

LWVCA STUDY PAGES—NOVEMBER 2012 FRACKING

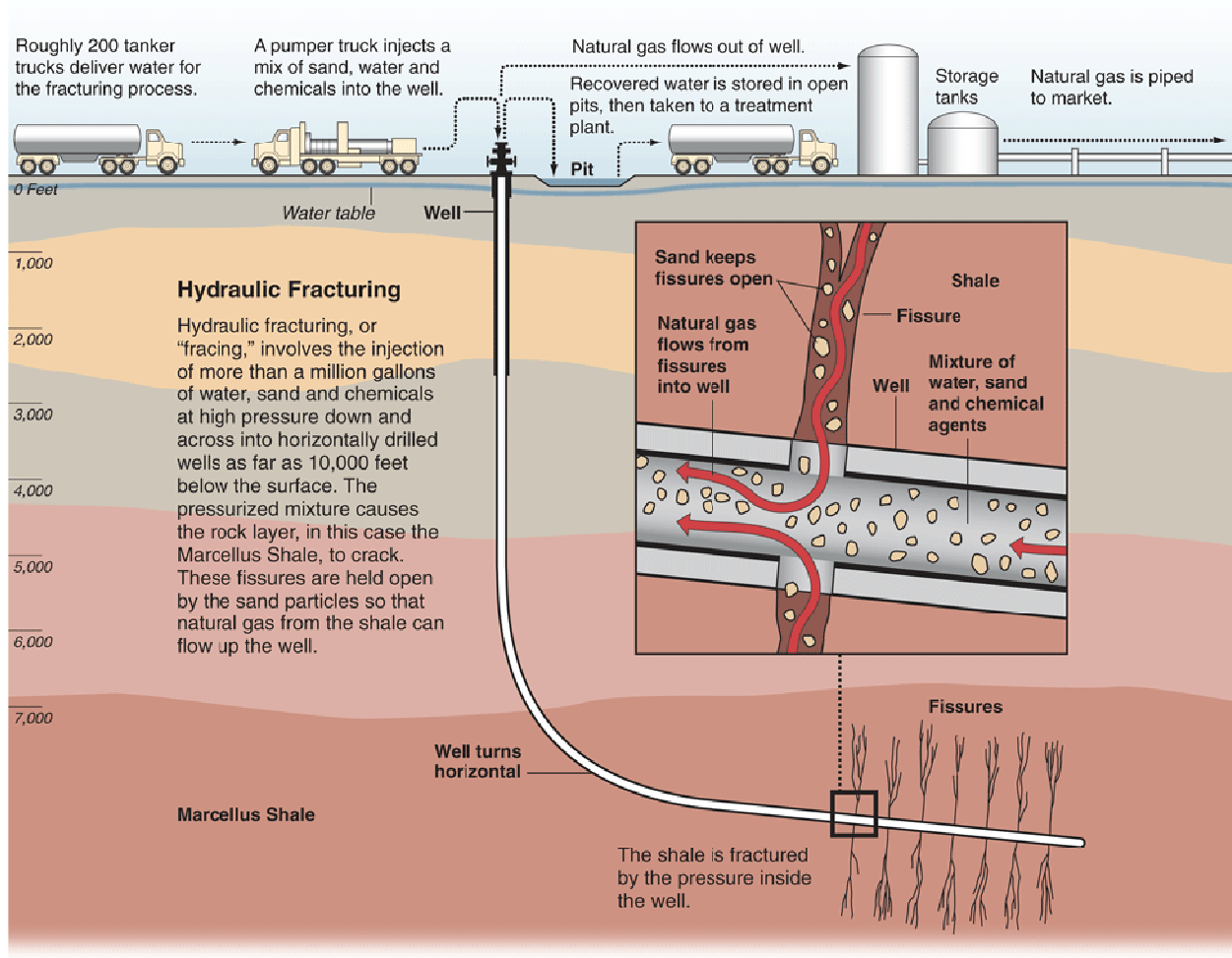
Prepared by the Natural Resources Committee For Unit Discussion

INTRODUCTION

Cheap, abundant natural gas and oil produced in the U.S. is changing our lives, but the controversial technology called "fracking" used to produce it has raised many concerns. The purpose of this study is to explore the impacts, both good and bad, of fracking; and the action steps that LWVCA might want to consider in addressing these issues.

