
A LANDOWNER'S GUIDE TO HYDRAULIC FRACTURING

ADDRESSING
ENVIRONMENTAL AND
HEALTH ISSUES IN
OIL AND GAS LEASES



HARVARD LAW SCHOOL
Emmett Environmental
Law & Policy Clinic

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About the Clinic

The Clinic works on a variety of local, national, and international projects covering the spectrum of environmental law and policy issues under the direction of Wendy B. Jacobs, a Clinical Professor at Harvard Law School. This Guide was prepared and revised by Clinic students, including Joshua Herlands (JD '12), Humu-Annie Seini (LLM '11), Zachary Kearns (JD '14), Sarah Peterson (JD '15), and Albert Teng (JD '15), together with the Clinic's lawyers Shaun Goho, Wendy Jacobs, and Aladdine Joroff.

Legal Disclaimer

It is strongly recommended that you consult a lawyer with expertise in oil and gas law before signing a lease or engaging in lease negotiations. This document is not meant to constitute legal advice or legal services, nor is it intended to serve as a substitute for consulting with a lawyer. The Clinic assumes no liability for the actions taken (or not taken) by any party in reliance on this Guide.

Table of Contents

Introduction	1
The Fracking Process	3
How to Use This Guide	5
Environmental and Health Issues	12
1. Acquisition of Baseline Information and Risk Analysis	12
2. Limiting the Location and Scope of the Company's Operations	15
3. Seismic Testing	20
4. Monitoring and Maintenance of Water, Soil, and Air Quality	24
5. Roads.....	28
6. Fencing	32
7. Noise.....	33
8. Development of the Well Site.....	35
9. Drilling and Fracking	37
10. Disposal of Flowback (Wastewater).....	44
11. Extraction of Oil or Gas	49
12. Pipelines	51

13. Compressors.....	54
14. Separators and Dryers	55
15. Injection Wells.....	56
16. Waste Management	58
17. Monitoring the Company's Activities	60
18. Prohibiting Surface Operations	61
General Lease Provisions	63
19. Reclamation and Bonding.....	63
20. Insurance, Indemnification, and Assignments.....	65
21. Violation of Lease Terms and Applicable laws.....	73
22. Non-Disclosure Agreements	74
23. Duration of Lease, Lease Extensions, and Renewals	76

Introduction

With the rapid expansion of oil and gas drilling in the United States, many landowners are now facing the decision whether to grant a lease to a company (“Company”) to allow the extraction of oil or gas from beneath their land. In many parts of the country, this extraction will be carried out by a process commonly referred to as hydraulic fracturing or “fracking.” Fracking involves the injection of a high-pressure mixture of water, sand, and chemicals to create cracks in the shale rock deep underground. This process makes it economically feasible for drillers to extract oil and gas from deep, hard-to-reach locations.

This guide is intended for property owners who are considering whether to sign a lease to allow oil or gas extraction by hydraulic fracturing. Such a lease can present a substantial financial opportunity. Nevertheless, if you are considering entering into a lease, it is important that you realize that fracking is an industrial process that can have a big impact on your property, your family, and your neighbors. When you sign a lease, you (the “Lessor”) are not only agreeing to allow the Company (the “Lessee”) to extract oil and/or gas from below your land, but you are also agreeing to allow the Company to engage in various related activities, such as road construction, drilling, and the storage of large quantities of chemicals and waste products on the surface of your land. Because of the large scale of the operations needed to “frack” a well, as well as the toxicity of the chemicals that are frequently used or emitted to the air, these operations could lead to serious environmental and health risks if not managed properly. As described in additional detail below, these risks can include polluted drinking water, polluted soil, air and noise pollution, land scarring, and increased radon and hydrogen sulfide levels.

One way to limit these impacts is to include protective provisions in your lease and exclude provisions that are detrimental to your interests. For example, a protective lease term to include is a requirement that the Lessee obtain insurance coverage that protects you in the event of an accident. A detrimental lease term to exclude would be a non-disclosure or confidentiality requirement that prohibits you from sharing information about the lease or data collected by you or the Lessee about safety, health, or environmental matters. Including terms that deal with the issues covered by this guide in your lease can be an important way to protect yourself, your family, and your property. Keep in mind, however, that no lease can completely prevent harm; a lease can only require the Company to carry out certain precautionary and mitigating measures and give you legal rights in case things go wrong. Even the best companies can make mistakes, have accidents, or go out of business. And if things do not go according to plan, enforcing the terms of your lease—no matter how favorable or protective—might require a lengthy legal battle, the outcome of which is never certain. So, if you decide to lease your land for fracking, remember that ***it is impossible to eliminate all risk, no matter what terms you include in your lease.***

The Fracking Process

Shale oil and gas drilling and production is a multi-year process involving several distinct stages of operations. The following outline provides a brief overview of the process.

Seismic Testing. If you lease your land, the first thing the Company will do is carry out seismic testing. Such testing involves using special trucks or explosives to send seismic waves into the earth to help the Company determine the location and quantity of the oil and gas.

Site Preparation and Construction. Second, if the Company determines that your property is a good location for a well, it will begin constructing various facilities on your land to enable it to extract the oil and gas. These facilities often include, but are not limited to:

- the well site (where the drilling occurs);
- roads leading to the site;
- pipelines (to carry the oil and gas from the site);
- pits (to store wastewater or other waste);
- fences (to protect facilities and equipment);
- compressors (to compress the gas for transport); and
- separators (to purify the gas for transport).

Well Drilling. Third, the Company will drill the well. Shale formations are typically very deep underground; by way of example, Marcellus shale wells are usually a mile deep. At the bottom of the vertical well, the Company will typically drill horizontally to increase the area from which oil or gas can be extracted by a single well.

Fracking. Fourth, the Company will fracture the shale. The oil and gas in shale formations are too tightly bound to the rock to come to the surface in large quantities from conventional drilling alone. Instead, the Company will pump a mixture of water, sand, and chemical additives into the well at pressures of up to 15,000 pounds per square inch to create cracks, or fractures, in the rock. To frack a single well, the Company might need to use several million gallons of water. Some of this water will return to the surface, along with the chemicals used in the fracking mixture and naturally occurring contaminants. Although this wastewater can be reused, the Company will eventually need to dispose of it. A well can be refracked multiple times.

Extraction. Fifth, the Company will extract the oil and/or gas, a process that can last for years.

Well Plugging and Reclamation. Finally, when the well no longer produces enough oil or gas for the Company to earn profits, the Company will abandon and plug it. In many states, the law requires that this is followed by reclamation (i.e., restoration) of the abandoned site. You will want to ensure that this reclamation restores the site to as close to its original condition as possible.

Each aspect of the drilling and production operations presents environmental or health risks. You may therefore want to incorporate language like the examples provided in the remainder of this guide into your lease to reduce these risks and provide yourself with legal remedies in case something goes wrong.

How to Use this Guide

This guide is intended to be a resource for landowners who are considering whether to enter into a drilling lease. In particular, it:

- highlights some of the key environmental and health risks associated with hydraulic fracturing; and
- provides recommendations for how a landowner can incorporate provisions into a lease to reduce or mitigate those risks.

Sample Lease Provisions. At the end of each section, the guide includes a box with examples of specific lease provisions that are intended to implement these recommendations. As much as possible, these provisions have been based on actual leases and thus contain language that oil and gas companies have agreed to in at least some circumstances. We drew on many resources in drafting these provisions, the most important of which were:

- The leases included in the New York Times's database of more than 110,000 oil and gas leases, available at <http://www.nytimes.com/interactive/2011/12/02/us/oil-and-gas-leases.html>.
- Other leases that various individuals and organizations shared directly with us.
- The performance standards developed by the Center for Sustainable Shale Development, an organization made up of environmental groups such as the Clean Air Task Force and

Environmental Defense Fund as well as industry leaders such as Chevron and Shell.

- The Pennsylvania Environmental Council's *Marcellus Shale Lease Guide*, available at <http://www.pagreenlease.org>.

While the suggested lease provisions in this guide attempt to provide specific language that you can use, you and your attorney should ensure that each provision is adapted to suit your particular needs¹ and is consistent with federal, state, and local laws.

This guide has been prepared with current state and federal laws in mind. Because widespread use of hydraulic fracturing is still a relatively new phenomenon, states are at many different stages in the process of revising their laws and regulations to account for the new and increased impacts it causes. When there are relevant regulations, we have tried to incorporate examples of some states' requirements, both because those examples show what sorts of protections state regulators think are necessary and because, even if a specific requirement does not apply in your state, the Company with which you are dealing may already be accustomed with this standard from its operations elsewhere. It is important to keep in mind, however, that these laws vary from state to state and can also be changed at any time. Thus, before beginning any lease negotiations, you should have your attorney check the most recent versions of the relevant laws and regulations to ensure that your lease conforms to them and includes the most protective language available to you.

¹ To this end, where sample lease provisions call for specific numbers, this guide uses the placeholder “[xx]”—implying that you or your attorney should fill in whatever number is most appropriate to your particular situation.

Negotiating with a Landman. The first draft of a lease that you receive from a Company’s representative—known as a “landman”—will likely contain few, if any, of the provisions suggested below. Remember that the lease the Company gives you is just the *starting point* for negotiations; it has been designed to be as favorable to the Company as possible, and the landman should be prepared to negotiate changes to its terms. The additional terms you negotiate will generally be added as an “Addendum” at the end of the lease. This Addendum should include the following sentence (or something like it), to make sure that the terms of the Addendum govern, rather than any conflicting terms in the Company’s form lease:

If any of the following provisions conflict with or are inconsistent with any of the printed provisions or terms of this Lease, the following provisions shall control.

