# Overture: A Call for a Ban on Fracking

The Recommendati	tion	
------------------	------	--

The	recommends to the 222 <sup>nd</sup> General Assembly that the
Presbyterian Church (USA) endo	rse a ban on the process of hydraulic fracturing (also called
"fracking"), call on the federal, s	state and local governments to declare a ban on hydraulic
fracturing, and ask the churches	and all members of the Presbyterian Church (USA) publicly to
support such a ban.	

### The Rationale

A ban on fracking is supported by the following points:

- "The earth is the Lord's and all that is in it." (Psalm 24:1) As Christians we are called to honor
  the sanctity of life, to safeguard the life and well-being of all living things, and to protect
  God's creation from damage and destruction. When we support or ignore the hydraulic
  fracturing (fracking) process, we threaten the life and well-being of living things on earth,
  including ourselves.
- 2. This endorsement to ban hydraulic fracturing is supported by The Precautionary Principle—adopted by the 221<sup>st</sup> General Assembly in 2014, which states "an action should not be taken if the consequences are uncertain and potentially dangerous." The consequences of hydraulic fracturing have not been thoroughly tested, and the many negative and serious results of its widespread use show the fracking process threatens the health and life of human beings as well as living creatures due to the contamination of water and soil.
- 3. Fracking threatens our clean water.—Water is essential to life and it should be protected against contamination. Water should be available to all who need it as it has become a resource that is becoming more scarce and precious world-wide. In areas where fracking is done, studies have shown contamination of local aquifers. Fracking uses incredible amounts of water—5 to 13 million gallons per gas or oil well—and almost all of this water is not reusable. Also, water supplies are taken from local farmers and ranchers who need it. Water that is reusable is radioactive or, in the cleaning process, creates contaminants that are concentrated and difficult to dispose of. The construction of new well sites and supporting infrastructure takes up an average of 9 acres of land per well, increasing sediment deposits in streams and rivers due to erosion and disrupting the natural filtration of water into the aquifers by grasses and trees. Contaminants from spills, leaks and blowouts of toxic chemicals and oil and gas often enter local water sources.
- 4. The fracking process increases the rate of global warming. 97 percent or more of actively-publishing climate scientists agree that climate-warming trends over the past century are due to human activities. Global warming already causes hardship for human beings, especially the poor. Scientists predict that warming of the planet beyond 3.6 degrees Fahrenheit (2 degrees Celsius) may threaten human survival and life as we know it. Fracking releases methane and other hydrocarbons into the atmosphere—and methane causes atmospheric warming 25 times more than carbon dioxide according to the EPA. There is 17 times more

- methane in the air near shale gas development sites due to leaks. Leaking well casings, inadequately plugged abandoned oil and gas wells (often used for the deposit of fracking fluids), deteriorating casings and pipes of used or abandoned wells over time, and improperly centered well casings and their gradual settling—all lead to the release of methane and other climate-changing hydrocarbons.
- 5. Fracking causes an increase in earthquakes. Earthquakes, directly or indirectly, contribute to the loss of life and property. For decades the central and eastern U.S registered about 20 earthquakes of 3.0 magnitude or greater per year. In 2010-12, 300 earthquakes of 3.0 or greater occurred in that area, and about 200 of 3.0 or greater hit in the first-half of 2014 in Oklahoma alone. A magnitude 4.7 earthquake among a swarm of 1,000 smaller ones struck Greenbrier, Arkansas in 2010-11, and a magnitude 5.7 earthquake hit Prague, OK in 2011. Seismic waves created by earthquakes will increase the likelihood of leaking oil and gas wells.
- 6. The transport of oil produced by fracking creates the near certainty of disastrous explosions. Trains carrying oil have exploded in Quebec, West Virginia, Virginia, Alabama and North Dakota—risking life and destroying property. The Department of Transportation predicts an average of ten crude oil or ethanol derailments per year for the next two decades, causing billions in damages. The fear is that such derailments and explosions will occur in highly populated areas, such as Seattle or Minneapolis or Albany, NY.
- 7. The process of fracking creates many more pollutants in the air for which there is no containment—impacting the health of all in the vicinity, especially the children and the elderly, and causing environmental degradation. Clouds of silica dust arise at fracking sites from sand that is processed and mixed with fracking fluids, and silica is linked to lung cancer, obstructive pulmonary disease, kidney disease and autoimmune disease. Exhaust from diesel generators and large trucks, smoke from flaring well sites, and explosions create a stream of toxic air emissions. The fracking process brings up air pollutants from the depths of the earth including methane, benzene, toluene and other cancer-causing hydrocarbons, radon (a byproduct of radioactive radium), hydrogen sulfide and chemical vapor from the fracking fluids—the identity of which is protected by the Toxic Substances Control Act.
- 8. Fracking puts a strain on and causes damage to local communities. Where fracking is occurring, communities have their health and emergency response systems pushed to their limits. Schools are over-crowded, housing becomes scarce and expensive (especially difficult for the elderly and poor), crime and the transmission of sexually transmitted disease increase, and roads are damaged. Very little wealth is captured at the local level and outside investment in the community drops. The local land is altered and water supplies are put at risk.
- 9. Fracking supports our greater dependence on fossil fuels rather than moving us toward cleaner energy solutions such as wind, solar and higher efficiency. Resources and funds are being used to support our fossil fuel dependency, rather than investing in companies that will move the nation toward clean and sustainable energy use. The current hope based on the use of natural gas is misinformed because studies have shown that because of the fracking

- process, all the pollutants created (including methane) and other factors the use of natural gas will increase global warming at a higher rate than at present.
- 10. The PC(USA) has a moral and prophetic obligation to speak out against actions that damage, endanger or destroy the life and health of people, their future generations and all living things. To support a ban on hydraulic fracturing addresses one of—if not the greatest issue—the human race will face in the 21st century, namely, that human activity causes climate change. By endorsing a ban on fracking the church will take a stand against the unrestrained financial interests of those individuals and companies that knowingly neglect or misrepresent the negative impact of fracking on human life and on the environment. As a result the Presbyterian Church (USA) will show compassion for "the least of these," who will be most affected by the rising water, drought and fires, flooding and crop disruption brought on by climate change. This is a basic and great calling of the Church—to hold sacred and protect all life. This is not just a courageous stance; it is our responsibility.

#### References

# Rationale 1 (God's Earth)

**Genesis 1:1** In the beginning when God created the heavens and the earth,....

**Genesis 1:31** God saw everything that he had made, and indeed, it was very good.

**Genesis 1:27** So God created humankind in God's image, in the image of God he created them; male and female he created them.

**Genesis 2:15** The Lord God took the man and put him in the garden of Eden to till it and keep it.

Genesis 9:8-11 Then God said to Noah and to his sons with him, "As for me, I am establishing my covenant with you and your descendants after you, and with every living creature that is with you, the birds, the domestic animals, and every animal of the earth with you, as many as came out of the ark. I establish my covenant with you, that never again shall all flesh be cut off by the waters of a flood, and never again shall there be a flood to destroy the earth."

**Deuteronomy 10:14** Heaven and the heaven of heavens belong to the Lord your God, the earth with all that is in it.

**1 Chronicles 29:11** Yours, O Lord, are the greatness, the power, the glory, the victory, and the majesty; for all that is in the heavens and on the earth is yours; yours is the kingdom, O Lord, and you are exalted as head above all.

**Job 38:1-7** Then the Lord answered Job out of the whirlwind: "Who is this that darkens counsel by words without knowledge? Gird up your loins like a man, I will question you, and you shall declare to me. Where were you when I laid the foundation of the earth? Tell me, if you have understanding. Who determined its measurements-- surely you know! Or who stretched the line upon it? On what were its bases sunk, or who laid its cornerstone when the morning stars sang together and all the heavenly beings shouted for joy?"

