

# *Fracking Facts*

*Skepticism is the first step to Truth – D. Diderot*

Albemarle County BOS

July 2, 2014 presentation

by

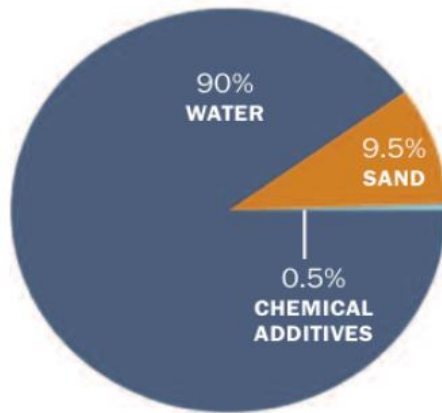
Charles Battig, MD

VA-Scientists and Engineers for Energy and  
Environment

# U.S. EPA, GAO...

- EPA secretary Lisa Jackson: “I’m not aware of any proven case where [hydraulic fracturing] itself has affected water,” Jackson said in May 2011.
- April 2012, Jackson said, “In no case have we made a definitive determination that [hydraulic fracturing] has caused chemicals to enter groundwater.”
- U.S. Govt. Accountability Office (GAO): “[R]egulatory officials we met with from eight states – Arkansas, Colorado, Louisiana, North Dakota, Ohio, Oklahoma, Pennsylvania, and Texas – told us that, based on state investigations, the hydraulic fracturing process has not been identified as a cause of groundwater contamination within their states.” (September 2012)

# Not So Secret Fracking Fluid



Compound	Purpose	Common application
<b>Acids</b>	Helps dissolve minerals and initiate fissure in rock (pre-fracture)	Swimming pool cleaner
<b>Sodium Chloride</b>	Allows a delayed breakdown of the gel polymer chains	Table salt
<b>Polyacrylamide</b>	Minimizes the friction between fluid and pipe	Water treatment, soil conditioner
<b>Ethylene Glycol</b>	Prevents scale deposits in the pipe	Automotive anti-freeze, deicing agent, household cleaners
<b>Borate Salts</b>	Maintains fluid viscosity as temperature increases	Laundry detergent, hand soap, cosmetics
<b>Sodium/Potassium Carbonate</b>	Maintains effectiveness of other components, such as crosslinkers	Washing soda, detergent, soap, water softener, glass, ceramics
<b>Glutaraldehyde</b>	Eliminates bacteria in the water	Disinfectant, sterilization of medical and dental equipment
<b>Guar Gum</b>	Thickens the water to suspend the sand	Thickener in cosmetics, baked goods, ice cream, toothpaste, sauces
<b>Citric Acid</b>	Prevents precipitation of metal oxides	Food additive; food and beverages; lemon juice
<b>Isopropanol</b>	Used to increase the viscosity of the fracture fluid	Glass cleaner, antiperspirant, hair coloring



Source: DOE, GWPC: Modern Gas Shale Development in the United States: A Primer (2009).

# Natural Gas Wellheads



# Wind Turbines, Laurel Mountain, WV





# Attention: Sierra Club, SELC, 350.org

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## Feds nix eagle penalties for California wind farm

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AP Photo/US Fish and Wildlife Service

### Feds nix eagle penalties for California wind farm

A golden eagle is shown in this undated, handout photo provided by the U.S. Fish and Wildlife Service. The U.S. Fish and Wildlife Service said Thursday, June 26, 2014 that a California wind farm will become the first in the U.S. to avoid prosecution if eagles are injured or die when they run into the giant turning blades.

Posted: Thursday, June 26, 2014 6:48 pm |

Associated Press |

FRESNO, Calif. (AP) — A California wind farm will become the first in the nation to avoid prosecution if eagles are injured or die when they run into the giant turning blades, the U.S. Fish and Wildlife Service said Thursday.

The Shiloh IV Wind Project LLC, 60 miles east of San Francisco, will receive a special permit allowing up to five golden eagles to be accidentally killed over five years. Previously, such a violation could potentially draw criminal charges and discourage private investment in wind farms known for catching birds in their rotors.

The permit will require the facility to take steps to prevent eagle injuries and deaths from electrocution by retrofitting 133 power poles. The permits are not required of wind farms, and federal prosecutors have only once filed criminal charges

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# Ridgeline Bird Killers



# Wind Turbine Land Grab

- A nuclear plant has a power density of about **2,500** watts per square meter.
- Large gas turbines (>100 MW) stationary set-ups can easily deliver **4,000-5,000** W/m<sup>2</sup>.
- •Most large modern coal-fired power plants generate electricity with power densities ranging from **100 to 1,000** W/m<sup>2</sup>, including the area of the mine, the power plant, etcetera
- Compare that to the power density of wind energy, which is **one watt** per square meter



# Renewable Corn Ethanol And Biodiesel Require Massive Amounts Of Water

- According to the U.S. Department of Energy, fracking requires just **0.6 to 5.8 gallons** of water per million Btu of energy produced.
- “Renewable” and “sustainable” corn-based ethanol requires **2,510 to 29,100 gallons** per million Btu of usable energy, and biodiesel from soybeans consumes **14,000 to 75,000 gallons** of water per million Btu.

# Solar Energy Farm Displaces Farm Land



<http://www.lightsource-re.co.uk/operational-assets/case-studies/shipton-bellinger-solar-farm-4-5-mwp/>