"Fracking" has become the moniker for hydraulic fracturing of oil- and gas-bearing rock layers that lie deep underground in many parts of this country and the rest of the world. Fracking is used where gas is dispersed in tiny pore spaces and fissures in shale, sandstone and coal - as compared to the cavities that can be tapped by conventional wells. Newly developed horizontal drilling techniques allow multiple wells to radiate out as much as a mile from a central well shaft. The gas and oil in the rock is released to the well by hydraulic fracturing and the channels are propped open by sand and chemicals carried in the fracking water. The result is greatly lowered production cost, greatly expanded sources of domestic oil and natural gas production, and potential large scale impacts on human and environmental health.

Please view the diagram of a fracking site to familiarize yourself with the components and technology of such well sites.



Source: ProPublica. The original can be found at www.propublica.org/special/hydraulic-fracturing-national.

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Fracking needs millions of gallons of water with its load of sand and chemicals for each well. Within the first few weeks after releasing pressure, 40% to 60% of the mix blows back to the surface. "Blow back" water carrying natural gas and oil, fracking chemicals, salt and radioactive material picked up from the shale must be captured, stored and treated before reuse or release because of its load of toxic pollutants. In Ohio, much of the drilling waste water is disposed of by injection into deep wells.

Air, water, and land contamination and the associated health concerns, community disruption and stress during the drilling and production stages, have led to public resistance and pressure on all levels of government to regulate or even ban fracking.

Energy companies have resisted these efforts and governments at all levels are confronted with conflicting needs for revenues, jobs and associated economic developments, and the responsibility to protect public health, safety, infrastructure, and the environment.

Regulation of the fracking industry takes place primarily at the state level since the U.S. Congress exempted fracking from the federal requirements of the Clean Water Act in 2005. (See cleanwater.org/page/fracking-laws-and-loopholes.)

Presently, as Ohio's governor and legislature actively address these issues, the fracking industry looks to Ohio's oil and gas-bearing Utica shale beds underlying the eastern part of the state. LWVO does not have a specific fracking position, but considers clean air and clean water positions highly relevant. LWVCA and its Natural Resources Committee have remained in close contact with the state League and with other organizations pursuing the issues.

IMPACTS OF FRACKING:

The benefits of an abundant, low priced domestic supply of natural gas and oil from fracking of oil and gas bearing shales are broadly felt but not easily recognized. Similarly, the environmental and social costs of fracking, while acute for individuals and communities where the drilling takes place, may not be recognized by many of the beneficiaries.

1. Economic Impacts

Jobs - Relatively high national levels of unemployment have made new jobs a high priority. A recent study by Citigroup estimated that fracking extraction of oil and gas from shale could add as many as 3.6 million net new jobs in the U.S. and Canada over the next 8 years (WSJ, 8/25-26/2012). Fracking of oil shale in North Dakota has meant high paying jobs and unemployment rates below 1% in some counties (WSJ, 5/16/2012; NYT, 7/26/2012, A23). Demand for sand for fracking alone has added 1000 new jobs in Wisconsin and 100 in Nebraska (WSJ, 2/8/2012, A12). Fracking jobs go mostly to skilled workers from out of state energy companies but expanded demand for services and housing creates [local jobs](#).