**Psalm 65:4-5, 9-11** By awesome deeds you answer us with deliverance, O God of our salvation; you are the hope of all the ends of the earth and of the farthest seas. By your strength you established the mountains; you are girded with might. ... <sup>9</sup>You visit the earth and water it, you greatly enrich it; the river of God is full of water; you provide the people with grain, for so you have prepared it. You water its furrows abundantly, settling its ridges, softening it with showers, and blessing its growth. You crown the year with your bounty; your wagon tracks overflow with richness.

**Psalm 104:1-6** Bless the Lord, O my soul. O Lord my God, you are very great. You are clothed with honor and majesty, wrapped in light as with a garment. You stretch out the heavens like a tent, you set the beams of your chambers on the waters, you make the clouds your chariot, you ride on the wings of the wind, you make the winds your messengers, fire and flame your ministers. You set the earth on its foundations, so that it shall never be shaken. You cover it with the deep as with a garment; the waters stood above the mountains.

**Psalm 104:14-21** You cause the grass to grow for the cattle, and plants for people to use, to bring forth food from the earth, and wine to gladden the human heart, oil to make the

face shine, and bread to strengthen the human heart. The trees of the LORD are watered abundantly, the cedars of Lebanon that he planted. In them the birds build their nests; the stork has its home in the fir trees. The high mountains are for the wild goats; the rocks are a refuge for the coneys. You have made the moon to mark the seasons; the sun knows its time for setting. You make darkness, and it is night, when all the animals of the forest come creeping out. The young lions roar for their prey, seeking their food from God.

**Psalm 104:24-30** O Lord, how manifold are your works! In wisdom you have made them all; the earth is full of your creatures. Yonder is the sea, great and wide, creeping things innumerable are there, living things both small and great. There go the ships, and Leviathan that you formed to sport in it. These all look to you to give them their food in due season; when you give to them, they gather it up; when you open your hand, they are filled with good things. When you hide your face, they are dismayed; when you take away their breath, they die and return to their dust. When you send forth your spirit, they are created; and you renew the face of the ground.

**Isaiah 24:3-6** The earth shall be utterly laid waste and utterly despoiled; for the Lord has spoken this word. The earth dries up and withers, the world languishes and withers; the heavens languish together with the earth. The earth lies polluted under its inhabitants; for they have transgressed laws, violated the statutes, broken the everlasting covenant. Therefore a curse devours the earth, and its inhabitants suffer for their guilt; therefore the inhabitants of the earth dwindled, and few people are left.

**Isaiah 35:1-2** The wilderness and the dry land shall be glad, the desert shall rejoice and blossom; like the crocus it shall blossom abundantly, and rejoice with joy and singing. The glory of Lebanon shall be given to it, the majesty of Carmel and Sharon. They shall see the glory of the LORD, the majesty of our God.

**Isaiah 42:5** Thus says God, the LORD, who created the heavens and stretched them out, who spread out the earth and what comes from it, who gives breath to the people upon it and spirit to those who walk in it.

**Isaiah 65:17-18** For I am about to create new heavens and a new earth; the former things shall not be remembered or come to mind. But be glad and rejoice forever in what I am creating.

**Matthew 6:26-29** "Look at the birds of the air, that they do not sow, neither do they reap, nor gather into barns, and *yet* your heavenly Father feeds them. Are you not worth much more than they? And which of you by being anxious can add a single cubit to your life's span? And why are you anxious about clothing? Observe how the lilies of the field grow; they do not toil nor do they spin, yet I say to you that even Solomon in all his glory did not clothe himself like one of these."

Mark 4:37-41 A great windstorm arose, and the waves beat into the boat, so that the boat was already being swamped. But Jesus was in the stern, asleep on the cushion; and they woke him up and said to him, "Teacher, do you not care that we are perishing?" He woke up and rebuked the wind, and said to the sea, "Peace! Be still!" Then the wind ceased, and there was a dead calm. He said to them, "Why are you afraid? Have you still no faith?" And they were

filled with great awe and said to one another, "Who then is this, that even the wind and the sea obey him?"

**John 1:1-5** In the beginning was the Word, and the Word was with God, and the Word was God. He was in the beginning with God. All things came into being through him, and without him not one thing came into being. What has come into being in him was life, and the life was the light of all people. The light shines in the darkness, and the darkness did not overcome it.

**Colossians 1:15-16** Jesus is the image of the invisible God, the firstborn of all creation; for in him all things in heaven and on earth were created, things visible and invisible, whether thrones or dominions or rulers or powers-- all things have been created through him and for him.

**1 Corinthians 8:6** .... yet for us there is one God, the Father, from whom are all things and for whom we exist, and one Lord, Jesus Christ, through whom are all things and through whom we exist.

**Revelation 4:11** "You are worthy, our Lord and God, to receive glory and honor and power, for you created all things, and by your will they existed and were created."

**Revelation 21:1, 5** Then I saw a new heaven and a new earth; for the first heaven and the first earth had passed away, and the sea was no more. ... And the one who was seated on the throne said, "See, I am making all things new."

**Revelation 22:1-2** Then the angel showed me the river of the water of life, bright as crystal, flowing from the throne of God and of the Lamb through the middle of the street of the city. On either side of the river is the tree of life with its twelve kinds of fruit, producing its fruit each month; and the leaves of the tree are for the healing of the nations.

# **Rationale 2 (The Precautionary Principle)**

Effect of some chemicals used in fracking not known; others are carcinogenic:

Bamberger, M. and R. E. Oswald. "Impacts of gas drilling on human and animal health." *New Solutions.* Vol. 22, Iss. 1. 2012 at 51.

Goldstein, Bernard D. et al. "The role of toxicological science in meeting the challenges and opportunities of hydraulic fracturing," *Toxicological Sciences*. Vol. 139, Iss. 2. June 2014 at 279 to 280.

Kassotis, Christopher D. et al. "Estrogen and androgen receptor activities of hydraulic fracturing chemicals and surface and ground water in a drilling-dense region." *Endocrinology*. Vol. 155, Iss. 3. March 2014 at 897, 900.

Shonkoff, Seth B. C. et al. "Environmental public health dimensions of shale and tight gas development." *Environmental Health Perspectives*. Vol. 122, Iss 8. August 2014 at at 788, 789.

U.S. House of Representatives. Committee on Energy and Commerce. [Minority Staff report]. "Chemicals Used in Hydraulic Fracturing." April 2011 at 1 and 8.

# Rationale 3 (Clean Water)

Contamination of water sources such as aquifers:

Banerjee, Neela. "Oil companies fracking into drinking water sources, new research shows." Los Angeles Times. August 12, 2014.

Davies, Richard J. et al. "Oil and gas wells and their integrity: Implications for shale and unconventional resource exploitation." Marine and Petroleum Geology. Vol. 56. September 2014 at 239 to 241, 245 and 251.

Energy Resources Conservation Board. "Caltex Energy Inc. hydraulic fracturing incident 16-27-068-10W6M September 22, 2011: ERCB investigation report." December 20, 2012 at 1.

Finley, Bruce. "Drilling spills reaching Colorado groundwater; state mulls test results." *Denver Post*. December 9, 2012.

Finley, Bruce. "Oil and gas spills surge, two a day, residents often not notified." *Denver Post*. July 29, 2014.

Fontenot, Brian E. et al. "An evaluation of water quality in private drinking water wells near natural gas extraction sites in the Barnett Shale formation." *Environmental Science & Technology.* Vol. 47, Iss. 17. July 15, 2013 at 10032 to 10037.