As mentioned above, the provisions in this Guide are based, to the extent possible, on terms oil and gas companies have agreed to in the past and practices that at least some companies follow. As in any negotiation, however, you should be aware that including protective lease terms might come at a cost: the Company might offer you less favorable financial terms in return for agreeing to include more of the provisions included in this Guide. For example, the Company might agree to carry out extensive mitigation measures to reduce visual and noise pollution, but only if you agree to accept a smaller bonus or royalty in return. You should also be aware that the terms a Company is willing to accept might vary significantly from case to case. The more valuable the oil or gas under your land is to the Company, for example, the more likely it will be willing to include provisions in your favor. Because the Company might not be willing to include all of the terms suggested in this Guide in your lease, as you prepare to negotiate you should think about which terms are most

important to you, how much they are worth to you, and whether there are certain provisions you could live without.

To make a more informed decision, and to put yourself in a better negotiating position, you should also try to find out what kind of terms the Company (or other companies operating in your area) has agreed to in other leases. To do this, start by talking to your neighbors; if a landman is talking to you, he presumably has been, or soon will be, talking to many other people in the area. Consider forming a landowners’ group with your neighbors and negotiating together; this approach will give all of you more bargaining power. Internet discussion forums—online meeting places where landowners can discuss their leases—can provide helpful information as well.

You could also take into account the reputation that the Company has among your neighbors or other landowners. Look into whether the Company has agreed to meet the performance standards adopted by the Center for Sustainable Shale Development (see below). Keep in mind, however, that oil and gas companies frequently sell their leases to each other. We therefore recommend below that you require that the Company get your agreement before transferring the lease to another company.

Another valuable resource is a searchable database of more than 110,000 oil and gas leases that the *New York Times* has made available to the public. You can access the database at this website: <http://www.nytimes.com/interactive/2011/12/02/us/oil-and-gas-leases.html>.

Financial Issues. For the most part, this guide deals only with environmental and health issues. A complete lease will address many other issues, including the length of the lease’s primary term, pooling or unitization, whether you want to receive free gas, and various financial

considerations—such as the royalty rate, whether the royalty is calculated based on the gross or net proceeds from the sale of the oil or gas, and bonus payments. This guide does not address those issues; you can find information about them in some of the resources identified below. You and your attorney will want to negotiate with the Company to secure the best financial terms you can obtain, taking into account the tradeoffs mentioned above.

Mortgages and Property Values. One issue not of a strictly health or environmental nature of which you should be aware relates to mortgages. Some standard lease provisions can violate the terms of Fannie Mae and Freddie Mac’s mortgage documents.² Where relevant, we discuss below particular provisions you should include in your lease to avoid violating the terms of your mortgage. More fundamentally, **if you have a mortgage on your property, in most cases you must get the bank or mortgage servicer’s approval before signing an oil or gas lease.** A Fannie Mae spokeswoman has said that the agency generally “does not approve such requests.”³

A related concern is that some studies have found that the presence of fracking well sites on or near a property reduces the resale value of that property. For example, one study by researchers at Duke University and the think tank Resources for the Future found that shale gas drilling within 1,000 meters of a home decreased property values by an average of 16.7 percent if the home relied on wellwater.⁴ When weighing the financial impacts of signing a drilling lease, you should consider these potential downsides as well as the payments that you will receive.

² See Ian Urbina, *Rush to Drill for Natural Gas Creates Conflicts with Mortgages*, N.Y. TIMES, Oct. 19, 2011.

³ Andy Peters, *Fracking Boom Gives Banks Mortgage Headaches*, AM. BANKER, Nov. 12, 2013.

⁴ Michelle Conlin, *Analysis: U.S. Drilling Boom Leaves Some Homeowners in a Big Hole*, REUTERS, Dec. 12, 2013.

Other Resources. While we hope that this guide will be helpful in providing a concise overview of specific environmental and health risks and ways of mitigating those risks, there are other helpful guides that you may also want to consult. Some particularly useful materials include:

- Pennsylvania Environmental Council, *Marcellus Shale Lease Guide* (2011), available at <http://www.pagreenlease.org/>.
- Earthworks, Oil & Gas Accountability Project, *Oil and Gas at Your Door: A Landowner’s Guide to Oil and Gas Development*, Second Edition (2005), available at <http://www.earthworksaction.org/library/detail/oil-and-gas-at-your-door-2005-edition#.UV760ytYt0K>.
- Center for Sustainable Shale Development, *Performance Standards*, available at <http://sustainableshale.org/>.⁵
- Look Before You Lease Group, *Landowner Toolkit*, <http://lookbeforeyoulease.org/landowner-toolkit/>.
- David McMahon, *Information about Oil and Gas Leasing for Surface Owners Who Also Own Their Minerals* (2008), available at http://www.wyso.org/resources/minerals_royalty/index.html.

⁵ The Center for Sustainable Shale Development, a nonprofit organization, has developed regional performance standards for use in Pennsylvania, Ohio, and West Virginia. The standards are the result of a collaboration between industry leaders, such as Chevron and Shell, and environmental groups, such as the Environmental Defense Fund and the Pennsylvania Environmental Council, and may be voluntarily implemented by companies.

- The extension schools of several land grant universities provide a variety of helpful resources for landowners. See, for example, the materials and programs offered by Ohio State (<http://licking.osu.edu/topics/agriculture-and-natural-resources/marcellus-shale-gas-oil-information>), Penn State (<http://extension.psu.edu/natural-resources/natural-gas>), and Cornell (<http://cce.cornell.edu/EnergyClimateChange/NaturalGasDev/Pages/default.aspx>).

Environmental and Health Issues

The following sections identify either different categories of activities in the shale oil and gas extraction process or different types of impacts. For each category, the section:

- provides a brief description of the relevant activity or impact;
- lists some of the associated health or environmental risks;
- identifies some approaches that leases can take to address these risks; and
- provides examples of lease clauses to implement these approaches.

1. Acquisition of Baseline Information and Risk Analysis

Description of Activity: Before the Company begins its operations, you should obtain “baseline” information about the condition of your land, air, and water. This information will provide a yardstick by which you can monitor impacts of the Company’s activities. Having this baseline information will help deter the Company from neglecting its environmental duties under the lease as well as under applicable laws and regulations. In the event that the Company’s operations harm your property, this baseline information might be the only way you can prove that damage was caused by the Company’s actions. In some states, the Company itself will want to perform baseline water testing, because it will otherwise be presumed to be responsible for groundwater contamination within a certain distance of its activities on your land. In these states, if you refuse a Company’s request to conduct baseline testing, the Company would no

longer be presumed to be responsible for contamination found in the future.

Risks: If you do not have baseline data regarding the condition of your ground and surface water, the air you breathe, the quality of your soil, and the condition of your property, it will be difficult (perhaps impossible) to show later on that the Company's actions have harmed you or your property.⁶

Some states impose certain baseline testing requirements. For example, North Carolina, Ohio, Colorado, Illinois, and Wyoming require baseline water testing of water wells within a certain distance of the wellsite. A recent North Carolina law also requires the acquisition of baseline data regarding air quality near drilling sites, though the regulations implementing this statute have not yet been developed. Even if your state or municipality does require some baseline testing, however, it may not give you sufficient protection. For example, the list of specific substances that must be included in a baseline water test varies from jurisdiction to jurisdiction. It is therefore important that you consult with a qualified attorney before negotiating a lease to determine whether and to what extent baseline testing is required by law in your area.

Potential Lease Terms:

- You can require that the Company hire a qualified, independent environmental engineering or consulting firm to conduct a baseline study—before the Company starts its activities—to ascertain the condition of your soil, water, air,

⁶ If baseline testing indicated existing contamination, you might be required to report that to a state or local agency, and potentially need to clean it up.

roads, livestock, crops, vegetation, buildings, structures, and other properties.⁷

- You can require that the baseline water quality testing look at a minimum set of parameters.
- You can require that the Company give you a written plan of its stage-by-stage activities, the adverse impacts expected, and how each of these impacts will be prevented or mitigated.

Prior to the commencement of any activity under this Lease, Lessee shall perform studies to ascertain the baseline condition of Lessor's property. The baseline information collected shall include, but shall not be limited to: a) an inventory of crops, native or cultivated grasses, trees, pastures, and animals, whether domestic or wild, on the Leased Premises, and b) results of soil, water, and air quality testing. All such testing shall be performed by a certified, independent laboratory of Lessor's choosing. Lessee shall pay all costs of such studies and testing. Lessee shall provide Lessor with complete copies of any and all studies and testing results and data, and Lessor shall have full rights to independently contact the testing laboratory for inquiry, information, data, and test results.

Baseline ground and surface water tests shall sample for at least the following parameters: alkalinity, pH, dissolved organic carbon, barium, boron, calcium, chromium, copper, iron, lead, magnesium, manganese, selenium, sodium, strontium, potassium, arsenic, BTEX compound, chloride, hardness, sulfate, ethane, methane, specific conductance,

⁷ The agency responsible for regulating oil and gas activities in your state may maintain a list of certified consulting firms or laboratories. For a thorough discussion of water quality testing, see *Monitoring Water Quality in Areas of Oil and Natural Gas Development*, prepared by the Colorado Water and Energy Research Center at the University of Colorado, Boulder. The guide is available at: http://cwerc.colorado.edu/docs/cwerc_wellwater_monitoring_guide.pdf.

total dissolved solids (TDS), and total Suspended Solids (TSS).⁸

Lessee shall also provide Lessor with a plan describing each stage of Lessee's proposed activities, identifying the potential effects that said activities will have on all aspects of the Leased Premises, and setting out in detail what steps Lessee will take to prevent and mitigate the potentially adverse effects on the Leased Premises.

2. Limiting the Location and Scope of the Company's Operations

Description of Activity: If you do not limit where the Company conducts its operations, it might choose to locate them on parts of your land that are environmentally sensitive or where you might not want them. Additionally, the Company's operations can interfere with your use of the land as well as that of your neighbors.