Energy Industry supporters may overstate the jobs benefits. Since 2005, jobs in oil and gas extraction have increased by over 50% but that is only 70,000 jobs, not a significant dent in national unemployment numbers (NYT, 3/16/2012, A23). In a study commissioned by the Marcellus Shale Coalition, researchers with Penn State University estimated that gas drilling would support 216,000 jobs in Pennsylvania alone by 2015. As of January 2012 data from the Bureau of Labor Statistics show employment in the oil and gas industry to be 4,144 in Pennsylvania. (Center for Economic and Policy Research. (www.cepr.net/index.php/blogs/cepr-blog/fracking-nonsense-the-job-myth-of-gas-drilling))

Lower cost oil and gas helps to revive domestic manufacturing which may contribute to increased jobs in the non-energy sector (WSJ, 8/25-26/2012, A13). Steel companies building new cheaper plants use a new process that

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replaces metallurgical coal with low cost natural gas. (WSJ, 6/13/2011, A15) Low cost, abundant fracked gas liquids (ethane, propane, butane) serve as key feed stocks for making the petrochemicals used in the production synthetic rubber, plastics, fibers and lubricants. Major expansions in the petrochemical industry are underway as a result (WSJ, 6/27/2012, B10).

Land values - Rural land owners in impoverished southeastern Ohio are receiving substantial oil and gas leasing checks for their oil and gas rights (NYT, 6/5/2012, A11). As of mid-2012, mineral rights holders have received \$4 billion. Standard leases negotiated individually by land owners with energy companies amount to \$20 to \$30 an acre, one sixth royalty on production, and no protection for water and land. Recently, a land owners association in Eastern Ohio, negotiating collectively was able to lease for \$4000 an acre, 19% royalties, and safeguards to protect water and land (NYT, 6/5/2012, A11).

While owners of mineral rights may benefit, neighbors might not. The Colorado School of Public Health made the following statement regarding oil and gas drilling in Battlement Mesa, CO: "Natural gas development causes a decline in property value, especially during the development phase of the project and land values partially recover when the development phase of a project ends. Land values effects will be impacted by how well other concerns, such as air emissions, traffic, noise and community wellness, are mitigated."
www.savecoloradofromfracking.org/harm/propertyvalues.html

Energy costs - Fracking of gas shale dramatically increased the supply and lowered the cost of natural gas. In mid-2012, oil was priced at \$91/barrel while the per-barrel equivalent for natural gas was \$15.80. In addition, the liquids separated from natural gas are used to replace oil as a feedstock for the chemical industry and were priced at \$35/barrel (WSJ, 6/25/2012 pC8).

Fracking gas and oil have lowered gasoline prices in the U.S. by lowering raw material and energy costs for refineries (WSJ, 8/4 -5/2012, B14). A key refinery in Philadelphia earmarked closing switched from imported West African crude oil to fracked oil from North Dakota and fracked gas for reduced power costs. Closing the refinery had threatened to raise the price of Northeast gasoline by 20 to 30 cents/gallon and disrupt heating oil supplies (WSJ, 8/22/2012, A1).

Some electric power companies plan to or have switched from coal to gas for new generating plants and converting older coal fed plants to gas to avoid costly anti-pollution upgrades mandated by the Clean Air Act. This has led to disagreements within the industry over regulatory policy. (WSJ, 11/10/2011). The U.S. Energy Information Administration expect utilities to increase natural gas usage by 20% this year (WSJ, 6/5/2012, C4).

The revival of nuclear power from current reactor designs has been derailed by the availability of abundant inexpensive gas for power generation (WSJ, 3/7/2012, B7; WSJ, 3/16/2012 p A1). Fourth generation designs that are safe, cleaner and cost competitive with natural gas are still several decades away (WSJ, 3/26/2012, R4). Avoiding huge investments for power generation means lower electricity rates for homes and businesses.

Wind generated electrical energy stays competitive with natural gas when gas is priced at \$6/ million BTUs according to T. Boone Pickens, an advocate for both (WSJ, 3/26/2012, R4). With recent gas prices at half that level or less, wind is at a disadvantage. (WSJ, 4/5/2011, B9) Solar and wind energy provide 1% of U.S. energy now and are projected by the U.S. Energy Administration to rise to 3% by 2035 unless major technology breakthroughs occur ((WSJ, 8/25-6/2012). Critics of carbon-based energy point out that society pays the environmental, climate, and social costs to subsidize the low cost of fracking gas and oil.