Lustgarten, Abrahm. "New Study Predicts Frack Fluids Can Migrate to Aquifers Within Years." *ProPublica*. May 1, 2012.

Lustgarten, Abrahm. "Injection wells: the poison beneath us." *ProPublica*. June 21, 2012. Lustgarten, Abrahm. "California halts injection of fracking waste, warning it may be contaminating aquifers." *ProPublica*. July 18, 2014.

Myers, Tom. "Potential contaminant pathways from hydraulically fractured shale to aguifers." *Ground Water*. April 17, 2012 at 872.

Suro, Robert. "Abandoned oil and gas wells become pollution portals." *New York Times.* May 3, 1992.

Urbina, Ian. "A tainted water well, and concern there may be more." *New York Times*. August 3, 2011.

- U.S. Environmental Protection Agency, Underground Injection Control (UIC) Program. "Permitting Guidance for Oil and Gas Hydraulic Fracturing Activities Using Diesel Fuels: Underground Injection Control Program Guidance #84." February 2014 at A–1 to A–4.
- U.S. Government Accountability Office. "EPA Program to Protect Underground Sources From Injection of Fluids Associated With Oil and Gas Production Needs Improvement." GAO-14-555. June 2014 at 51 to 53.

Vengosh, Avner et al. "A critical review of the risks to water resources from unconventional shale gas development and hydraulic fracturing in the United States." *Environmental Science & Technology*. Vol. 48, Iss. 14. August 5, 2014 at 8339.

Warner, Nathaniel R. et al. "Geochemical evidence for possible natural migration of Marcellus Formation brine to shallow aquifers in Pennsylvania." *Proceedings of the National Academy of Sciences.* Vol. 109, Iss. 30. July 9, 2012 at 11965.

Warner, Nathaniel R. et al. "Impacts of shale gas wastewater disposal on water quality in western Pennsylvania." *Environmental Science & Technology.* Vol. 47, Iss. 20. October 15, 2013 at 11849 to 11852.

Wilson, Jessica M. and Jeanne M. Van Briesen. "Source water changes and energy extraction activities in the Monongahela River, 2009–2012." *Environmental Science & Technology*. Vol. 47, Iss. 21. November 5, 2013 at 12575.

### Threats due to issues around drilling:

Brown, David et al. "Understanding exposure from natural gas drilling puts current air standards to the test." *Reviews on Environmental Health*. Preprint, published online March 2014 at 4.

DiGiulio, Dominic C. et al. U.S. EPA. [Draft]. Investigation of Ground Water Contamination Near Pavillion, Wyoming." December 2011 at xiii.

Legere, Laura. "DEP: Oil and gas operations damaged water supplies 209 times since end of '07." *Pittsburgh Post-Gazette*. July 22, 2014.

U.S. House of Representatives. Committee on Energy and Commerce. [Minority Staff report]. "Chemicals Used in Hydraulic Fracturing." April 2011 at 2.

Lustgarten, Abraham. "EPA's abandoned Wyoming fracking study one retreat of many." *ProPublica*. July 3, 2013.

Pennsylvania Department of Environmental Protection. "Consent Order and Settlement Agreement Between the Commonwealth of Pennsylvania. Department of Environmental Protection and Cabot Oil & Gas Corporation." December 15, 2010 at 2.

Vengosh, Avner et al. "A critical review of the risks to water resources from unconventional shale gas development and hydraulic fracturing in the United States." *Environmental Science & Technology*. Vol. 48, Iss. 14. August 5, 2014 at 8334.

#### Effect of spills:

Cano, Regina Garcia. "North Dakota Pipeline Leaked 3 Million Gallons Of Brine In Oil Drilling." *Huffington Post*. March 23, 2015.

Detrow, Scott. "4,700 gallons of acid spill at Bradford County drilling site." *StateImpact Pennsylvania*. July 5, 2012.

Finley, Bruce. "Drilling spills reaching Colorado groundwater; state mulls test results." *Denver Post*. December 9, 2012.

Kusnetz, Nicholas. "North Dakota's oil boom brings damage along with prosperity." *ProPublica.* June 7, 2012.

Magill, Bobby. "Malfunction sends crude oil spraying 850 feet from well near Severance." *Coloradan*. July 22, 2013.

MacPherson, James. "Hiland Crude Pipeline Spills Oil Near Alexander, ND." *Huffington Post*. March 21, 2014.

Passoth, Kim. "Major oil field spill in Kingfisher County: Concern acidic runoff could reach nearby creek, town water system." KOCO (OK). July 30, 2014.

Sontag, Deborah and Robert Gebeloff. "The Downside of the Boom." *New York Times*. November 22, 2014.

Soraghan, Mike. "U.S. well sites in 2012 discharged more than Valdez." *E&E EnergyWire*. July 8, 2013.

Soraghan, Mike. "Many mishaps among drillers, but few fines." *E&E EnergyWire*. July 15, 2013.

Soraghan, Mike. "Spills up 18 percent in U.S. in 2013." E&E EnergyWire. May 12, 2014.

#### Cementing and casing issues lead to leakage into water sources:

Brandt, A. R. et al. "Methane leaks from North American natural gas systems." *Science*. Vol. 343, Iss. 733. February 14, 2014 at 733.

Brandt, A. R. et al. "Supplementary materials for 'Methane leaks from North American natural gas systems'." *Science*. Vol. 343, Iss. 733. February 14, 2014 at 46.

Davies, Richard J. et al. "Oil and gas wells and their integrity: Implications for shale and unconventional resource exploitation." *Marine and Petroleum Geology*. Vol. 56. September 2014 at 243.

Ingraffea, Anthony R. et al. "Assessment and risk analysis of casing and cement impairment in oil and gas wells in Pennsylvania, 2000–2012." *Proceedings of the National Academy of Sciences*. Preprint, published online May 30, 2014 at 2.

### Amount of water used in oil and gas wells:

Hansen, Evan et al. Downstream Strategies and San Jose State University. Prepared for Earthworks Oil & Gas Accountability Project. "Water Resource Reporting and Water Footprint from Marcellus Shale Development in West Virginia and Pennsylvania." October 30, 2013 at 10.

Linn, Anne. [Rapporteur]. (2014). "Development of Unconventional Hydrocarbon Resources in the Appalachian Basin: Workshop Summary." Washington, D.C.: National Academy of Sciences at 5.

Nicot, Jean-Philippe et al. University of Texas at Austin. Jackson School of Geosciences. Prepared for Texas Water Development Board. "Current and Projected Water Use in the Texas Mining and Oil and Gas Industry." June 2011 at 54 and 72.

Scheyder, Ernest. "Insight: The fight for North Dakota's fracking-water market." *Reuters*. May 20, 2013.

### Areas where water is taken regardless of low water levels:

Finley, Bruce. "Colorado farms planning for dry spell losing auction bids for water to fracking projects." *Denver Post*. April 1, 2012.

Freyman, Monika and Ryan Salmon. Ceres. "Hydraulic Fracturing & Water Stress: Growing Competitive Pressures for Water." May 2013.

Nicot, Jean-Philippe, et al. "Source and fate of hydraulic fracturing water in the Barnett shale: A historical perspective." Environmental Science & Technology. Vol. 48, Iss. 4. February 18, 2014 at 2467.

U.S. EPA. "Summary of the Technical Workshop on Water Acquisition Modeling: Assessing Impacts Through Modeling and Other Means, June 4, 2013." September 2013 at A–16.

### Effects on farmers:

- Finley, Bruce. "Colorado farms planning for dry spell losing auction bids for water to fracking projects." *Denver Post*. April 1, 2012.
- Ponce, Zack. "Hurt by drought, NM farmers are selling off water intended for irrigation to oil & gas companies for fracking" *Current-Argus News* (NM). January 29, 2014.
- Scheyder, Ernest. "Insight: The fight for North Dakota's fracking-water market." *Reuters*. May 20, 2013.
- Sontag, Deborah and Robert Gebeloff. "The Downside of the Boom." *New York Times*. November 22, 2014.