Risks: If drilling operations are conducted in certain areas, they could cause ecological damage, ruin areas of your property that have special significance for you, or interfere with your everyday enjoyment of your land. Examples include areas near: your house; livestock; lakes, ponds, or streams; historical sites; and the habitat of endangered species and other wildlife. Additionally, the Company's

⁸ This list is derived from the parameters most frequently required under state baseline water testing laws. See William Cranch, et al., Emmett Environmental Law & Policy Clinic & Harvard Environmental Policy Initiative, *Responding to Landowner Complaints of Water Contamination from Oil and Gas Activity: Best Practices* (2014) http://blogs.law.harvard.edu/environmentallawprogram/files/2014/05/Landowner-Complaints-Water-Contamination_Oil-and-Gas-Activity_FINAL.pdf, as well as the recommendations of the Colorado Water and Energy Research Center, see note 7 above. Depending on the local geology where you live, it might be important to test for other parameters, too.

operations could interfere with other activities on your land, such as farming, fishing, or hunting.⁹

- *Note: You can obtain the help of experts, such as a county soil and water district employee, in identifying sensitive areas where drilling should be avoided.*

Potential Lease Terms:

There are a few basic approaches to limiting the location of the Company's operations on your land. The first is to impose "setbacks," which means that you prohibit the Company from conducting operations within a specified distance from a home, livestock or any other location you specify. For example, a setback of 500 feet from occupied structures means that the Company cannot conduct operations within 500 feet of any such structure on your property, no matter where that structure is located. A second approach is to designate certain areas of your property as "off-limits." For example, if you are worried about protecting a corner of your land that has sentimental value (but is not within 500 feet of an occupied structure), you can specifically prohibit the Company from conducting operations there. Third, instead of using setbacks or designating certain parts of your land as "off-limits," you can designate areas as "on-limits" and limit the Company's activities to those areas only. Finally, you can require that the Company must obtain your approval in writing as to

⁹ It is also important to limit the location of the Company's operations if you have a mortgage on your property or think you might someday want to sell to someone who would need to get a mortgage. In particular, you should specify that the well pad and other equipment be placed at least 300 feet away from any occupied structure. The placement of a well pad within 200 feet of a house is probably inconsistent with section 39.4(i) of Freddie Mac's *Single-Family Seller/Service Guide*. In addition, Federal Housing Authority guidance for appraisers specifies that "No existing dwelling may be located closer than 300 feet from an active or planned drilling site. Note that this applies to the site boundary, not to the actual well site." HUD, *Valuation Analysis for Single Family One- to Four-Unit Dwellings* (4150.2) at 2-2(D). If you have a mortgage on your property, you should consult with your bank or mortgage servicer before signing an oil or gas lease.

the location of any activities before commencing them by providing you with a detailed map to review and approve. In addition:

- You can require that the operations be grouped together to leave the majority of your land free.
- You can require that pre-disturbed land (e.g. farmland) should be used before undisturbed land (e.g. woodlands).
- You can specify that you have the right to build additional structures on your land and/or engage in additional uses of your land.
- You can require that the Company conduct its activities in a manner that will not interfere with your business, recreational, or other uses of the property (such as agriculture, grazing, hunting, fishing, etc.).
- You can prohibit the Company from taking or using any resources (other than oil and gas) on the leased premises without your consent.
- You can prohibit the Company's employees from engaging in non-work related activities, such as hunting or fishing, on your land.
- You can specify that you have the right to the proceeds from the sale of any timber harvested on your land in order to make room for the drilling operations.

Before Lessee commences any operations on the Leased Premises, Lessee and Lessor shall mutually agree in writing on the location of all Seismic Testing Activities, Well Sites, wells, tanks, tank batteries, pits, roads, pipelines, pipes, pump stations, compressors, dryers, separators, gates, and other equipment and facilities so as to avoid disruption of Lessor's use of the Leased Premises. Lessor's consent shall not be unreasonably withheld. In no case shall Lessee locate any equipment, or conduct any operations, within [xx] feet of any structure occupied by humans [or used for agricultural purposes] [or other specified purposes].¹⁰

[and/or]

Lessee shall also, to the degree practicable, design and lay out its operations to be concentrated in a single area of the Leased Premises so as to avoid widespread or unnecessary utilization of surface areas; locate all pipelines and roadways within a single corridor; and conduct operations on pre-disturbed land prior to using undisturbed land.

[and/or]

Lessor reserves the right to construct any structure or other improvements, at any location selected by Lessor,

¹⁰ The minimum setback required by law varies from state to state, and may be measured from a well, well site boundary, and/or specific well operation or equipment to a residence or habitable structure. (Fewer states specify setbacks from agricultural buildings.) In some states setback requirements differ based on whether a well site is in an "urbanized area," disturbs a specified amount of surface area or uses a threshold quantity of water, and can be reduced with the consent of the landowner. Minimum setbacks range from 100 feet (in non-urbanized areas in Ohio) to 300 feet (in New Mexico and less populated areas in Michigan), to 500 feet (in Illinois and Pennsylvania), to 625 feet (for horizontal wells that trigger land disturbance or water use thresholds in West Virginia), to 1,000 feet (in Maryland). Some cities and counties are adopting regulations that require larger setbacks, e.g., 750 feet (in Santa Fe) and 1,500 feet (in Dallas and Flower Mound, a municipality in Texas).

anywhere on the Leased Premises. If Lessor commences construction of a structure or other improvement on the Leased Premises, Lessee will not locate any equipment, nor conduct any operations, within [xx] feet of the proposed structure or improvement without Lessor's written permission.

[and/or]

Lessee hereby agrees that it shall conduct its activities in such a manner that shall not render Lessor or any other person rightfully in close proximity to the site incapable of continuing to enjoy the use of his or her land. Such uses include, but are not limited to [xx]. Lessee will plan and conduct its surface operations in a manner that will avoid or minimize intrusion into or damage of crop fields or grazing areas. In the event such an intrusion cannot be avoided, Lessee shall compensate Lessor for the damage or loss of growing crops or grazing areas at current market value.

[and/or]

Employees, agents, and independent contractors of Lessee shall have no right to and are prohibited from firing any firearms, hunting, fishing, or using off-road vehicles for recreational purposes on the Leased Premises. Lessor has the right to deny access to the Leased Premises to any person found to have violated this provision. Furthermore, Lessor retains the right for Lessor, its successors, assigns, and invitees to fish and hunt anywhere on the Leased Premises.

[and/or]

Lessee shall notify Lessor in writing at least [xx] calendar days prior to any removal of marketable timber (marketability to be within the discretion of Lessor). At Lessor's option, Lessor may choose to harvest timber, or

Lessor may require an appraisal of the timber by a qualified independent appraiser, and Lessee shall pay Lessor the appraised value for the timber identified prior to its removal by Lessee.

3. Seismic Testing

Description of Activity: Before engaging in any drilling or production operations, the Company may perform seismic testing to pick the best places to drill wells. This testing works by sending seismic waves into the earth to determine the makeup of the rock layers, from which the Company may be able to determine where the oil and gas are and how much is there. There are different ways that the Company can generate these seismic waves, including the use of explosives, large "thumper" trucks (trucks that pound the ground in various spots to generate seismic waves) or "vibroiseis" trucks (trucks that vibrate the ground to generate seismic waves). Explosives are less common in current operations, but they are still sometimes used.

Risks: If the Company uses explosives, the resulting holes can cause erosion and/or pollution of adjacent ponds, streams, and wells. Thumper and vibroseis trucks avoid these problems, but can create additional visual, noise, and air pollution while they are in use. The vibrations from these trucks can also damage walls if they are used too close to a building. In addition, because thumper and vibroseis trucks are so large, the Company will likely need to clear roadways for them to operate, and they are unsuitable for steep or thickly vegetated terrain. If the Company uses truck-mounted equipment in conjunction with explosives, you get the worst of both worlds: heavy trucks and holes. In order to seismically test hard-to-reach, roadless, or other sensitive areas, Companies can deliver explosive seismic testing equipment using helicopters. The use of helicopters creates visual, noise,

and air pollution, but in certain terrain may have less of an impact on the ground than trucks.

Potential Lease Provisions:

- You can specify that the Company use thumper trucks, vibroseis trucks, or explosives in conjunction with trucks or helicopters, depending on the unique features of your land. For example, if your land is flat and open, you may find that thumper or vibroseis trucks are the least disruptive option. On the other hand, if your land is thick with trees you prefer to keep standing, you can require the Company to fly in explosive equipment via helicopter in order to avoid having to clear enough land for the trucks to operate.
- If you do not prohibit the use of explosives during seismic testing, you can require that the Company minimize erosion by not conducting seismic testing during periods of wet weather.
- You can require that the Company plug all “shot holes” caused by explosives from bottom to top when it has finished seismic testing activities.
- You can require that the Company limit its seismic testing period to a specific number of weeks and/or time of day and to give you 24 hours’ notice before conducting any seismic testing.
- You can specify that the Company must compensate you for any damage its seismic activities cause and require the Company to provide financial assurance, such as a bond, for such work.¹¹ *(Note: The issue of financial*

¹¹ Several states, such as Colorado and Wyoming, require financial assurances related specifically to costs arising from seismic-testing, such as plugging shot holes and surface reclamation.

assurances is addressed further below in the section on reclamation and bonding.)

- As with all activities, you can limit the location of the Company’s seismic activities by using setbacks, designating certain areas as on- or off-limits, and/or requiring the Company to obtain your approval of the location of specific activities. *(Note: This issue is covered by the lease language provided in the section above on limiting the location and scope of the Company’s activities.)*

[If you prefer the Company to use vibroseis or thumper trucks]:

Lessee shall use *[choose vibroseis or thumper trucks]* in conducting its Seismic Testing Activities. Without Lessor’s separate written consent, Lessee shall not use explosives during these activities. Lessee shall compensate Lessor for any damage resulting from Lessee’s Seismic Testing Activities.

The duration of Seismic Testing Activities shall not exceed *[xx]* weeks. Lessee shall provide Lessor with advance notice at least 24 hours before conducting any Seismic Testing Activities.

For the purposes of this Lease, Seismic Testing Activities shall include all activities undertaken by Lessee for the purpose of gathering information regarding the subsurface geology of and/or natural resources located on or beneath the Leased Premises and/or adjacent lands.