Competitive advantage - Every part of our economy is impacted by energy costs. Consumers benefit from lower energy prices generally, but particularly in home heating and cooling costs. Lower energy costs provide competitive advantage to business and industry locally, nationally and internationally (WSJ, 1/12/2012; WSJ, 2/8/2012, A1).

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Competing companies in Asia pay six times as much for natural gas. Nucor is building a new direct-reduced-iron steel plant costing one quarter of what a conventional plant would cost by using a direct-reduced-iron process based on low cost natural gas . Replacing coal with gas will reduced carbon dioxide emissions (WSJ, 6/13/2011, A15). online.wsj.com/article/SB10001424052702304432304576369140191493636.html.

Lower transportation costs - Local trucking and busing has rapidly switched to natural gas. U.S. Auto Makers introduced pickup trucks powered by natural gas (WSJ, 3/5/2012, B1). Lack of natural gas refueling stations has limited long range transportation applications, but the cost advantages have resulted in multiple initiatives to create the needed natural gas delivery infrastructure (NYT,6/22/2012, B-7).

New demand for services and supplies - 30 million tons of sand mined in the upper mid-west for use in fracking from North Dakota to Pennsylvania will result in a five-fold increase over previous levels (WSJ, 5/14/2012, A3). Fracking of shale in water-limited areas requires the purchase and transport of enormous amounts of water from municipal water systems and private water companies. Treatment and disposal of very large quantities of waste water create new demands on municipal and private facilities. Safety and environmental regulatory supervision of compliance will need to expand.

Increased government revenue - Royalties, taxes, and fees for service and permitting can significantly add to revenue for all levels of government. At the national level, reduced oil imports, reduced inflationary pressures, and balance-of-payments improvements are important economic goals served by fracking gas and oil.

A Citigroup study reported that increased tax revenue from oil and gas extraction could cut the U.S budget deficit by 60% by 2020 (WSJ, 8/25-6/2012, A13). Ohio's Governor Kaisich has proposed an increase in the oil and gas severance tax for fracking wells to bring in additional state revenues. A study prepared for the Ohio Oil and Gas Association predicts an increase in local and state government tax revenue of \$1.05 billion in 2015 from development of the Utica Shale formation (Ohio Watchdog.org, July 18, 2012). However, industry has quite successfully influenced state legislatures to limit local control over tax and land use policy (NYT, 2/8/2012, A14).

The long-term impact of the boom on oil and gas drilling remains as yet unknown. These new supplies have come to market with demand down and have swamped the Nation's usage and storage capacity, driving natural gas prices down to record lows. States that rely on, or plan for, revenues from energy severance taxes will face considerable volatility from demand and price changes for some time in the future. blogs.reuters.com/muniland/tag/fracking/

2. Geopolitical Impacts

Since 1991 the U.S. has fought three wars in the Middle East, a region of great national importance to us because of our dependence on imported oil. In 2005 the U.S. imported 60% of our liquid fuels; today, 45% because of increased domestic production (fracking) and reduced consumption. This expected continuing market trend should enable the U.S. to have the flexibility for reconfiguring its foreign policy independently of its need for imported oil (NYT, 3/23/2012, A1; WSJ 6/22/2011, A14; WSJ, 6/27/2012, A1).

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3. Environmental and Health Impacts

Fracking gas and oil wells raise not only health and environmental safety concerns but also potential benefits. Gas and oil production by means of horizontally drilled and hydraulic fractured wells has proceeded without the science needed to prove the safety of the process. Congress exempted the process from regulation under the federal Clean Water Act and states permit fracking even though a long list of technical questions regarding contamination of drinking water are unanswered (Scientific American, Editorial Board, November, 2011, page 12).