### Wastes injected into aquifers and water ways:

Lustgarten, Abrahm. "California halts injection of fracking waste, warning it may be contaminating aquifers." *ProPublica*. July 18, 2014.

Warner, Nathaniel R. et al. "Impacts of shale gas wastewater disposal on water quality in western Pennsylvania." *Environmental Science & Technology*. Vol. 47, Iss. 20. October 15, 2013 at 11849 to 11852.

Whaley, Monte. "98 percent of Colorado in a drought, say CSU climatologists." *Denver Post*. April 3, 2012.

#### Leakage at old and new well sites:

Bruffato, Claudio et al. "From mud to cement – building gas wells." *Oilfield Review*. Autumn 2003 at 63.

Davies, Richard J. et al. "Oil and gas wells and their integrity: Implications for shale and unconventional resource exploitation." *Marine and Petroleum Geology*. Vol. 56. September 2014 at 240, 243, 245, 246 and 247.

Davies, Richard J. et al. "Hydraulic fractures: How far can they go?" *Marine and Petroleum Geology.* Vol. 37, Iss. 1. November 2012 at 1.

Ingraffea, Anthony R. et al. "Assessment and risk analysis of casing and cement impairment in oil and gas wells in Pennsylvania, 2000–2012." Proceedings of the National Academy of Sciences. Preprint, published online May 30, 2014 at 1-2.

Kang, Mary. Princeton University. Department of Civil and Environmental Engineering. [Ph.D dissertation]. "CO<sub>2</sub>, Methane, and Brine Leakage Though Subsurface Pathways: Exploring Modeling, Measurement, and Policy Options." June 2014 at 1.

Kappel, William M. et al. USGS. "Water resources and shale gas/oil production in the Appalachian Basin—Critical issues and evolving developments." Open-File Report 2013–1137. August 15, 2013 at 5.

Kim, Jihoon and George J. Moridis. "Development of the T+M coupled flow-geomechanical simulator to describe fracture propagation and coupled flow-thermal-geomechanical processes in tight/shale gas systems." *Computers & Geosciences*. Vol. 60. October 2013 at 185.

U.S. EPA UIC. February 2014 at A-1 to A-4.

U.S. GAO. "Safeguards Are Not Preventing Contamination From Injected Oil and Gas Wastes." GAO/RCED-89-97. July 1989 at 30 and 31.

Vaidyanathan, Gayathri. "When 2 wells meet, spills can often follow." *E&E EnergyWire*. August 5, 2013;

Vaidyanathan, Gayathri. "Small fortune is lost when oil giant's well collides with family business." *E&E EnergyWire*. October 24, 2013;

Vaidyanathan, Gayathri. "As 'frack hits' grew in Alberta, regulators stepped in." *E&E EnergyWire*. January 7, 2014.

Vengosh, Avner et al. "A critical review of the risks to water resources from unconventional shale gas development and hydraulic fracturing in the United States." *Environmental Science & Technology*. Vol. 48, Iss. 14. August 5, 2014.

Wang, Wei. Louisiana State University. Department of Petroleum Engineering. [PhD dissertation]. "Emergence of Delamination Fractures Around Casing and Its Stability." May 2014 at 112 to 113.

# **Rationale 4 (Increases Global Warming)**

# Effect of global warming on the poor:

Douglas, Ian, Kurshid Alam, Maryanne Maghenda, Yasmin Mcdonnell, Louise Mclean, and Jack Campbell. "Unjust waters: climate change, flooding and the urban poor in Africa." *Environment & Urbanization*. April 2008. vol. 20, no. 1. 187-205.

Mendelson, Robert, Ariel Dinar and Larry Williams. "The distributional impact of climate change on rich and poor countries." *Environment and Development Economics*. April 2006. vol. 2. 159-178

Nuccetelli, Dana. "Climate change could impact the poor much more than previously thought." *The Guardian*. January 26, 2015.

Olsson, L., M. Opondo, P. Tschakert, A. Agrawal, S.H. Eriksen, S. Ma, L.N. Perch, and S.A. Zakieldeen, 2014: "Livelihoods and poverty." In: *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 793-832.

### Effect of Temperature Rise

Leber, Rebecca. "This Is What Our Hellish World Will Look Like After We Hit the Global Warming Tipping Point." *The New Republic*. December 21, 2014.

Potsdam Institute for Climate Impact Research and Climate Analytics. "Turn Down the Heat: Why a 4°C Warmer World Must be Avoided." *A Report for the World Bank*. November 2012.

#### On methane emissions and leaks:

Afsah, Shakeb and Kendyl Salcito. CO<sub>2</sub> Scorecard. "Demand reduction slashes US CO<sub>2</sub> emissions in 2012." May 1, 2013; Renewable Energy Policy Network for the 21st Century (REN21). "Renewables 2014: Global Status Report." 2014 at 27 and 69.

Afsah, Shakeb and Kendyl Salcito. CO<sub>2</sub> Scorecard. "Shale gas: Killing coal without cutting CO<sub>2</sub>." December 2, 2013.

Alvarez, Ramon A. et al. "Greater focus needed on methane leakage from natural gas infrastructure." *Proceedings of the National Academy of Sciences.* Vol. 109, Iss. 17. April 9, 2012 at 6437-6438.

Brandt, A. R. et al. "Methane leaks from North American natural gas systems." *Science*. Vol. 343, Iss. 733. February 14, 2014 at 733.

Brandt, A. R. et al. "Supplementary materials for 'Methane leaks from North American natural gas systems'." Science. Vol. 343, Iss. 733. February 14, 2014 at 29.

Davies, Richard J. et al. "Oil and gas wells and their integrity: Implications for shale and unconventional resource exploitation." *Marine and Petroleum Geology*, Vol. 56. September 2014 at 5.

Edwards, Morgan R. and Jessika E. Trancik. "Climate impacts of energy technologies depend on emissions timing." *Nature Climate Change*. Vol. 4, Iss. 5. April 25, 2014 at 347-348.

Field, Christopher et al. "Technical Summary for Policymakers." In Field, Christopher et al. (2014). Climate Change 2014: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change: Summary for Policymakers. New York: Cambridge University Press at 11 to 20.

Hamburg, Steven. Environmental Defense Fund. "Methane: A Key to Dealing With Carbon Pollution?" November 5, 2013.

Hansen, Evan et al. Downstream Strategies and San Jose State University. Prepared for Earthworks Oil & Gas Accountability Project. "Water Resource Reporting and Water Footprint from Marcellus Shale Development in West Virginia and Pennsylvania." October 30, 2013 at 1.

Hansen, James et al. "Assessing 'dangerous climate change': Required reduction of carbon emissions to protect young people, future generations and nature." PLoS One. Vol. 8, Iss. 12. December 2013 at 13 to 15.

Howarth, Robert W. "A bridge to nowhere: Methane emissions and the greenhouse gas footprint of natural gas." *Energy Science & Engineering*. Preprint, published online May 20, 2014 at Abstract.

Howarth, Robert W., Renee Santoro and Anthony Ingraffea. "Methane and the greenhouse-gas footprint of natural gas from shale formations: A letter." *Climatic Change* (2011) 106:679–690.

Ingraffea, Anthony R. et al. "Assessment and risk analysis of casing and cement impairment in oil and gas wells in Pennsylvania, 2000–2012." *Proceedings of the National Academy of Sciences*. Preprint, published online May 30, 2014 at 2.