[In the event that you do not prohibit the use of explosives during seismic testing]:

Lessee shall not conduct Seismic Testing Activities during periods of wet weather, such as rain or snow. Any holes in

the ground resulting from Lessee's seismic testing shall be plugged, from bottom to top, by Lessee within [xx] days from the date on which the hole was shot. Lessee shall plug and abandon these holes in a manner that prevents vertical movement of water in the hole. Lessee shall compensate Lessor for any damage resulting from Lessee's Seismic Testing Activities.

The duration of Seismic Testing Activities shall not exceed [xx] weeks. Lessee shall provide Lessor with advance notice at least 24 hours before conducting any Seismic Testing Activities.

For the purposes of this Lease, Seismic Testing Activities shall include all activities undertaken by Lessee for the purpose of gathering information regarding the subsurface geology of and/or natural resources located on or beneath the Leased Premises and/or adjacent lands.

[If you prefer the Company to use helicopters instead of trucks]:

In the course of its Seismic Testing Activities, Lessee shall use only existing roads. To the extent that Seismic Testing Operations require Lessee to travel off existing roads on the Leased Premises, Lessee shall deliver equipment via helicopter.

Risks: If the Company uses wire survey flags to mark land as part of its seismic testing process, farm equipment (such as tractors) can shred the flags, producing metal bits that can kill livestock grazing on the land. Additionally, if the Company uses seismic lines to mark land, these lines can destroy vegetation and could cause erosion.

Potential Lease Provisions:

- You can require that the Company minimize its use of seismic lines.
- You can require that seismic survey stakes be made of wood instead of metal.
- As with all activities, you can require that the Company remove all materials when the process is finished.

Throughout its Seismic Testing Activities, Lessee shall minimize the use of physical markers, including, but not limited to, seismic lines, survey flags, and stakes. To the extent that Lessee utilizes survey flags in its seismic testing activities, Lessee shall refrain from using flags or flag stands made of metal. Within [xx] days from the date on which the Lessee has completed its Seismic Testing Activities, Lessee shall remove all materials used in such Seismic Testing Activities, including all physical markers, as well as any refuse or other equipment that may have been left behind by Lessee.

4. Monitoring and Maintenance of Water, Soil, and Air Quality

Description of Activity: Various aspects of the Company's operations can lead to contamination of well water, ponds, streams, or other water sources on your land. These operations can also contaminate your soil and/or pollute your air.

Risks: Water and air contamination are extremely serious and can be dangerous to your health and the health of the people, plants, and animals around your property. In addition, if your water were to become contaminated, it would reduce the value of your property. Finally, soil

contamination and air pollution can also lead to increased health hazards to you, your family, and your livestock and reduced property values.

Potential Lease Terms:

- You can require that the Company conduct periodic tests to detect any changes in the smell, color, taste, or quality of your water and provide the test results to you.
- If the testing reveals any negative change to your water sources compared to the baseline, you can require that the Company take steps to remedy the problem.
- You can also require that the Company conduct periodic tests of the quality of your soil and air and provide those test results to you.
- For soil and air testing, you can designate locations that the Company should include in its monitoring plans and specific events that require testing. Locations of interest might include the site of the drilling activity, the location of a particular piece of equipment, your residence or other structures, property boundaries, grazing or crop areas, or environmentally sensitive areas.
- You can specify that you have the right to share any test results with other people, such as your doctor or your neighbors.¹²

¹² The Company might try to include a non-disclosure or confidentiality clause. As discussed below, you should not agree to such a clause. At a minimum, you can make it clear that such a clause does not apply to testing results.

- You can require that the Company put non-toxic “tracers” (unique chemical fingerprints) in their fracking fluids. If these tracers later appear in your wellwater, they would prove that water contamination was caused by the Company’s operations.¹³

Lessee shall maintain or improve the baseline quality and quantity of all water sources on the Leased Premises, including, but not limited to, streams, ponds, lakes, springs, aquifers, and wells. To this end, in addition to the required studies and testing that take place prior to operations, Lessee shall also test all water sources on the Leased Premises at least every [xx] months during operations, at the completion of operations, and every [xx] months for at least one year after the completion of operations.¹⁴ Lessee shall also test all water sources on the Leased Premises as deemed necessary by Lessor in Lessor’s sole discretion due to changes in flow or quality, including but not limited to color, smell, or taste. This testing shall be performed by an independent company of Lessor’s choosing that is certified by an appropriate state or federal agency. Lessee shall pay all costs of testing and shall provide Lessor with complete copies of any and all testing results and data. Lessor shall have full rights to independently contact the testing laboratory for inquiry and information (including data and test results) and shall have the right to share with any public or private third party any and all such testing

¹³ Tracers are molecules such as synthetic DNA or “nano-rust” that are safe and similar to naturally occurring substances. Their use is still a relatively new practice, but is required under the Dallas, Texas, gas drilling ordinance.

¹⁴ Many states do not require that operators perform follow-up water quality tests. Even those that do mandate such tests may require them only for a short time after well completion. North Carolina recently amended its oil and gas laws to require five follow-up tests instead of two, and may provide a model to be used in setting the testing intervals for your lease. The tests must occur “at six months, 12 months, 18 months, and 24 months after production has commenced and a test within 30 days after completion of production activities at the site.”

results. Any contamination of the water on the Leased Premises after any operations commence will be presumed to be the result of Lessee's operations unless Lessee can prove otherwise, with Lessee having the burden of proof by a preponderance of the evidence.

Should any water sources be compromised, contaminated, degraded, tainted, chemically altered, infiltrated, polluted, or reduced as a result of Lessee's operations, Lessee shall promptly take any and all steps necessary to restore water quality and quantity to its baseline condition. During the period of such remediation, Lessee shall provide Lessor with an adequate supply of potable water consistent with the baseline condition of the water source prior to Lessee's operation. Any pollution or reduction of any water source after any operations commence will be presumed to be the result of Lessee's operations unless Lessee can prove otherwise, with Lessee having the burden of proof by a preponderance of the evidence. Until Lessee can prove otherwise as to cause, Lessee shall provide the required replacement supply beginning immediately upon Lessor's providing evidence to Lessee of the water quality and/or quantity condition causing concern.

Lessee shall maintain or improve the baseline soil quality and air quality on the Leased Premises. To this end, in addition to the required studies and testing that take place prior to operations, Lessee shall also conduct air quality and soil quality testing on the Leased Premises at least every [xx] months during operations, including at times when the following equipment is operating at peak capacity [xx], at the completion of operations, and every [xx] months for at least one year after the completion of operations. The location of such tests shall include, but not be limited to: [xx]. Lessee shall also conduct air quality and soil quality testing as deemed necessary by Lessor in Lessor's sole discretion. This testing shall be performed by an independent company of Lessor's choosing that is certified by an appropriate state or federal agency. Any

pollution of the air or soil on the Leased Premises after any operations commence will be presumed to be the result of Lessee's operations unless Lessee can prove otherwise, with Lessee having the burden of proof by a preponderance of the evidence. Lessee shall pay all costs of testing and of remediating any contamination to restore the soil and air to their pre-lease, baseline condition. Lessor shall be provided complete copies of any and all testing results and data, and shall have full rights to independently contact the testing laboratory for inquiry and information. Lessor shall have the right to share with any public or private third party any and all testing results (including data and test results). In the event that, during the term of this Lease, any government agency having jurisdiction over the Leased Premises develops a plan for testing or other analysis of water, soil, and/or air quality that involves formation of a fund for specific or random tests of water quality in areas subject to oil and gas exploration, including the Leased Premises, Lessee agrees to participate in such a plan to the same extent as if that plan had been in existence at the time of inception of this Lease.

[If you decide to require the use of tracers]:

Lessee shall add non-radioactive tracing or tagging additives into all fracturing fluids used on the Leased Premises. The non-radioactive tracing or tagging additives must be unique and not used on any other site. Lessee shall provide Lessor with the formula identifying the nonradioactive tracing or tagging additives in writing.

5. Roads

Description of Activity: Fracking and related oil and gas extraction activities can generate significant truck traffic. The Company will need to transport large amounts of water, chemicals, and supplies to and from the well site. To support its operations, therefore, a Company might

widen existing roads and/or build new roads to access various parts of its work sites. A Company may also wish to build roads where you prefer they not be built, such as close to your house or through a crop field.

Risks: Roads create additional “scars” on the land and can lead to more traffic if other people decide to use the new or improved road. Roads and traffic can interfere with your daily life and activities, and result in continuous noise and dust pollution. In addition, improperly built or maintained roads can lead to erosion and soil or water pollution.

Potential Lease Terms:

- You can limit the Company’s ability to widen existing roads and/or build new roads.

Note: You should check with the local fire department, county engineer, and/or planning commission to determine that the road will be constructed with sufficient turnaround space for emergency vehicles.¹⁵

- You can reserve the right to use any new roads created by the Company on the Leased Premises.
- You can also require that the Company install and maintain a gate on any new road it builds to help limit access by other people who might seek to use it.
- You can limit the location of roads by using setbacks, designating certain areas as on- or off-limits, and/or requiring the Company to obtain

¹⁵ For example, Ohio state regulations require that, “[w]here the access road is in excess of one hundred fifty feet in length, turnaround areas shall be located as practical based on the existing site conditions.”

your approval for the location of roads, especially avoiding areas that are environmentally sensitive. *(Note: This issue is covered by the lease language provided in the section above on limiting the location and scope of the Company’s activities.)*

- If dirt roads are involved, you can have the Company periodically use non-polluting dust suppression techniques, the easiest of which is spraying water on the road.
- You can require that all of the Company’s employees drive slowly on the roads.
- You can prohibit the Company from using the roads at certain times of the day or year, such as early in the morning and/or late at night, and/or on weekends and holidays.
- You can require that the Company maintain any new roads it builds after well plugging and reclamation is complete if there are ongoing monitoring requirements that require access via the new roads.

Lessee agrees to locate and grade not more than one (1) road to each major work area necessary for its operations and to confine travel to such road. Any road constructed by Lessee shall not exceed [xx] feet in width, or a minimum width required to perform required operations. Any road constructed by Lessee shall be constructed such that there is sufficient turnaround space for emergency vehicles. Lessor shall have the right to use any road constructed by Lessee.