Reduced coal mining and burning -

Electric generation from coal-burning power plants has supported a coal mining industry that has seen a doubling of black lung disease in miners in the last decade (PBS NewsHour, 7/9/2012; Huffington Post, 7/12/2012).

Communities blame coal-burning power plants for air pollution-related health problems such as respiratory illness and possibly developmental disabilities among children attributed to mercury emissions (American Lung Association, *Toxic Air...3/20011*). Cheap natural gas has reduced demand for coal (WSJ, 2/7/2012, C7; WSJ, 7/10/2012, B2).

U.S. EPA has found that emissions of greenhouse gases such as carbon dioxide endanger public health and likely have been responsible for global warming. Having survived court challenges, the agency moves ahead with national limits on carbon dioxide from new coal burning plants. The new rules make new plants and retrofitting of old plants much more costly than switching to low cost natural gas which produces half as much CO₂ in plants that cost 1/3 as much (WSJ, 6/27/2012 A1). In early 2011 gas powered electric power plants produced only 1/5th of the CO₂ but 1/2 the electricity as coal-powered plants (NYT, 2/27/2011, A1, A22, A23)

Environmentalists hope to shut down 1/3 of the coal burning plants by 2020 with the expectation that the country will more than meet greenhouse gas reduction goals. Their campaign has received significant funding from Chesapeake Energy, a leader in the shale oil and gas fracking industry (NYT, 2/14/2012, A17; NYT, 5/30/2012, A1; WSJ 6/27/2012, A1).

Pollution of drinking water -

Drinking water comes from shallow aquifers and surface streams and reservoirs. Thousands of feet of rock generally separated drinking water sources from deposits of gas and oil. Wells drilled through the shallow aquifers to carry oil and gas to the surface must have encasing in multiple layers of steel pipe. Sealing these pipes into the surrounding rock with cement prevents pollution of the water. Unfortunately, a significant number of well-cementing jobs fail and the number failing increases with age. Recently, Pennsylvania's Department of Environmental Protection fined Chesapeake Energy, a leader in fracking well development, for contaminating 16 families' water wells with methane as a result of improper drilling practices (Scientific American, November 2011, pg. 82).

The Oil and Natural Gas Industry claims that gas will not migrate up to aquifer layers, but their own reports show that casing leaks are common. In fact, 6% leak immediately and within 15 years of age, 50% have failed completely. www1.rollingstone.com/extras/theskyispink_annotdoc-gasl4final.pdf

Fracking of horizontally drilled wells opens new potential routes for gas to reach drinking water by intersecting natural fissures or old abandoned conventional oil wells. Each horizontal well may be perhaps a mile in length and multiples of them may radiate out from a dozen or so vertical wells on a single drill pad. Shale fractures may radiate in three dimensions for as much as 2,000 feet from multiple points along each horizontal well bore. This multitude of new fissures leading out from the gas bearing shale strata increase the likelihood of gas finding its way through the protective thick rock overlay to the shallow aquifer.

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Fracking of the deep horizontal wells requires enormous quantities of water and chemicals. Each horizontal well uses 2 to 4 million gallons of water and 15,000 to 60,000 gallons of chemicals. The purpose of the chemicals is to lubricate the fracking flow, protect the pipe, and kill bacteria growing in the pipe and fissures that would clog gas flow. From 10% to 75% of the injected liquids return to the surface as flowback during the establishment of the production well.

The flowback water contains gas and oil, drilling chemicals, salts, and radioactive materials from the shale. This toxic water, also referred to as brine, needs storage on site until transported to treatment plants or processed for reuse. Recently, a Pennsylvania court sentenced a man to 7 years' probation for illegally dumping millions of gallons of shale gas waste water over several years into waterways, mine shafts, and holes. Regulators have cited drilling companies hundreds of times for illegal disposal of drilling waste water (WSJ, 6/16/2012).