Lux Research. [Press release]. "Shale gas drives \$120 billion worth of LNG projects in North America." May 14, 2014.

McKibben, Bill. "Global warming's terrifying new math." *Rolling Stone.* July 19, 2012. Miller, Scot M. et al. "Anthropogenic emissions of methane in the United States." *Proceedings of the National Academy of Sciences.* Vol. 110, Iss. 50. December 10, 2013 at 5.

Myhre, Gunnar et al. "Anthropogenic and Natural Radiative Forcing." In Stocker, T. F. et al. (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. Cambridge and New York: Cambridge University Press at 714.

Myhrvold, Nathan and Ken Caldeira. "Greenhouse gases, climate change and the transition from coal to low-carbon electricity." *Environmental Research Letters.* Vol. 7, Iss. 1. February 2012 at 4 to 5.

Nelder, Chris. "Reframing the transportation debate." *SmartPlanet*. October 19, 2011.

Newell, Richard G. and Daniel Raimi. "Implications of shale gas development for climate change." *Environmental Science & Technology*. Vol. 48, Iss. 15. August 5, 2014 at 8360.

Revkin, Andrew. "U.S. coal exports eroding domestic greenhouse gains." *New York Times.* July 28, 2014.

Roberts, David. "Direct subsidies to fossil fuels are the tip of the (melting) iceberg." *Grist*. October 27, 2011.

Rotty, R. M. and G. Marland. Institute for Energy Analysis. Oak Ridge Associated Universities. Prepared for U.S. DOE. "Production of  $CO_2$  from Fossil Fuel Burning by Fuel Type: 1860-1982." September 1984 at 12 to 14

Schellnhuber, Hans J. et al. German Advisory Council on Global Change. "World in Transition – A Social Contract for Sustainability." 2011 at 112 to 113. U.S. EPA. "Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2010." EPA 430-R-12-001. April 15, 2012 at 2–5; and U.S. EIA. "Natural gas consumption by end use." Available at www.eia.gov/dnav/ng/ng cons sum dcu nus a.htm. Accessed August 13, 2014.

Spratt, David. "The real budgetary emergency & the myth of 'burnable carbon'." *Climate Code Red.* May 22, 2014.

Stockman, Lorne. Oil Change International. "Should It Stay or Should It Go? The Case Against U.S. Crude Oil Exports." October 2013 at 4 and 11.

U.S. EPA. "Inventory of U.S. Greenhouse Gas Emissions and Sinks (GHGI): 1990-2012." EPA 430-R-14-003. April 15, 2014 at 1–9.

U.S. EPA. "Regulatory Impact Analysis for the Proposed Carbon Pollution Guidelines for Existing Power Plants and Emission Standards for Modified and Reconstructed Power Plants." June 2014 at 3–26 and 3–35.

Vaidyanathan, Gayathri. "EPA is underestimating methane emissions from the Barnett Shale – study." ClimateWire. July 8, 2015.

Wigley, Tom M.L. "Coal to gas: The influence of methane leakage." *Climatic Change*. Vol. 108, Iss. 3. August 26, 2011 at 606; IEA. "Golden rules for a golden age of gas." 2012 at 91.

# Rationale 5 (Earthquakes)

Baldacci, Marlena and Mariano Castillo. "Oklahoma quakes this year top tremors in California." *CNN*. June 20, 2014.

British Columbia Oil and Gas Commission. "Investigation of Observed Seismicity in the Horn River Basin." August 2012 at 3.

Ellsworth, William L. "Injection-induced earthquakes." *Science.* Vol. 341, No. 6142. July 12, 2013.

Keranen, Katie M. et al. "Potentially induced earthquakes in Oklahoma, USA: Links between wastewater injection and the 2011 Mw 5.7 earthquake sequence." *Geology*. Vol. 41, Iss. 6. June 2013 at 699 to 702.

Keranen, K. M. et al. "Sharp increase in central Oklahoma seismicity since 2008 induced by massive wastewater injection." *Science*. Vol. 345, No. 6195. July 25, 2014 at 451.

Ohio Department of Natural Resources. [Press release]. "Ohio announces tougher permit conditions for drilling activities near faults and areas of seismic activity." April 11, 2014.

Rosenberg, Mica. "Arkansas lawsuits test fracking wastewater link to quakes." *Reuters*. August 27, 2013.

U.S. Energy Information Administration (EIA). "Annual Energy Outlook (AEO) 2012: With Projections to 2035." DOE/EIA-0383(2012). June 25, 2012 at 93.

van der Elst, Nicholas J. et al. "Enhanced remote earthquake triggering at fluid-injection sites in the Midwestern United States." *Science*. Vol. 341, Iss. 164. July 12, 2013 at 165.

# Rationale 6. (Transport of Oil)

Brown, Matthew and Josh Funk. "AP Exclusive: Fuel-hauling trains could derail at 10 a year." AP News: The Big Story. Feb. 22, 2015.

de Place, Eric. Sightline Institute. "The Northwest's Pipeline on Rails: Crude Oil Shipments Planned for Puget Sound, Grays Harbor, and the Columbia River." May 2014 at 1.

Food and Water Watch. "The Bakken Boom: East Coast At Risk." Fact Sheet, September, 2014.

Horn, Steve. "Exclusive: Permit shows Bakken Shale oil in Casselton train explosion contained high levels of volatile chemicals." *DeSmogBlog*. January 5, 2014.

Krauss, Clifford and Jad Mouawad. "Accidents surge as oil Industry takes the train." *New York Times.* January 25, 2014.

Mapes, Lynda. "Oil train derails in Interbay in Seattle, no spills." *Seattle Times*. July 24, 2014.

Moniz, Ernest. Secretary. U.S. DOE. "Secretary Moniz's keynote at the Sam Nunn Policy Forum in Atlanta, GA – as delivered." April 16, 2014.

Oil Change International. "Runaway Train: The Reckless Expansion of Crude-by-Rail in North America." May 2014 at 6 and 23.

U.S. Department of Transportation (DOT). Pipeline and Hazardous Materials Safety Administration (PHMSA). "Operation Safe Delivery Update." July 23, 2014 at 2 and 16.

Yuen, Laura. "Oil train traffic source of worry in Twin Cities." *Minnesota Public Radio News*. August 11, 2014.

# **Rationale 7. (Creation of More Pollutants)**

Harmful pollutants brought to the surface in fracking process:

Adgate, John L. et al. "Potential public health hazards, exposures and health effects from unconventional natural gas development," *Environmental Science & Technology*, Vol. 48, Iss. 15. August 5, 2014.

Allen, Greg. "Florida county goes to court over 'acid fracking' near Everglades." National Public Radio. July 2, 2014

American Petroleum Institute (API). [Briefing Paper]. "Acidizing: Treatment in Oil and Gas Operators." May, 2014 at 1.

Goldstein, Bernard D. et al. "The role of toxicological science in meeting the challenges and opportunities of hydraulic fracturing," *Toxicological Sciences*. Vol. 139, Iss. 2. June 2014 at 280.

International Atomic Energy Agency (IAEA). "Radiation Protection and the Management of Radioactive Waste in the Oil and Gas Industry." Safety Reports Series, No. 34. November 2003 at 53 to 54.

Redall, Braden. "California senators want more information on oil well 'acid jobs'." *Reuters*. June 18, 2013.

Shonkoff, Seth B. C. et al. "Environmental public health dimensions of shale and tight gas development." *Environmental Health Perspectives.* Vol. 122, Iss 8. August 2014 at 788.