At Lessor’s request, Lessee shall install and diligently maintain fences, gates, closures, and/or cattle guards on all roads built by Lessee. Lessor will be allowed free use thereof. At Lessor’s request, such fences, gates, closures,

and cattle guards will become Lessor's property on termination of this Lease. At Lessor's request, Lessee shall keep all gates closed when not in use.

To the extent permitted by applicable law, Lessee agrees to improve and maintain all roads used by it in good repair. These duties apply to all roads utilized by Lessee, regardless of whether Lessee constructed such road. For public roads, Lessee shall maintain such roads in conformity with standards set forth by the relevant permitting authority to provide a smooth, rut-free, all-weather surface suitable for use by automobiles. For private roads, Lessee shall utilize shale, gravel, or crushed stone where necessary to provide a smooth, rut-free, all-weather surface suitable for use by automobiles. When such private roads are no longer being used by Lessee, Lessee agrees, upon Lessor's request, to: (i) continue to maintain the roads after well plugging and reclamation if necessary to provide access for any required ongoing monitoring activity; and/or (ii) restore the surface as nearly as possible to its baseline condition. When improving, constructing, or maintaining roads, Lessee shall not use any materials from the Leased Premises without the written consent of the Lessor.

At Lessor's request, Lessee shall control dust from traffic to the maximum extent practicable, utilizing water or, with Lessor's approval, another harmless or benign substance as a dust suppressant when necessary. Unless otherwise authorized by Lessor, Lessee shall use fresh water not obtained from the Leased Premises.

Lessee shall be responsible for any and all operation of vehicles by its employees, agents, and contractors. Driving speeds shall not exceed [xx] miles per hour on the Leased Premises. Unless emergency conditions dictate or Lessee has received prior written consent from Lessor, Lessee shall prevent its employees, agents, and contractors from traveling and operating any vehicle on the Leased

Premises between: [xx] o'clock PM and [xx] o'clock AM, as well as on [xx].

6. Fencing

Description of Activity: The Company's operations will include many activities that, for safety reasons, it will be important to keep enclosed. This is frequently achieved through fencing, which is especially important to keep children, livestock, wildlife, and unauthorized persons from getting too close to certain structures and equipment that could be harmful to them.

Risks: Inadequate fencing can leave dangerous activities exposed to inadvertent access. If fencing is used, it may prevent necessary access to the fenced in areas by you or emergency personnel.

How to Protect Yourself:

- + You can require that the Company use fences around all of its operations and grant you reasonable access to those areas.

At Lessor's request, Lessee shall (i) fence all wells and well sites, tank batteries, pits, and other equipment placed on the Leased Premises with a fence no less than [xx] feet high that is capable of deterring livestock, wildlife, small children, and trespassers; (ii) keep such fences in good repair; and (iii) keep all gates and fences closed at all times. Lessor shall be allowed all reasonable access to fenced areas and Lessee shall ensure that emergency personnel can access the fenced areas if required.

7. Noise

Description of Issue: The operation and movement of heavy machinery and equipment associated with well site development may be noisy.

Risks: This noise could cause nuisance and stress for you, your family, your neighbors, and any livestock, wildlife, or pets in the vicinity.¹⁶

Potential Lease Provisions:

- You can require that the Company limit noise-producing activities to specific times of day. For example, you can prohibit such activity when people are asleep early in the morning and/or late at night, and/or on weekends and holidays.¹⁷
- You can require that the Company mitigate noise through: (i) equipment-based measures, such as mufflers or electric motors in place of gas or diesel engines; and/or (ii) design measures, such as planting trees, building berms, or using other types of sound barriers.¹⁸

¹⁶ In some instances, companies involved in oil and gas production have asked landowners to sign permanent “noise and nuisance easements,” which—presumably in exchange for a payment—give the company the right to impose “noise, dust, light, smoke, odors, fumes, soot or other air pollution, vibrations, adverse impacts or other conditions or nuisances which may emanate from or be caused by [the company’s] operations” on the landowner. Entering such an agreement would substantially decrease a landowner’s ability to seek mitigation of or compensation for noise or other listed nuisances. See Mike Lee, *Drillers Use Novel “Nuisance Easement” to Address Well Site Criticisms*, Energy Wire, June 5, 2014, available at <http://www.eenews.net/energywire/stories/1060000764>.

¹⁷ In some jurisdictions, such as Dallas, Flower Mound, and Santa Fe, certain well development activities are limited to daytime hours.

¹⁸ Noise mitigation requirements in some states and locales distinguish between urban, residential, agricultural, rural, or other areas. For example: (i) quiet design mufflers are required for non-electric operated motors and

- You can also require that the Company’s operations do not generate noise in excess of a certain decibel level, including levels lower than those that might be required by the state, county or municipality in which you are located. You should agree with the Company where noise measurements will be made, *e.g.*, at the well-site or at a residence, etc.

Noise levels associated with Lessee’s operations on the Leased Premises shall be kept to a reasonable minimum.

[and/or]

Whenever possible, Lessee shall utilize electric-powered equipment in its operations. If Lessee utilizes any non-electric-powered equipment in its operations, Lessee shall utilize mufflers and take other reasonable steps to muffle the sound therefrom, including, after consultation with Lessor, the planting of trees or construction of berms or enclosures or screening around wells and well sites, tank batteries, pits, and other equipment placed on the Leased Premises.

[and/or]

Lessee shall not operate any vehicles, equipment, or machinery on the Leased Premises between: [xx] PM and [xx] AM, as well as on [xx].

[and/or]

engines within 400 feet of a building in a rural, agricultural or residential area in Colorado; (ii) 30 foot noise reduction blankets are required for wells within 2,000 feet of a protected use in Dallas; and (iii) sound-absorbent enclosures and mufflers are required for compressors with over 150 horsepower in Michigan. You can choose to require mitigation features like screening and mufflers regardless of the type of area in which you are located, and you can make these measures mandatory in your lease.

Lessee shall minimize the impact of rig, compressor, generator, and operational noise. At any given time, Lessee's operations shall not generate noise in excess of [xx] decibels, on average over the course of any [xx] minute period, nor [xx] decibels at any one time, as measured from any point within [xx] feet from the activity generating the sound.

8. Development of the Well Site

Description of Activity: Once the Company determines where to drill its well(s), it will begin preparing the well site(s) for drilling operations. This process involves stripping the land of vegetation and putting in place drilling and production equipment such as the well pad, drill rig, tank battery, compressors, and water tanks. It also involves building access roads so that trucks can reach the well site(s).

Risks: Developing the well site(s) can leave an ugly "scar" on the land if the Company does not engage in proper reclamation and re-vegetation. If the Company spreads out its operations and the location of equipment, then more land will be impacted.

Potential Lease Provisions:

- You can require that all infrastructure (e.g., well pads, compressor stations, condensate tanks) be located as close together as possible, in as small an area as possible.
- You can make the Company engage in "interim reclamation," i.e. planting trees and other vegetation near the well in order to minimize the eyesore, stabilize soil, and help reduce the noise associated with ongoing drilling and production operations.

- You can require that the Company design the well pad to minimize the risk that hazardous substances, drilling fluids, and/or waste come into contact with ground or surface waters.
- As with all activities, you can limit the location of the well site by using setbacks, designating certain areas as on- or off-limits, and/or requiring the Company to obtain your approval of the well site location.¹⁹ (Note: This issue is covered by the lease language provided in the section above on limiting the location and scope of the Company's activities.)

Lessee shall use its best efforts to minimize the size of the Well Site and locate equipment and infrastructure as close together as possible.

Following the construction of the Well Site, and prior to Lessee engaging in any drilling or production operations, Lessee shall consult with Lessor and take steps to minimize the visual impact associated with the Well Site. At Lessor's request, and to the extent that it does not present an increased fire hazard, Lessee shall take reasonable efforts to plant trees and other vegetation in areas that help minimize the visual impact of the well site. Both parties recognize that said vegetation shall be limited to that which does not interfere with Lessee's ability to conduct its operations. Well Site construction is deemed to have been completed when the Well Site has been constructed such that it is able to be used for its primary purpose.

Lessee shall design each well pad to minimize the risk that hazardous substances, drilling fluids and/or waste come into contact with ground or surface waters. In particular,

¹⁹ As indicated in footnote 9, above, the placement of a well pad within 300 feet of a dwelling raises serious concerns if you have a mortgage or ever attempt to sell your land to someone who would need to obtain a mortgage.

Lessee shall construct a berm around the well pad to prevent runoff and install an impervious liner under the entire well pad, underlain with composite decking to prevent punctures in the liner.

For the purposes of this Lease, the Well Site shall refer to the area that includes a well drilled on the Leased Premises and the associated facilities that are appurtenant to the operation of said well for the purpose of aiding in the processes of extraction and recovery, lifting, stabilization, treatment, separation, production processing, storage, and measurement of oil, hydrocarbon gas and/or liquids.

9. Drilling and Fracking

Description of Activity: Once the equipment is in place, the Company will begin drilling the well. First, the Company will drill vertically for thousands of feet. Once the well reaches the layer of shale that contains the oil or gas, the Company will change the direction of its drilling and drill horizontally into the shale. Next, the Company will engage in the actual “fracking” of the shale to extract the oil or gas trapped within. This is done by shooting water, chemicals, and additives down the well hole at high pressures to create fractures in the shale. This mixture is commonly referred to as “frackwater” or “slickwater.” When the mixture comes back up from the well, it is often referred to as “flowback,” “wastewater,” or “produced water.” This flowback carries with it additional compounds that are picked up from inside the well. Some of these compounds, although occurring naturally (e.g., arsenic), may pose health or environmental hazards when brought to the surface.