The New York Times described waste water (generally stored in open air pits) as "smelling like raw sewage mixed with gasoline" (NYT, 2/27/2011, A22). Even in states that require geosynthetic liners to prevent seepage into ground water, liner tears, spills and pit overflows and runoff during heavy rains can cause pollution of surface waters. Most Pennsylvania frack waste water gets treated by municipal waste treatment plants, however the waste treatment process design will not remove salt or radioactive material and plants are not required to test the effluent for radioactivity.

Unpublished EPA and industry studies concluded that radioactivity in drilling waste effluent cannot be fully diluted in rivers and also that little testing was done at drinking water intakes downstream. Materials such as radium entering the body through eating, drinking or breathing can cause cancer. Because of contamination from fracking Pittsburgh had to shut down its water intake from the Monongahela River and advised bottled water for drinking during a period of low water flow (Regulation Lax as Gas Wells' Tainted Water Hits Rivers, NYT, 2/26/2011).

Locally, while most drill sites are located in eastern Ohio, the risk to drinking water containing toxic fracking waste water extends to Cincinnati's aquifers as well. Ohio permits deep well injection of liquid hazardous waste and the Mt. Simon Sandstone in western Ohio is considered the best injection zone. Statewide injections of toxic wastes totaled 3,371,898 barrels in the 3rd quarter of 2011 (ODNR, OKI Groundwater Committee Meeting, 3/7/2012).

Injection wells are structurally the same as an oil or gas well. Ohio's Division of Oil and Gas Resource Management (DOGRM) regulates injection wells. Nationally, inspections of 17,000 wells from 2007 through 2010 found one in six to be in violation of well integrity standards and the walls of 7000 wells showed signs of leaking. www.scientificamerican.com/article.cfm?id=are-fracking-wastewater-wells-poisoning-ground-beneath-our-feeth

USEPA regulates such wells and classifies them into five categories depending on the degree of hazard of the material being injected and sets standards accordingly. The energy industry succeeded in having all material resulting from the oil and gas drilling process considered exempt from laws on hazardous waste. Waste water brine has been sold for use to treat icy roads and waste water to settle road dust. Pollutants eventually enter the environment (NYT, 3/2/2011).

Diversion of essential groundwater -

Shortages of good water can also be exacerbated by the enormous water requirements for fracking. Eastern Ohio has very limited ground water so drillers have turned to municipal and private suppliers. Ohio's government has considered making state public waters (including scenic rivers) available to the industry (www.shalereporter.com/opinion/article_9984d196-bf09-11e1-bd8b-0019bb30f31a.html) reprinted from the *Columbus Dispatch*). Farmers worry that water taken for fracking will endanger water available for their crops and livestock, especially during drought periods (Letter to the Editor, *Columbus Dispatch*, 04 July 2012). Naturalists are concerned about the endangerment of irreplaceable river habitats (www.ohiobirds.org/conservation/FrackingLetter.pdf).

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Pollution of air -

While preparing fracking wells for production, fracking fluids, oil and gas flows to the surface, occasionally with nearly explosive force called a “blow back”. Nationally, gases vented through the well bore holes during fracking emit 290,000 tons of smog-forming volatile organic compounds and up to 20 tons of benzene per year according to the U.S. EPA. In the past, gases have been vented to the air during the weeks prior to capture for gas production. Effective June 18, 2012, USEPA regulations require that these gases be flared (burned); and from 2015 on, captured. Flaring converts the smog and greenhouse gas compounds to CO₂ and water (CO₂ is 1/20 as impactful as methane as a greenhouse gas). Capture will lead to a 95% reduction in emissions and conservation of \$30,000,000 worth of wasted natural gas (EPA Press Release dated 04/18/2012; USA Today 4/20/12). Currently, the capture technology is use in only about half of the new fracking wells being drilled nationally.