- U.S. EPA. Office of Air and Radiation (OAR). "Regulatory impact Analysis: Final New Source Performance Standards and Amendments to the National Emissions Standards for Hazardous Air Pollutants for the Oil and Natural Gas Industry." April 2012 at 4-24.
- U.S. GAO. "Information on the Quantity, Quality, and Management of Water Produced During Oil and Gas Production." January 9, 2012 at 12.
- U.S. House of Representatives. Committee on Energy and Commerce. [Minority Staff Report]. "Chemicals Used in Hydraulic Fracturing." April, 2011 at 1 and 8.

Vengosh, Avner et al. "A critical review of the risks to water resources from unconventional shale gas development and hydraulic fracturing in the United States." *Environmental Science & Technology*. Vol. 48, Iss. 14. August 5, 2014 at 8338 and 8340 to 8342.

### Impacts on surface water, forests and soil:

Entrekin, Sally et al. "Rapid expansion of natural gas development poses a threat to surface waters." *Frontiers in Ecology and the Environment*. Vol. 9, Iss. 9. October 2011 at 508.

Kassotis, Christopher D. et al. "Estrogen and androgen receptor activities of hydraulic fracturing chemicals and surface and ground water in a drilling-dense region." *Endocrinology*. Vol. 155, Iss. 3. March 2014 at 897.

Linn, Anne. [Rapporteur]. (2014). "Development of Unconventional Hydrocarbon Resources in the Appalachian Basin: Workshop Summary." Washington, DC: National Academy of Sciences at 5.

Musselman, Robert C. and John L. Korfmacher. "Ozone in remote areas of the southern Rocky Mountains." *Atmospheric Environment*. Vol. 82. January 2014 at 383, 384 and 388. Vengosh et al. 2014 at 8339 to 8344.

Sloneker, E. T. et al. USGS. "Landscape consequences of natural gas extraction in Bradford and Washington Counties, Pennsylvania, 2004-2010." Open-File Report 2012-1154. 2012 at 5.

Souther, Sara et al. "Biotic impacts of energy development from shale: Research priorities and knowledge gaps." *Frontiers in Ecology and the Environment*. Vol. 12, Iss. 6. August 2014 at 330, 334.

U.S. EPA. September 2013 at A-16.

Wood, Josh. "Lightning a threat to ND saltwater disposal sites." *Associated Press*. July 19, 2014.

#### Concern over radioactive material:

Banerjee, Neela. "Oil drilling in North Dakota raises concerns about radioactive waste." Los Angeles Times. July 26, 2014.

Donovan, Lauren. "Radioactive dump site found in remote North Dakota town. *Bismarck Tribune*. March 11, 2014.

Ek, Derrick. "Truck carrying well drill cuttings overturns near landfill." *The Leader* (Corning, NY). August 31, 2010.

Heyman, Dan. "Concerns over radioactive waste going into WV landfills." Public News Service. August 4, 2014.

International Atomic Energy Agency (IAEA). "Radiation Protection and the Management of Radioactive Waste in the Oil and Gas Industry." Safety Reports Series, No. 34. November 2003 at 50 to 55 and 69.

Kappel, William M. et al. USGS. "Water resources and shale gas/oil production in the Appalachian Basin—Critical issues and evolving developments." Open-File Report 2013–1137. August 15, 2013 at 5 to 6.

McMahon, Jeff. "Fracking truck sets off radiation alarm at landfill." *Forbes*. April 24, 2013.

North Carolina Departments of Environment and Natural Resources, Commerce, and Justice and RAFI-USA. "North Carolina Oil and Gas Study under Session Law 2011-276." April 2012 at 208.

Smith, Nick. "Dumped filter socks found in Williston." *Bismarck Tribune*. March 12, 2015.

Vengosh, Avner et al. "A critical review of the risks to water resources from unconventional shale gas development and hydraulic fracturing in the United States." *Environmental Science & Technology*. Vol. 48, Iss. 14. August 5, 2014 at 8341 and 8342.

### Inability of wastewater treatment facilities to handle wastewater:

U.S. EPA. Office of Research and Development (ORD). "Study of the Potential Impacts of Hydraulic Fracturing on Drinking Water Resources: Progress Report." EPA 601/R-12/011. December 2012 at 107 to 109.

76 U.S. Fed. Reg. 66286, 66296, 66297. October 26, 2011.

Vengosh et al. 2014 at 8341; Wilson, Jessica M. and Jeanne M. Van Briesen. "Source water changes and energy extraction activities in the Monongahela River, 2009–2012." *Environmental Science & Technology*. Vol. 47, Iss. 21. November 5, 2013 at 12575.

### Methane and other leakage and contamination:

Adgate, John L. et al. "Potential public health hazards, exposures and health effects from unconventional natural gas development," *Environmental Science & Technology*, Vol. 48, Iss. 15. August 5, 2014 at 8308.

Brandt, A. R. et al. "Supplementary materials for 'Methane leaks from North American natural gas systems'." Science. Vol. 343, Iss. 733. February 14, 2014 at 29.

Caulton, Dana R. et al. "Toward a better understanding and quantification of methane emissions from shale gas development." *Proceedings of the National Academy of Sciences*. Vol. 111, Iss. 17. April 29, 2014 at 6238.

Dusseault, M. B. et al. "Why Oil wells Leak: Cement Behavior and Long-Term Consequences." Prepared for presentation at the Society of Petroleum Engineers' International Oil and Gas Conference and Exhibition in Beijing, China. SPE 64733. November 2000 at 1.

Jackson, Robert B. et al. "Increased stray gas abundance in a subset of drinking water wells near Marcellus shale gas extraction." *Proceedings of the National Academy of Sciences*. Vol. 110, Iss. 28. July 9, 2013 at 11250 and 11251.

Karion, Anna et al. "Methane emissions estimate from airborne measurements over a western United States natural gas field." *Geophysical Research Letters.* Vol. 40. August 27, 2013 at 4393.

Osborn, Stephen G. et al. "Methane contamination of drinking water accompanying gaswell drilling and hydraulic fracturing." *Proceedings of the National Academy of Sciences*. Vol. 8, lss. 20. April 14, 2011 at 8173, 8175.

Pétron, Gabrielle et al. "A new look at methane and non-methane hydrocarbon emissions from oil and natural gas operations in the Colorado Denver-Julesburg Basin." *Journal of Geophysical Research: Atmospheres*. Vol. 119, Iss. 11. June 16, 2014 at 6840.

Pétron, Gabrielle et al. "Hydrocarbon emissions characterization in the Colorado Front Range: A pilot study." *Journal of Geophysical Research, Atmospheres*. Vol. 117, Iss. D4. February 21, 2012.

#### Ozone Threat:

Moore, Christopher W. et al. "Air impacts of increased natural gas acquisition, processing, and use: A critical review." *Environmental Science & Technology*. Vol. 48, Iss. 15. August 5, 2014 at 8354.

Musselman, Robert C. and John L. Korfmacher. "Ozone in remote areas of the southern Rocky Mountains." *Atmospheric Environment*. Vol. 82. January 2014at 383, 384 and 388.

U.S. Environmental Protection Agency (EPA). Office of Inspector General (OIG). February 2013 at 2.

#### Silica Dust:

Adgate, John L. et al. "Potential public health hazards, exposures and health effects from unconventional natural gas development," *Environmental Science & Technology*, Vol. 48, Iss. 15. August 5, 2014.

Auch, Ted. FracTracker. "Frac sands mines and related facilities." December 2, 2013.

Esswein, Eric J. et al. "Occupational Exposures to Respirable Crystalline Silica During Hydraulic Fracturing." *Journal of Occupational and Environmental Hygiene*. July 2013 at 347.

Mertens, Richard. "Next fracking controversy: In the Midwest, a storm brews over 'frac sand'." *Christian Science Monitor*. March 9, 2014.