Risks – Hazardous Substances: Companies may use hazardous substances in several phases of their operations. These hazardous substances could be very harmful to you, your family, animals, and/or your property

by polluting water, air, and land.²⁰ In particular, the drilling and fracking processes requires the use of many different chemicals, and can lead to the contamination of water sources such as ponds, streams, and wells and could thus be harmful to health. The drilling process can also release and carry to the surface naturally occurring substances, like arsenic or mercury, and radioactive material (often referred to as “NORM”) such as radon, all of which can be harmful to health.

How to Protect Yourself:

- You can require that the Company provide you with notice before it starts drilling.
- There is conflicting information regarding whether it is possible to frack without using hazardous substances. Some companies, however, have started to promote fracking fluids that they claim are non-toxic and contain no hazardous substances. You should therefore attempt to prohibit the use of hazardous substances in your lease. As a practical matter, however, know that you cannot prohibit the presence of hazardous substances on your property because some naturally-occurring hazardous substances come to the surface during the fracking process.

²⁰ In addition, standard mortgage documents prohibit “the presence, use, disposal, storage, or release of any Hazardous Substances” on the mortgaged property. If you have a mortgage on your property, you should consult with your bank or mortgage servicer before signing an oil or gas drilling lease.

Lessee shall provide at least [xx] calendar days prior written notice to Lessor before Lessee commences any actual drilling on the Leased Premises.

Lessee shall not use fracturing fluids on the Leased Premises that contain any “hazardous substances,” “hazardous materials” or “toxic substances” as defined in federal, state, or local statutes, regulations, or ordinances. In no event shall Lessee use diesel fuel, benzene or other petroleum-based chemicals in its hydraulic fracturing fluids.

- Regardless of whether you prohibit the use of hazardous substances in fracking fluid, you should ensure that the Company provides you with the names of, and information about, all chemicals used in its fracking fluid and any other hazardous substances present on your property.²¹ You can also prohibit it from using certain substances.
- You can reserve the right to share the information the Company provides you about chemicals in its fracking fluid with medical or veterinary professionals for purposes of diagnosis or treatment, or in case of emergency.²²
- You can require that the Company not store chemicals on your property, or require that they be kept in a particular area at a safe distance from your home, crops, livestock, and water sources.

²¹ A number of states now require companies to disclose the chemicals used in fracking fluids. Others, however, have not adopted such a disclosure requirement. Even in those states that do require disclosure, some allow companies to limit disclosure to protect trade secrets.

²² Even when companies assert trade secret protection for chemical information, some states, including Arkansas, Colorado, Ohio, Pennsylvania, and Texas, explicitly provide that such information must nonetheless be shared with medical personnel.

- You can require that the Company pay for periodic testing for hydrogen sulfide and radioactive materials in and around occupied structures.

Note: Lease provisions regarding other types of testing, such as water and soil, are included above in the sections covering acquisition of baseline information and maintenance of water quality.

Prior to using or generating any substance defined as “hazardous substances,” “hazardous materials,” “toxic substances,” or “solid wastes” in federal, state, or local statutes, regulations, or ordinances, and prior to injecting any substance whatsoever into a well drilled on or underneath the Leased Premises, Lessee shall provide Lessor with: a list of all substances—broken down by compound and including the name under which the product is sold, the vendor, and a description of the substance’s purpose—that are to be used, generated, or injected; Material Safety Data Sheets for each substance; the Chemical Abstracts Service registry number of each substance; and a description of the type and total volume of base fluid, proppant, and chemical additives to be used, generated or injected. Lessor shall have the right to share such information with medical or veterinary personnel for purposes of diagnosis or treatment, or in case of emergency.²³

Lessee shall not store chemicals on the Leased Premises, except to the extent necessary to carry out contemporaneous use of such chemicals in operations. Any chemicals necessary to carry out contemporaneous uses on the Leased Premises shall be stored a minimum of

²³ Watch out for provisions elsewhere in the lease that restrict your ability to share information received from the Company. Any confidentiality, nondisclosure or related clause in the lease should be amended to reflect that the restriction on sharing information does not apply where human or animal health and safety are at issue.

[xx] feet from any occupied structure, growing crop, livestock, or potable or non-potable water source on the Leased Premises.

At Lessor's request, Lessee shall pay for testing for hydrogen sulfide and radioactive materials, to occur once every [xx] months, of any occupied structures on the Leased Premises, whether constructed before or after the effective date of this Lease. Such test results shall promptly be provided to Lessor. This testing shall be performed by an independent company of Lessor's choosing that is properly licensed to conduct such testing. Testing shall also be conducted prior to and at the completion of operations on the Leased Premises or on any land in the unit of which any of the Leased Premises is a part.

Should any hazardous substance or solid waste be accidentally released on the Leased Premises, Lessee shall immediately notify Lessor and the applicable governmental body of such event, and shall take all action necessary to mitigate harm and clean up, remediate, and restore all affected areas.

Risks – Water Use: Fracking fluid uses a tremendous amount of water—sometimes up to several million gallons each time a well is fracked—and wells can be fracked multiple times. If local water sources are used by the Company, the fracking process can deplete the water in your wells, streams, or ponds. In addition, the more water that the Company uses, the more wastewater that it must eventually dispose.

How to Protect Yourself:

- You can require that the Company bring all water for its operations from off site.

Note: One potential downside to this approach is that it will mean more trucks driving to and from the well site.

- You can require that the Company use a “closed loop” system that recycles the liquid used during the drilling process.

Without Lessor's prior written consent, Lessee shall not use surface or groundwater from the Leased Premises, including Lessor's springs, ponds, wells, creeks, streams, rivers, or lakes for any operations undertaken by Lessee. This restriction shall not apply in the event of a fire or similar emergency.

Without Lessor's prior written consent, Lessee shall not drill or operate any water well, take water, or otherwise use or affect water in subsurface water formations underlying the Leased Premises. Any water well drilled by Lessee on the Leased Premises, with Lessor's written consent, shall be left intact and shall become the property of Lessor upon the termination of this Lease. To the extent applicable, Lessee shall assist in transferring any permit, license, or other approval regarding the existence or operation of such wells to Lessor.

Lessor shall use a closed-loop system for drilling or reworking operations on the Leased Premises.

Risks – Air Pollution: To drill a well, the Company must use powerful drilling equipment. Emissions from this equipment can contribute to air pollution that may harm you and your family. In addition to this source of air pollution, once the Company has drilled and fracked a well, it must clear the wellbore of the fracking fluid and other debris; during this process, a significant amount of gas will come to the surface as well. Whether the Company allows this gas to escape into the air (a process known as venting)

or burns it off (a process known as flaring), the result may be serious air pollution caused by methane and volatile organic compounds (smog precursors commonly referred to as VOCs).

How to Protect Yourself:

- You can require that the Company use electric- or gas-powered equipment whenever possible. If the Company must use diesel engines, you can require that these engines meet certain emissions standards. The emissions standards suggested below are derived from the Center for Sustainable Shale Development's Performance Standard No. 11.
- You can mandate "green completions," a practice whereby the Company captures gas during the well completion phase, which reduces air pollution—and, because green completions mean that gas is being captured and sold instead of wasted, it means more royalties in your pocket too. Many companies already use green completions and EPA has mandated that all companies follow this practice for gas wells by 2015.

Whenever possible, Lessee shall utilize electric- or gas-powered equipment in its operations. If Lessee utilizes any non-electric- or natural gas-powered equipment, Lessee shall use nonroad diesel engines on the Leased Premises only if such engines achieve horse power-hour weighted average site emissions equivalent—at a minimum—to U.S. EPA Tier 4 emissions standards for particulate matter or any more stringent standard issued by EPA or the state. All such equipment must use Ultra-Low Sulfur Diesel fuel (15 ppm or less of sulfur) at all times.

If the fracturing pump is powered by a dedicated diesel heavy-duty vehicle engine, such engine must at a minimum meet U.S. EPA's Final Emission Standards for 2007 and Later Model Year Highway Heavy-Duty Vehicles and Engines for particulate matter (PM) emissions, or any more stringent standard issued by EPA or the state. These engines must use Ultra-Low Sulfur Diesel fuel (15 ppm or less of sulfur) at all times.

Lessee shall capture for sale or use all gas during the completion phase, using green completion technology. In no event shall Lessee vent or flare gas during the completion phase.

10. Disposal of Flowback (Wastewater)

Description of Activity: After the well has been fracked, a portion of the wastewater returns to the surface where it will be stored for re-use or discarded. This flowback is usually contaminated. There are various methods of temporarily storing flowback, most notably in large open-air impoundment pits or several closed tanks usually grouped in batteries. Additionally, companies sometimes try to dispose of flowback by spraying or misting it out of an open-air impoundment pit, or by spreading it on dirt roads. In some cases, companies try to pipe flowback

between well locations so that it can be managed at a central location. Centralized impoundment pits are thus larger than pits serving single wells.

Risks: If the Company uses an impoundment pit to store flowback, it will dig a large pit on your property, which can leave a scar on the land and result in leakage of contaminated flowback.²⁴

How to Protect Yourself:

- You can prohibit the use of impoundment pits and require that flowback be stored temporarily in a tank, trucked away, and properly disposed of by the Company.

Note: One potential short-term downside to this approach is that it will mean more trucks driving to and from the well site. This nuisance may be considered less dangerous than the problems an impoundment pit presents.

Without Lessor's prior written consent, Lessee shall not dig any pits on the Leased Premises for the storage of flowback, produced water, wastewater, brine, saltwater, or frackwater ("Flowback"). Lessee shall remove all Flowback from the Leased Premises and dispose of it off-site in conformity with applicable law.

²⁴ For properties with mortgages, another reason to avoid impoundment pits is that standard mortgage documents prohibit "the presence, use, disposal, storage, or release of any Hazardous Substances" on the mortgaged property. In addition, Federal Housing Authority guidance for appraisers provides that properties with "slush pits" for drilling mud are ineligible for FHA mortgage insurance. HUD, *Valuation Analysis for Single Family One- to Four-Unit Dwellings* (4150.2) at 2-2(E). If you have a mortgage on your property, you should consult with your bank or mortgage servicer before signing a gas lease.