Methane, the principle component of the vented gases, is twenty times more powerful than carbon dioxide as a climate changing “greenhouse” gas. Capturing the gas will reduce climate changing emissions by 28 million to 44 million tons a year. Other emissions captured are smog-producing volatile organic compounds linked to asthma and respiratory illness (190 to 290,000 tons/ year and 12 to 20 tons/year of toxic and cancer causing chemicals such as benzene and hexane (NYT, 4/19, 2012, A20).

Impact on land -

- **Earthquakes:** Small earthquakes of up to 2.8 magnitude have been linked to drilling in seismically vulnerable locations in the U.S., but are considered avoidable (Science News, 9/8/2012, p. 25) Injection of fracking wastewater into disposal wells created instabilities in surrounding layers of rocks leading to earth tremors and a dozen earthquakes in the Youngstown Ohio area according to Ohio Department of Natural Resources oil and gas regulatory agency (NYT, 2/2/2012, Associated Press, 3/9/2012). Disposal wells for waste water caused hundreds of earthquakes in Arkansas, one of 4.7 magnitude resulting in minor damage to homes and led to a six-month moratorium on new wells in the area (WSJ, 07/26/2011). U.S. Geological Survey scientists have related the dramatic increase in earthquakes in areas of fracking gas and oil production to fracking wastewater injection wells. The greatest magnitude U.S. earthquake linked to wastewater injection is 5.8 (Science news, 9/8/2012, p. 25; National Public Radio, July 19, 2012).
- **Sand mines:** In 2011 the sand mining industry sold over 12 million tons of frack sand. Mining for fracking sand in the upper Midwest and transporting it by truck, rail, and barge to drilling sites became a major enterprise that has raised concerns for loss of farm lands as well as other impacts (Wisconsin Center for Investigative Journalism, 7/23/2012). Sand mines impact air quality, health (silicosis), land, infrastructure, and quality of life. www.marcellus-shale.us/Marcellus_FRAC.htm

Pollution to water and air near well sites –

Contamination of drinking water from both private wells and public water supplies with toxic and radioactive materials from mining waste waters risks public health. Smog producing chemicals released during well development can contribute to asthma and other respiratory illnesses. A Cornell University review of case studies of animal health based on interviews with animal owners who live near gas drilling operations found implications of serious health effects on humans, companion animals, livestock, horses and wildlife (Oswald, R. E. Impacts of Gas Drilling on Human and Animal Health, New Solutions, Vol. 22(1) 51-77, 2012).

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4. Other Impacts

Safety - Drilling jobs prove dangerous with fatality rates 7 times the national average for all industries. One third of these deaths come from highway crashes, the largest single cause of fatalities in the Industry. Safety regulators blame the deaths on the long hours worked by oil field truckers under an exemption from highway safety rules (NYT, 5/14/2012). Workers handle and breath unknown chemicals, many known to have associated health risks (WSJ, 4/18/2011, A3).

Infrastructure - Trucks of all kinds are used at a well site. A sand truck may weigh as much as 30 tons. They run 24 hours a day, 7 days a week. www.marcellus-shale.us/Marcellus_FRAC.htm The typical well pad requires over 13,000 round trips of heavy semis over local roads, causing traffic congestion, and costing taxpayer money on repair and maintenance. Because of these correlated costs, it is important for municipalities to require performance bonds from drillers to cover damage to their roads and bridges. www.nofrackohio.com/local-elected-officials/

Quality of life -

The movie “Gaslands” details the negative effects on local communities when the fracking well development begins. Although, owners of mineral rights may see sudden wealth, neighboring properties and homes are apt to suffer losses in esthetic and economic value (WSJ, 7/27/2012, A3). Sometimes homeowners find they can no longer get a mortgage or home loan because of a gas lease they signed. www.energybulletin.net/stories/2012-05-20/how-fracking-mess-about-make-mortgagemess-worse

PROPOSALS FOR PROTECTING PEOPLE AND THE ENVIRONMENT

As fracking continues to expand, driven by a nation dependent on cheap domestic sources of energy, opposition to fracking grows rapidly. www.neogap.org/neogap/. Industry and their allies in government together with many owners of leasable land find themselves pitted against individuals and groups concerned with protecting the environment and public health. Opposition is divided between the outright ban favored by local groups and the stringent rules favored by national environmental organizations (NYT, 1/10/2012, A17).