Moore, Christopher W. et al. "Air impacts of increased natural gas acquisition, processing, and use: A critical review." *Environmental Science & Technology*. Vol. 48, Iss. 15. August 5, 2014 at 8353.

National Institute for Occupational Safety and Health. "Hazard Alert: Worker Exposure to Silica during Hydraulic Fracturing." June 2012.

Smathers, Jason. "Sand mining surges in Wisconsin." Wisconsin Watch. July 31, 2011. "Wisconsin school district boosts frac sand air filters." Minnesota Public Radio News. November 3, 2013.

### Combustive release of toxic gases:

Adgate, John L. et al. "Potential public health hazards, exposures and health effects from unconventional natural gas development," *Environmental Science & Technology*, Vol. 48, Iss. 15. August 5, 2014.

Alvarez, Ramon A. et al. "Greater focus needed on methane leakage from natural gas infrastructure." *Proceedings of the National Academy of Sciences.* Vol. 109, Iss. 17. April 9, 2012 at 6437.

Brown, David et al. "Understanding exposure from natural gas drilling puts current air standards to the test." *Reviews on Environmental Health*. Preprint, published online March 2014 at 3.

Hardaway, Ashlie and Matt Belanger. "One fire out, second still burning at Chevron natural gas well blast in Greene County." WTAE.com (Pittsburgh). February 13, 2014.

Litovitz, Aviva et al. "Supplemental data for 'Estimation of regional air-quality damages from Marcellus Shale natural gas extraction in Pennsylvania." *Environmental Research Letters.* Vol. 8, Iss. 1. January-March 2013 at 2.

U.S. Environmental Protection Agency (EPA). Office of Inspector General (OIG). "EPA Needs to Improve Air Emissions Data for the Oil and Natural Gas Production Sector." Report No. 13-P-0161. February 20, 2013 at 2 and 3.

Wood, Josh. "Lightning a threat to ND saltwater disposal sites." Associated Press. July 19, 2014. Gunderson, Dan and Elizabeth Dunbar. "Huge N.D. oil spill burns into second day; weather shift threatens Casselton." Associated Press. December 31, 2013.

# **Rationale 8. (Strain on the Local Community)**

Adgate et al. 2014 at 8314 to 8315; Jacquet, Jeffrey B. "Review of risks to communities from shale energy development." *Environmental Science & Technology*. Vol. 48, Iss. 15. August 5, 2014 at 8321.

American Public Health Association (APHA). "The environmental and occupational health impacts of high-volume hydraulic fracturing of unconventional gas reserves." Policy statement 20125. October 30, 2012.

APHA. [Press release]. "American Public Health Association adopted 12 new policy statements at 140th Annual Meeting." January 3, 2013.

Barth, Janette. "The economic impacts of shale gas development on state and local economies: Benefits, costs, and uncertainties." *New Solutions*. Vol. 23, Iss. 1. 2013 at 86-89, 92-95.

Begos, Kevin. "Expert: Pa. didn't address fracturing health impacts." Associated Press. July 12, 2014.

Brown, David et al. "Understanding exposure from natural gas drilling puts current air standards to the test." *Reviews on Environmental Health*. Preprint, published online March 2014.

Christopherson, Susan and Ned Rightor. "How shale gas extraction affects drilling localities: Lessons for regional and city policy makers." *International Journal of Town and City Management*. Vol. 2. Iss. 4. March 2012 at 2 to 5,10.

Colaneri, Katie. "Former state health employees say they were silenced on drilling." *StateImpact Pennsylvania*. June 19, 2014.

Food & Water Watch. "The Social Costs of Fracking: A Pennsylvania Case Study." September 2013 at 3 to 4 and 7 to 8.

Gold, Russell and Tom McGinty. "Energy boom puts wells in America's backyards." Wall Street Journal. October 25, 2013.

Gopalakrishnan, Sathya and H. Allen Klaiber. "Is the shale energy boom a bust for nearby residents? Evidence from housing values in Pennsylvania." *American Journal of Agricultural Economics*. Vol. 96, Iss. 1. January 2014 at 43.

Jacquet, Jeffrey B. "Review of risks to communities from shale energy development." *Environmental Science & Technology*. Vol. 48, Iss. 15. August 5, 2014 at 8321 to 8333.

Lustgarten, Abrahm and Nicholas Kusnetz. "Science lags as health problems emerge near gas fields." *ProPublica*. September 16, 2011.

Maryland Institute for Applied Environmental Health. July 2014 at xix to xx.

McKenzie, Lisa M. et al. "Birth outcomes and maternal residential proximity to natural gas development in rural Colorado." *Environmental Health Perspectives*. Vol. 122, No. 4. April 2014 at 412.

McKenzie, Lisa M. et al. "Human health risk assessment of air emissions from development of unconventional natural gas resources." *Science of the Total Environment*. Vol. 424. May 1, 2012 at 79.

Pennsylvania Alliance for Clean Air and Water. "List of the harmed." June 8, 2014.

Rumbach, Andrew. Prepared for the Southern Tier Central Regional Planning and Development Board (NY). "Natural Gas Drilling in the Marcellus Shale: Potential Impacts on the Tourism Economy of the Southern Tier." July 2011 at 6, 10 and 19.

Sontag, Deborah and Robert Gebeloff. "The Downside of the Boom." *New York Times*. November 22, 2014.

Steel Valley Printers. "Shalefield Stories; Personal and Collected Testimonies." January 2014.

Steinzor, Nadia et al. "Investigating links between shale gas development and health impacts through a community survey project in Pennsylvania." *New Solutions*. Vol. 23, Iss. 1. 2013 at 55 to 83.

U.S. Department of Housing and Urban Development. "Tackling the Housing Crisis in Pennsylvania's Boomtowns." April 19, 2012.

Vaidyanathan, Gayathri. "Dairy farms on the decline across the Marcellus Shale." *E&E EnergyWire*. March 13, 2012.

Weber, Bret A. et al. "Rural North Dakota's Oil Boom and Its Impact on Social Services." *Social Work*. Vol. 59, Iss. 1. January 19, 2014 at 62-72.

Williamson, Jonathon et al. "Marcellus Natural Gas Development's Effect on Housing in Pennsylvania." Lycoming College, Center for the Study of Community and the Economy. October 31, 2011 at 5 and 17.

# Rationale 9. (Supports Greater Dependence on Fossil Fuels)

Afsah, Shakeb and Kendyl Salcito. CO<sub>2</sub> Scorecard. "Demand reduction slashes US CO<sub>2</sub> emissions in 2012." May 1, 2013. Renewable Energy Policy Network for the 21st Century (REN21). "Renewables 2014: Global Status Report." 2014 at 27 and 69.

Arnsdorf, Isaac. "Fracking sucks money from wind while China eclipses U.S." *Bloomberg News*. May 29, 2014.

Banerjee, Neela, Lisa Song and David Hasemyer. "Exxon's Own Research Confirmed Fossil Fuels' Role in Global Warming Decades Ago," *InsideClimateNews*. Sep 21, 2015.

Banerjee. Neela, Lisa Song and David Hasemyer. "Exxon Believed Deep Dive Into Climate Research Would Protect Its Business." *InsideClimateNews.* Sep 21, 2015.

Biello, David. "Fracking hammers clean energy research." *Scientific American*. March 20, 2014.

Campanale, Mark and Jeremy Leggett/ Carbon Tracker Initiative. "Unburnable Carbon: Are the world's financial markets carrying a carbon bubble?" July 2011 at 2 and 6.

Field, Christopher et al. "Technical Summary for Policymakers." In Field, Christopher et al. (2014). Climate Change 2014: Impacts, Adaptation, and Vulnerability. Contribution of

Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change: Summary for Policymakers. New York: Cambridge University Press at 14.