Risks: If an impoundment pit is used for temporary storage, it can present a hazard for children, livestock, and wildlife. Evaporating flowback can create air pollution and foul odors in the surrounding area. Additionally, if there is a tear in the pit liner, (or no liner), the contaminated wastewater can seep into the ground and contaminate soil and water sources.

How to Protect Yourself:

- If you decide to allow the Company to build an impoundment pit, you can ensure that the Company builds it in accordance with best industry practices, including that it be adequately lined, monitored and fenced to keep out livestock and children.

Note: This fencing provision is covered by the lease language provided in the section above on fencing.

- You can prohibit the Company from spraying wastewater into the air or onto the ground to aid in its evaporation or disposal.
- You can require that the Company treat the wastewater on-site to mitigate the pollution and foul odors associated with it.
- As with all activities, you can limit the location of pits by using setbacks, designating certain areas as on- or off-limits, and/or requiring the Company to obtain your approval of the location of pits, especially avoiding areas that are environmentally sensitive.

Note: The last issue is covered by the lease language provided in the section above on limiting the location and scope of the Company's activities.

Any pit agreed upon by Lessor and Lessee shall conform to all applicable regulatory requirements and be deep enough to allow at least [xx] inches of backfill over the liner after grading to the surrounding pre-drill contour. Any such pit shall be double-lined and equipped with leak detection equipment. Lessee shall ensure that free hydrocarbons are removed from the water prior to storage. Promptly after completion of operations, any Flowback, backfill and liners shall be removed, and the pits shall be prepared for burial, back filled, graded, and planted within [xx] days, weather permitting. Soil and water testing shall be conducted before and after pit closure. If contamination is encountered, it shall be the responsibility of the Lessee to remediate to achieve pre-lease, baseline conditions.

Lessee shall immediately notify Lessor and the appropriate government agencies if any pit lining is torn, punctured, or otherwise breached or if any contamination is detected by testing.

Lessee shall not employ any methods that actively aid in the evaporative process of any Flowback stored in a pit on the Leased Premises. This prohibition includes spraying, misting, dispersing, or otherwise actively aiding in the evaporation of such Flowback into the surrounding environment by any means whatsoever.

At Lessor's request, Lessee shall use reasonable means to periodically treat the Flowback temporarily stored in a pit on the Leased Premises so as to minimize any odors emanating from it.

Risks: If the Company pipes wastewater to a different location, the wastewater can contaminate local water sources, such as wells, streams, and ponds, if the piping leaks and/or ruptures.

How to Protect Yourself:

- You can require that the Company refrain from piping wastewater across your land.

Note: One potential downside to this approach is that it will mean more trucks driving to and from the well site.

- If you do allow the Company to pipe wastewater, you can require that the Company inspect the piping regularly, and immediately notify you of any leaks and repairs.
- As with all activities, you can limit the location of wastewater pipes by using setbacks, designating certain areas as on- or off-limits, and/or requiring the Company to obtain your approval of the location of wastewater pipes, especially avoiding areas that are environmentally sensitive.

Note: The last issue is covered by the lease language provided in the section above on limiting the location and scope of the Company's activities.

Without Lessor's prior written consent, Lessee shall not utilize any piping to transport Flowback over or under any part of the Leased Premises.

In the event that Lessee utilizes piping to transport Flowback, Lessee shall visually inspect the length of such piping regularly, with such inspections occurring no less frequently than once every [xx] days. In the event that any portion of the piping is damaged or leaking, Lessee shall a) immediately notify Lessor and the appropriate local, state and/or federal authority, b) cease utilizing the piping until it is repaired, c) undertake all cleanup efforts necessary to fully remediate any resulting contamination to restore

baseline conditions, and d) monitor any soil, ground water or surface water impacted by, or in the vicinity of, any damaged or leaking piping for at least [xx] months after the piping is repaired to ensure that there is no ongoing contamination.

11. Extraction of Oil or Gas

Description of Activity: As a result of the hydraulic fracturing of the shale or other rock, oil and gas flow up through the well and are captured for transport, processing, and sale.

Risks: Oil and gas are highly flammable and their extraction creates a risk of fires at the well site and during transport. In areas where the natural gas pipeline infrastructure is inadequate, such as the Bakken Shale region of North Dakota, much of the natural gas from wells that primarily produce oil is flared off.

How to Protect Yourself:

- In addition to the primary fire prevention techniques required by law, you can require that the Company build dikes and/or firewalls around the well site and associated equipment to prevent the spread of substances that could increase the risk of fire.
- You can also require that the Company have the ability to disable the well remotely if necessary.
- In the event of a fire emergency, you can require that the Company take reasonable steps to protect your home or other structures on the Leased Premises from fire damage.

- As with all activities, you can limit the location of the extraction of oil and gas by using setbacks, designating certain areas as on- or off-limits, and/or requiring the Company to obtain your approval of the location of extraction activities, especially avoiding areas that are inhabited, used by livestock, or are environmentally sensitive. Because flaring of gas from oil-producing wells can be prevented only when there are natural gas pipelines with available capacity nearby or by stopping oil production, if you are in an area where flaring will occur, you should take into account the additional air pollution from flaring when deciding on the size of the setbacks.

Note: The last issue is covered by the lease language provided in the section above on limiting the location and scope of the Company's activities.

Lessee must construct and maintain at all times dikes, berms, firewalls, or other methods of secondary containment around the Well Site, including around all tanks and other receptacles, so as to contain a volume of liquid equal to at least [xx] times the total volume of such tanks and other receptacles located within the boundaries of the firewall, dike, or berm.

Lessee shall have remote capability to cease all activity at the well site and to close the well in the event that such emergency cessation of activities is necessary.

In the event of a fire, Lessee shall take all reasonable steps to protect residential buildings and other structures on the Leased Premises, provided that Lessee shall not be required to undertake any action that imposes a safety threat to any individuals.

12. Pipelines

Description of Activity: To carry gas from the well to market, the Company will need to build pipelines that connect the well to the larger network of pipelines around the country. To transport oil, the Company may either build pipelines or use tanker trucks.

Risks: Above-ground pipelines are an eyesore. Buried pipelines require excavation and leave a “scar” on the land. Additionally, buried pipelines could be ruptured during any future construction activities. Loading tanker trucks may result in spills.

How to Protect Yourself:

- You can require that any pipelines that the Company builds are not interstate pipelines (which are larger than the typical “gathering lines” used locally).
- You can specify that the Company is not allowed to transport or store oil or gas that has not been extracted from your land (“foreign gas” or “foreign oil”) across or on your land.
- You can require that pipelines be limited in their usage and not be used beyond the life of the well.
- If you are concerned about the pipeline being an eyesore or otherwise interfering with the use of your land, you can require that the Company bury all pipelines to a specific depth (for example, beneath plow depth).
- You can require “interim reclamation” for any area affected by either above-ground or buried pipelines.

- As with all activities, you can you can limit the location of pipelines or roads used by tanker trucks by using setbacks, designating certain areas as on- or off-limits, and/or requiring the Company to obtain your approval of the location of pipelines, especially avoiding areas that are environmentally sensitive, or areas where you might want to build something in the future, and perhaps utilizing areas that are already developed, such as near and parallel to roads.

Note: The last issue is covered by the lease language provided in the section above on limiting the location and scope of the Company’s activities as well as in the section on roads.

Lessee shall have the right to construct pipelines that are necessary for its operations. Lessee shall provide at least [xx] calendar days prior written notice to Lessor before Lessee commences construction of pipelines on the Leased Premises. Unless otherwise agreed to in advance in writing by Lessor, all pipelines shall be less than [xx] inches in diameter and shall not be designed or used for interstate transmission. No pipeline on the leased premises shall be used to transport foreign gas or oil on, over, across, under, or through the Leased Premises without a separate easement from Lessor or applicable unitization agreement. Lessee shall use its best efforts to locate all pipelines near and parallel to preexisting or planned roads. Lessee shall reimburse Lessor for reasonable damages caused by the construction and operation of pipelines.

The right to build and/or operate pipelines on the Leased Premises may not be assigned to a utility company, pipeline company, or anyone else who owns no interest in the Leased Premises or is not otherwise contracted or affiliated with Lessee for the purpose of carrying out the rights and obligations under this Lease. The right to use

said pipelines terminates when production from the Leased Premises ceases and all wells associated therewith are plugged and abandoned.

[If you would like the pipeline to be buried]:

Lessee shall bury any and all pipelines that it constructs on the Leased Premises to a minimum depth of [xx] below ground level.²⁵ Lessee shall use the double ditch method when laying or constructing pipelines. Unless otherwise agreed to in writing by Lessor, the width of the graded underground line corridor shall not exceed [xx] feet. If Lessee constructs buried pipelines on the Leased Premises, Lessor shall have the right to construct and lay drainage and other utility pipes, wires, and lines across or under Lessee pipelines in a manner which does not interfere with the use thereof.

Within [xx] days from the date on which pipeline construction has been completed, weather permitting, Lessee shall engage in interim reclamation of the surface disturbance caused by the pipeline. Pipeline construction is deemed to have been completed when the pipeline has been constructed such that it is able to be used for its primary purpose. As part of this interim reclamation, Lessee shall grade all areas as nearly as practicable to the baseline contours following applicable state regulations and Best Management Practices (“BMPs”), and spread set aside topsoil evenly to its original depth. Lessee shall purchase seeds of Lessor’s choice that meet state and local regulations and BMPs and plant them in graded areas. Lessee shall pay for all damage to growing crops, fences, tiles, and other appurtenances to the Leased Premises caused by construction and operation of pipelines.

²⁵ State law often requires pipelines to be buried at a minimum depth; if you would like them to be buried deeper than that, you should specify that in the lease.

13. Compressors

Description of Activity: Before piping fracked gas long distances, the Company will compress it to allow for more efficient transport. This will involve the use of a compressor station at some point in the process. Note that there does not need to be a compressor station at every well site.

Risks: Compressor stations run on engines and can be very loud. Additionally, compressors contribute to local air pollution and may add to respiratory problems for you and your family.

