Discussion Case: Hydraulic Fracturing—Can the Environmental Impacts Be Reduced? Hydraulic fracturing—or fracking, as it is sometimes known—has been called the gold rush of the 21st century because so many companies and people are rushing to make their fortunes by extracting oil and natural gas from underground shale formations. What are the environmental impacts of fracking, and what can business, government, and society do to reduce them? In recent years, technology has evolved to make possible the economic extraction of crude oil and natural gas from vast underground shale formations. In hydraulic fracturing, a vertical well is drilled as deep as 7,000 feet before turning horizontally into the oil- or gas-bearing layer. Operators then pump in vast quantities of water, sand, and chemicals under high pressure to break up the shale and release hydrocarbons, which are then brought back up the drill hole. By rotating the horizontal turns in successive passes, a single well can reach a large area underground. The growth of hydraulic fracturing in the United States in recent years has been aston- ishing. In 2014, more than 1 million oil and gas wells were operating in 36 states. The biggest fracking booms were underway in several shale formations: the Baaken (North Dakota), Marcellus (Pennsylvania, West Virginia, New York, Ohio, and Maryland), and Barnett (Texas). Hydraulic fracking has a number of benefits. In 2012, the United States became the leading natural gas producer in the world, overtaking Russia, and is predicted to become the leading oil producer, overtaking Saudi Arabia, within the next few years. At current rates of growth, the United States will be energy self-sufficient by 2030. The fracking boom has created jobs, tax revenue, and royalties to property owners who lease their min- eral rights. Natural gas burns cleaner than either coal or oil, providing a possible bridge to a future economy based on renewable energy. But fracking also carries serious environmental risks. Trucks and heavy equipment cause noise and air pollution in and around drilling sites. The process uses vast quantities of water—at least 250 billion gallons since 2005, according to some estimates—depleting supplies available for drinking and irrigation. Chemicals injected underground include a host of toxins. Fluid that returns to the surface—called flowback—is often further con- taminated by radioactive substances, heavy metals, and volatile organic compounds from deep in the earth. Improper disposal of this wastewater can contaminate land, wells, and rivers—and even cause earthquakes. Methane can be released at multiple stages in the fracking process, powerfully contributing to climate change. Wildlife habitat is destroyed as forests and fields give way to industrial drilling sites. In 2015, the Department of the Interior issued new regulations governing hydraulic fracturing on public and tribal lands. The new regulations required companies to disclose the chemicals they used and set stricter rules for the storage and disposal of wastewater, among other provisions. States, which had jurisdiction over fracking on private and state- owned land, had taken a wide range of approaches. At one extreme, two states—Vermont and New York—had banned fracking outright. In announcing the decision, the health com- missioner of New York said, “The potential risks are too great. In fact, they are not even known.” At the other extreme, government oversight in North Dakota—site of a huge oil boom—was considered highly permissive; in fact, the state’s top environmental regulator described himself on a radio show as “not a regulations guy.” Some states had charted a middle course; California, for example, implemented regulations in 2015 that allowed fracking but required strict monitoring of groundwater and air quality near wells. As the practice of hydraulic fracturing spread, some companies experimented with new technologies to extract oil and gas with less environmental damage. Halliburton developed solar-powered storage silos and natural gas–fueled pumps, reducing on-site emissions. Southwestern Energy installed infrared cameras to detect fugitive methane emissions, so leaks could be plugged. General Electric tested a system that enabled water to be treated and reused on site, and GasFrac, a Canadian company, introduced a fracking method that used no water at all. Said a professor who studied these trends, “[It is] the same as with any industry—if you come out with a game-changing technology, you can get in the market first and ride that.” Sources: “New Federal Rules are Set for Fracking,” The New York Times, March 20, 2015; “Citing Health Risks, Cuomo Bans Fracking in New York State,” The New York Times, December 17, 2014; “The Downside of the Boom,” [series of articles], The New York Times, various dates starting November 22, 2014; “American Power and the Fracking Boom,” October 1, 2014, www.aljazeera.com; “Fracking the USA: New Map Shows 1 Million Oil, Gas Wells,” March 27, 2014, www.climatecentral.org; “Green Fracking? 5 Technologies for Cleaner Shale Energy,” National Geographic, March 21, 2014; Environment America Research and Policy Center, “Fracking by the Numbers: Key Impacts of Dirty Drilling at the State and National Level,” October 2013. Maps showing the distribution of fracking wells in the United States are available online at [www.fractracker.org/map](http://www.fractracker.org/map).

3. Using the classification system presented in this chapter, what type(s) of government regulation has (have) been used to address the concerns you identified in question 1, and which do you think would be most effective? **THIS IS THE QUESTION THAT NEEDS TO BE ANSWERED FOR THE ASSIGNMENT**

1. What is hydraulic fracturing, or fracking, and what are its costs and benefits? **THIS IS THE QUESTION THAT HELPS YOU ANSWER QUESTION #3.**

Core Values

**Responsible Stewardship**

Our Creator blesses us with an abundance of resources. We foster a spirit of service to employ our resources for University and community development. We must be resourceful. We must optimize and apply all of the resources of our community to fulfill Saint Leo University’s mission and goals.