Hansen, James et al. "Assessing 'dangerous climate change': Required reduction of carbon emissions to protect young people, future generations and nature." *PLoS One*. Vol. 8, Iss. 12. December 2013 at 3.

International Energy Agency (IEA), "World Energy Outlook 2012." 2012 at 259. Simison, Bob. "ExxonMobil Faces Heightened Risk of Climate Litigation, Its Critics Say."

*InsideClimateNews*. September 30, 2015.

Song, Lisa, Neela Banerjee and David Hasemyer. "Exxon Confirmed Global Warming Consensus in 1982 with In-House Climate Models." *InsideClimateNews*. September 22, 2015.

# **Rationale 10 (Moral Obligation of the Church)**

Oil industry's control of government policy:

Aguilar, John and Megan Quinn. "Colorado Oil and Gas Association gives \$600K to fight fracking bans on Front Range ballots." *Daily Camera* (Boulder, CO). October 16, 2013.

Arenschield, Laura. "Halliburton delayed releasing details on fracking chemicals after Monroe County spill." *Columbus Dispatch*. July 22, 2014.

Brown, David et al. "Understanding exposure from natural gas drilling puts current air standards to the test." *Reviews on Environmental Health*. Preprint, published online March 2014 at 4.

Currier, Cora. "ALEC and ExxonMobil push loopholes in fracking chemical disclosure rules." *ProPublica*, April 24, 2012.

Dannenmaier, Eric. "Executive exclusion and the cloistering of the Cheney Energy Task Force." New York University Environmental Law Journal. Vol. 16, Iss. 2. April 2008 at 331.

Diouhy, Jennifer A. "Salazar navigates ethical limits in new role," FuelFix. June 11, 2013.

Greene, Mary. Environmental Integrity Project. "Fracking Beyond the Law: Despite Industry Denials, Investigation Reveals Continued Use of Diesel Fuels in Hydraulic Fracturing." August 13, 2014 at 8.

Holeywell, Ryan. "Former Obama official: Fracking has never been an environmental problem." *FuelFix*. February 5, 2014.

Horn, Steve. "Frackademia: The people & money behind the EDF methane emission study." *DeSmogBlog*. September 16, 2013.

Horn, Steve. "Frackademia' strikes again at USC with 'Powering California' study release." *DeSmogBlog*. March 14, 2014.

Horn, Steve. "Heather Zichal, fomer Obama energy aide, named to board of fracked gas exports giant Cheniere." *DeSmogBlog*. March 14, 2014.

Horn, Steve. "Revealed: Former Energy in Depth Spokesman John Krohn now at U.S. EIA promoting fracking." *DeSmogBlog*: May 23, 2014.

Jacquet, Jeffrey B. "Review of risks to communities from shale energy development." *Environmental Science & Technology*. Vol. 48, Iss. 15. August 5, 2014 at 8322.

Konschnik, Katherine E. et al. Harvard Law School. Environmental Law Program. "Legal fractures in chemical disclosure laws: Why the voluntary chemical disclosure registry FracFocus fails as a regulatory compliance tool." April 23, 2013 at 1.

Lustgarten, Abrahm. "The trillion-gallon loophole: Lax rules for drillers that inject pollutants into the earth." *ProPublica*. September 20, 2012.

Mall, Amy and Dianne Donnelly. Natural Resources Defense Council. "Petition for Rulemaking Pursuant to Section 6974(a) of the Resource Conservation and Recovery Act." September 8, 2010 at 8 to 9.

McIntire, Mike. "Conservative nonprofit acts as a stealth business lobbyist." *New York Times*. April 21, 2012.

Nelder, Chris. "Energy policy: Follow the money." SmartPlanet. August 8, 2012.

Nelder, Chris. "Reframing the transportation debate." *SmartPlanet*. October 19, 2011. Organisation for Economic Co-operation and Development (OECD). (2013) Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels 2013. Paris: OECD Publishing at 429 to 430.

Nolon, Jr.R. and S.E. Gavin. "Hydrofracking: State preemption, local power, and cooperative governance." *Case Western Reserve Law Review.* Vol. 63, Iss. 4. April 29, 2013 at 1001 to 1003.

Public Accountability Inititative (PAI). "Contaminated Inquiry: How a University of Texas Fracking Study Led by a Gas Industry Insider Spun the Facts and Misled the Public." July, 2012.

Public Accountability Inititative (PAI). "Fracking and the Revolving Door in Pennsylvania." February, 2013.

Public Accountability Inititative (PAI). "Industry Partner or Industry Puppet? How MIT's influential study of fracking was authored, funded, and released by oil and gas industry insiders." March 2013.

Rabe, Barry G. "Shale play politics: The intergovernmental odyssey of American shale governance." *Environmental Science & Technology*. Vol. 48, Iss. 15. August 5, 2014 at 8370.

Roberts, David. "Direct subsidies to fossil fuels are the tip of the (melting) iceberg." *Grist*. October 27, 2011.

Sierra Club. "Clean energy under siege: Following the money trail behind the attack on renewable energy." August 2012 at 1 and 6.

Sierra Club and Oil Change International, "Polluting Our Democracy and Our Environment." April 2014 at 2.

Sontag, Deborah and Robert Gebeloff. "The Downside of the Boom." *New York Times*. November 22, 2014.

Sontag, Deborah. "Where Oil and Politics Mix." New York Times. November 23, 2014.

Souther, Sara et al. "Biotic impacts of energy development from shale: Research priorities and knowledge gaps." *Frontiers in Ecology and the Environment*. Vol. 12, Iss. 6. August 2014 at 333.

"The Halliburton Loophole." [Editorial]. New York Times. November 2. 2009.

U.S. Environmental Protection Agency (EPA). Office of Inspector General (OIG). "EPA Needs to Improve Air Emissions Data for the Oil and Natural Gas Production Sector." Report No. 13-P-0161. February 20, 2013 at 3 to 5.

US Government Accountability Office (GAO), "Interior has begun to address Hiring and Retention Challenges but Needs to Do More," GAO-14-205/ January, 2014 at 14.

U.S. EPA Greenhouse Gas Inventory. April 2014 at 3-65 to 3-67.

Warner, Barbara and Jennifer Shapiro. "Fractured, fragmented federalism: A study in fracking regulatory policy." *Publius: The Journal of Federalism*. Vol. 43, Iss. 3. Summer 2013 at 479 to 480.

Weiss, Daniel. "Obama budget drains tax breaks for Big Oil." *ClimateProgress*. April 10, 2013.

### Those calling for a ban or moratorium on fracking:

Food & Water Watch, Fracking Action Center, "Local Actions Against Fracking."

Hansen, Evan et al. Downstream Strategies and San Jose State University. Prepared for Earthworks Oil & Gas Accountability Project. "Water Resource Reporting and Water Footprint from Marcellus Shale Development in West Virginia and Pennsylvania." October 30, 2013 at 18.

Heller, Gernot. "German Environment Agency calls for rules preventing fracking." *Reuters.* July 30, 2014.

"Hermann Scheer (1944-2010): German lawmaker, leading advocate for solar energy and 'hero for the Green Century' in one of his final interviews." Transcript. *Democracy Now!* October 15, 2010.

Jolly, David. "France upholds ban on hydraulic fracturing." *New York Times*. October 22, 2013.

Princen, Thomas. "The Politics of Urgent Transition: Fossil Fuel Exit and the Localization of Attention." In Wolinsky-Nahmias, Yael. (2014). *Changing Climate Politics: U.S. Policies and Civic Society*. Thousand Oaks, California: CQ Press at 225 to 232.

Steingraber, Sandra. "A new environmentalism for an unfractured future." *EcoWatch*. June 6, 2014.