Political and industry leaders push for compromise on regulations (WSJ, 2/9/2012, A6). Investigative news reports generally criticize the industry and political leadership for failing to adequately protect the public interest (NYT February/March 2011).

State legislation, regulation, and enforcement are the primary focus of efforts to capture the benefits of the technology while protecting against earthquakes, and pollution of land air and water (Hannah News Service, Inc., 5/7/2012). Federally, USEPA has issued rules requiring capture of smog producing and climate changing gases escaping from wells (USA Today, 4/20/2012). The Department of Interior is drafting rules for fracking on 700 million acres of public land. Local zoning laws prove helpful in protecting communities wanting to regulate or opt out from fracking (WSJ, 7/27/2012, A3).

Proposals for protecting the public are numerous. A sampling follows:

- A moratorium on fracking until safety questions has been answered. New York State adopted this policy but is considering drilling in impoverished areas outside critical watersheds.

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- Fracking chemicals should be fully disclosed to the public before fracking begins.
- Drillers should be required to post performance bonds to ensure that they do not walk away from their responsibilities.
- Water wells should be sampled before drilling starts so that a baseline for contamination from fracking can be clearly established. Harmless chemical markers should be added to well waste before disposal.
- State inspectors should certify successful cementing of well casings, blow back water management, waste disposal, and emissions controls before production begins.
- Landowners and communities should have access to advance training in how to protect their interests in dealing with energy companies.
- The country should sustain the search for alternative green energy solutions while using gas as a transitional energy source where coal burning in polluting plants is halted.

EXISTING LEAGUE OF WOMEN VOTERS POSITIONS AND ACTIONS:

Ohio League—LWVO has not adopted new positions related to fracking, but instead, has used existing state and national positions on which to base advocacy efforts to improve proposed legislation and regulatory actions. This has including support in principle of Governor Kasich’s ideas for mandatory disclosure of fracking chemicals, encouraging waste water treatment and recycling, and imposition of a severance tax on oil and gas production. LWVO has opposed parts of the legislation introduced for implementation of those ideas such as a bill to allow drilling in State Parks which passed. LWVO has petitioned the Ohio Department of Natural Resources to locate fracking liquids injection wells away from population centers and critical infrastructure out of concern for associated risks of earthquakes.

Pennsylvania League—LWV of Pennsylvania adopted in May, 2010 a position on shale gas extraction that supports maximum protection of the environment and public health by requiring the use of best practices, comprehensive regulation, communication and adequate staffing across government agencies. The position encourages local jobs and economic development, but opposes drilling at the expense of natural recreation areas. It supports permitting fees and severance taxes to cover all public costs. shale.palwv.org/

National League—LWVUS on 9/19/2012 has submitted a public comment to the Bureau of Land management of the U.S. Department of the Interior regarding proposed rules intended to update the regulations governing hydraulic fracturing for oil and gas on Federal and Indian Lands.

The LWVUS supports:

- full disclosure of pollution data;
- management of land as a finite resource, not as a commodity;
- identification and regulation of areas of critical concern...including...rare or valuable ecosystems, significant wildlife habitats, unique scenic or historic areas, wetlands...and renewable resource lands where development could result in the loss of productivity (such as watersheds, aquifers, and aquifer recharge areas, significant agricultural and grazing lands, forest lands); and
- policies to ensure safe treatment, transportation, storage and disposal of solid and hazardous wastes in order to protect public health and air, water and land resources. www.lwv.org/content/league-comments-bureau-land-managements-proposed-fracking-regulation