aspect of the patient-doctor relationship and/or the ready collection of epidemiological data for future health impact studies.



There is a process which brings public health to the table and which can inform land use decisions and should be used **prior to the development of regulations and before permitting**. It is particularly important in the case of gas exploration and production because health impacts, especially on the most vulnerable, have not been adequately studied. In New York the government agency reviewing this issue has refused to order such a study, despite requests from numerous medical organizations.

The Committee on **Health Impact Assessment**  
of the Board on Environmental Studies and Toxicology  
in the Division on Earth and Life Studies  
of the National Research Council **defines** HIA thus:

**“HIA is a systematic process that uses an array of data sources and analytic methods and considers input from stakeholders to determine the potential effects of a proposed policy, plan, program, or project on the health of a population and the distribution of those effects within the population. HIA provides recommendations on monitoring and managing those effects.”**

“Improving Health in the United States: The Role of Health Impact Assessment”  
[http://www.nap.edu/catalog.php?record\\_id=13229](http://www.nap.edu/catalog.php?record_id=13229)

An HIA would add value to the shale gas extraction decision because it would include:

- the current health literature
- the medical profession
- possible exposure pathways, even if remote
- direct and indirect impacts on all the determinants of human health
- all population groups—the vulnerable, workers and community units
- recommendations which would improve health outcomes



## CONCERNS OF PEDIATRICIANS

On June 7, 2010, The American Academy of Pediatrics, District II, NYS, representing more than 6,000 pediatricians and the millions of children across the state, wrote a memo to the NYS Legislature strongly supporting A10940/S7592, a bill for a moratorium on gas drilling.

“AAP, District II, NYS membership is concerned about the potential negative impacts on water, air, soil contamination, increased traffic and possible spills of contaminated materials in areas where many children and families live. Allowing time for the EPA study will allow our state leaders to move forward on this issue fully informed about whether hydraulic fracturing is a good public policy for our state.”

The bill passed in both houses of the Legislature, and then the Governor vetoed it.



Mount  
Sinai

Children's  
Environmental  
Health Center

submitted testimony at the NYC Council and EPA hearing. Their comments focused primarily on the impacts gas drilling would have on children.

On August 24, 2010, pediatrician Kevin Chatham–Stephens MD testified:

“...As pediatricians specializing in environmental medicine, we at The Center for Children’s Environmental Health are opposed to the current use of hydraulic fracturing not only due to the multiple known risks to children’s health, but also due to the substantial lack of research into the health effects of this practice. While this particular void in research is prominent and must be addressed, multiple health concerns have already been brought up by a wide range of individuals and groups, from rural communities to political bodies and environmental organizations to public health experts. Some of these concerns include:

- Contamination of drinking water
- Increased air pollution due to industrial traffic and the production process
- Psychological effects from accidents or other traumatic events...”



"Hydrofracking has the potential to significantly destroy the water, air and soil of communities in and around the drilling areas and to effect large state aquifers providing water for millions of families across New York," said Henry Schaeffer, MD, FAAP, Chair, American Academy of Pediatrics, District II, NYS. "As pediatricians, we are very concerned about how the negative environmental outcomes may impact children's health, development and general well being in the hydrofracking areas and beyond. Children are far more susceptible to environmental toxins, since they absorb and metabolize toxins at a higher rate for their body mass."

"As the doctors who care for children, we urge caution and more study." Dr. Schaeffer said. "Our children are depending on us to protect them. And in this instance, we must take a stand and do just that. We urge New York state government and our state's citizens to slow down what appears to be an unnecessarily fast approval process for hydrofracking in New York."

From a press release , October 5, 2011

**In New York,  
the medical  
community  
recommends:**



- Educate [www.concernedhealthny.org](http://www.concernedhealthny.org) and [www.psehealthyenergy.org/courses](http://www.psehealthyenergy.org/courses) and advocate for patients [www.environmentalhealthproject.org/](http://www.environmentalhealthproject.org/) and <http://www.aoec.org/pehsu.htm>
- Reverse all the exemptions from federal environmental laws
- Provide information and opportunity for informed consent
- Enact laws which protect people, especially the most vulnerable
- Prohibit non-disclosure agreements
- Provide funding for much needed research
- Use the Health Impact Assessment as a process to inform decision-makers and the public prior to the decision
- Prohibit drilling while studies are being done and evaluated
- Focus on renewables
- Follow the Precautionary Principle
- Only after we gain a clear understanding of why people become ill near gas drilling operations can a decision be made whether to permit this activity



Thank you

Source: <http://passaicnews.wordpress.com/>



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[www.concernedhealthny.org](http://www.concernedhealthny.org) for updated peer-reviewed articles, reports and testimonies from health professionals

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