Potential Lease Provisions:

- Given that it is not necessary that every well site has a compressor station, you can prohibit the Company from putting a compressor on your land.
- If you decide to allow a compressor, you can require that the Company erect noise barriers to reduce the noise pollution from the Compressor.

Note: This issue is covered by the lease language provided in the section above on Noise.

- If you decide to allow a compressor, you can require that the Company comply with certain emissions standards.

Note: This issue is covered by the lease language provided in the section above on air pollution in connection with Drilling and Fracking.

- You can require that any tests of air quality conducted by the Company include tests when compressors are operating at their maximum capacity; the location for such tests could be at the

compressor, at your residence, or such other location as you designate.

Note: This issue is covered by the lease language provided in the section above on monitoring and maintaining water, soil, and air quality.

- As with all activities, you can limit the location of compressor stations by using setbacks, designating certain areas as on- or off-limits, and/or requiring the Company to obtain your approval of the location of compressors, especially avoiding areas that are environmentally sensitive.

Note: The last issue is covered by the lease language provided in the section above on limiting the location and scope of the Company's activities.

Without a separate written agreement, no pump stations or compressors shall be located on the Leased Premises.

14. Separators and Dryers

Description of Activity: Before sending the fracked gas through interstate pipelines, the Company will use a separator to purify it. As with compressor stations, there does not need to be a separator at every well site.

Risks: Separators can release harmful contaminants into the air such as hydrogen sulfide, benzene, and volatile organic compounds (sometimes called "VOCs"). Additionally, the separation process produces wastewater that must be properly managed and disposed.

How to Protect Yourself:

- Given that it is not necessary that every well site has a separator, you can prohibit the Company from putting a separator on your land.
- You can require that any tests of air quality conducted by the Company include tests when separators or dryers are operating at their maximum capacity; the location for such tests could be at the equipment, at your residence, or such other location as you designate.

Note: This issue is covered by the lease language provided in the section above on monitoring and maintaining water, soil, and air quality.

- As with all activities, you can limit the location of separators and dryers by using setbacks, designating certain areas as on- or off-limits, and/or requiring the Company to obtain your approval of the location of separators and dryers, especially avoiding areas that are environmentally sensitive.

Note: This issue is covered by the lease language provided in the section above on limiting the location and scope of the Company's activities.

Without a separate written agreement, no dryers or separators shall be located on the Leased Premises.

15. Injection Wells

Description of Activity: After a well no longer produces enough oil or gas for the Company to profit by extracting it, the Company will often seek to reuse the well for the purpose of either (a) storing oil or gas or (b) storing or

disposing of flowback (wastewater). This process involves injecting oil or gas or wastewater back into the well (hence the well is often referred to as an “injection well” or a “disposal well”).

Risks: Allowing a well to be reused in the future as an injection well increases the potential that the substances injected into the well will contaminate soil, groundwater, and nearby wells, ponds, and streams.²⁶ In addition, recent reports suggest that injection wells have caused earthquakes, including the largest recorded earthquake in Oklahoma history, a magnitude 5.7 quake that damaged several homes.²⁷

Potential Lease Provisions:

- You can expressly prohibit gas wells from being used as injection wells in the future.
- If you do decide to allow the Company to use a well as an injection well in the future, you can require that this be covered by a separate agreement that specifies the exact conditions according to which injection must take place.

²⁶ For properties with mortgages, another reason to avoid injection or disposal wells is that standard mortgage documents prohibit “the presence, use, disposal, storage, or release of any Hazardous Substances” on the mortgaged property.

²⁷ See Molly Hennessy-Fiske, *Oklahoma Earthquakes Linked to Injection Wells*, L.A. TIMES, Mar. 27, 2013, available at <http://www.latimes.com/news/nation/nationnow/la-na-nn-oklahoma-qaues-fracking-20130327,0,7788391.story>; see also Mike Lee, *Ohio Pushes Other Oil-Producing States on Seismic Rules*, ENERGY WIRE, May 21, 2014, available at <http://www.eenews.net/energywire/2014/05/21/stories/1059999965> (noting Ohio’s restrictions on wastewater wells associated with oil and gas operations because of earthquake activity).

Without a separate written agreement, Lessee is prohibited from using any well drilled on the Leased Premises as a “disposal” or “injection” well. Pursuant to this prohibition, Lessee shall not use the Leased Premises for the permanent disposal of any drill cuttings, or the storage or disposal of Flowback or other wastes resulting from the Company’s use of the Leased Premises. No disposal wells or any other devices or means of disposal of Flowback or other wastes resulting from the Company’s use of the Leased Premises are permitted on the Leased Premises. Lessee shall have no right to use the Leased Premises or any portion thereof, surface or subsurface, for gas, oil, or Flowback storage purposes.

16. Waste Management

Description of Activity: The Company’s activities will generate not only wastewater, but also solid waste and debris, some of which will be hauled off, but some of which could end up on your land temporarily or even permanently.

Risks: If not properly managed and disposed of, this waste (liquid and solid) and/or debris can create an eyesore and could potentially pollute your land. If waste or debris remains on your property for a certain amount of time, the property could be considered a waste storage facility that requires additional local, state and/or federal approvals, reporting, monitoring, and the like. This is especially a concern if the waste includes hazardous substances.

How to Protect Yourself:

- You can require that the Company properly dispose of all waste and debris within a certain period of time.

- You can specifically prohibit the Company from burying any waste on your property.
- You can require that the Company keep the property and equipment clean at all times.
- If any waste or debris is stored on the property, you can require that the Company be responsible for obtaining any necessary local, state and/or federal approvals and complying with any applicable house-keeping, monitoring, reporting, or other obligations, including after the Company has concluded its activities at the Leased Premises.

Lessee shall at all times keep the Leased Premises clean and free of debris, litter, and waste (whether liquid, solid, or gaseous).

Lessee shall not bury any materials, including, but not limited to, drill cuttings, Flowback, or any other wastes, on the Leased Premises.

Lessee shall keep all tanks and other equipment at each well location in good repair, painted, and shall keep the well site and all roads leading thereto free of weeds and debris. Unless there is agreement otherwise, Lessee shall remove all waste and debris (i.e. material not originally from or of the Leased Premises, or material no longer in its original condition), in whatever form or state, from the Leased Premises, within [xx] days of the termination of this Lease or of the cessation of construction, production, or operations on the Leased Premises, whichever may occur sooner.

To the extent the presence of waste or debris on the Leased Premises requires any local, state, or federal approval, or triggers any maintenance, monitoring,

reporting, or other obligations, the Company shall be responsible for obtaining such approvals and complying with such obligations, including after termination of this Lease or the cessation of construction, production, or operations on the Leased Premises.

17. Monitoring the Company's Activities

Description of Activity: You want to be able to monitor the Company's activities throughout its operations.

Risks: Without the ability to monitor the Company's activities, there is no way to ensure that it is complying with its obligations under the lease and under applicable laws and regulations.

How to Protect Yourself:

- You can require that the Company grant you access to its operations, including the well site, any impoundment pits, and other areas leased by the Company, so that you can monitor compliance with lease terms and applicable laws and regulations.
- You can also require that the Company provide you with copies of its permits, plans, reports, and other relevant documents to ensure general compliance with applicable laws and regulations.

Lessee shall at all times grant Lessor reasonable access to its operations on the Leased Premises for the purposes of determining compliance with the terms and provisions of this Lease and applicable laws and regulations.

Upon Lessor's written request, Lessee shall furnish Lessor copies of all permits, plans, and other relevant documents

required under any applicable law for the operations to be conducted on the Leased Premises.

Lessee shall promptly notify Lessor upon receipt by Lessee of any notice of noncompliance, governmental enforcement action, judicial proceeding, and/or threat thereof brought to the attention of Lessee relating to its use or operation of the Leased Premises as well as copies of all filings, statements, and reports made by Lessee, or others with regard to Lessee or its operations, with any government agency pertinent to drilling, completing, and equipping wells.

18. Prohibiting Surface Operations

Description of Activity: If the Company is planning to drill on neighboring land or another nearby property, it might be able to extract the oil or gas from under your land without conducting any surface operations (with the possible exception of seismic testing activities) on your property. By leasing only the right to drill and extract oil or gas from underneath your land, but not to conduct any operations on the surface, you can avoid some of the problems discussed above. These so-called “No Surface Use” leases are quite common in certain parts of the country.

After you sign a “No Surface Use” lease, the Company may later ask you to authorize surface operations, pursuant to a separate “Surface Use Agreement.” In that event, you should consider negotiating into that separate agreement the types of provisions suggested in this Guide.

How to Protect Yourself:

- You can require that the Company not conduct any surface operations.
- In the event that you permit the Company to perform seismic testing on your land, confer with your lawyer about including the terms discussed above in the section on Seismic Testing Activities.

Lessor gives consent for the wellbore to pass through or terminate beneath the surface of the Leased Premises. Lessee shall not drill any well, enter upon or make any installation of any nature on the surface of the Leased Premises. Lessee, however, may conduct seismic testing activities on and below the surface of the Leased Premises, provided that such activities do not unreasonably interfere with Lessor’s use and enjoyment of the property, and that Lessee complies with the following conditions: [*insert appropriate Seismic Testing Activities provisions*].

General Lease Provisions

In addition to lease provisions designed to address the specific environmental and health issues identified above, you will also want to include certain other lease provisions designed to ensure that the Company will correct and/or pay for anything that goes wrong. Some examples of provisions that address these issues are included below.

19. Reclamation and Bonding

Description of Issue: After the Company ceases operations, you will want to ensure that it restores your land to its original condition or to a condition acceptable to you. However, even if you mandate that the Company promise to restore your land in the lease, and even though state law often requires that the Company engage in reclamation, you cannot guarantee that reclamation actually will occur. This can be because the Company has gone out of business. It can also be because the Company has sold the lease to another Company that is not as reputable and is willing to risk violating your state's reclamation laws (although you can limit the Company's ability to transfer the lease—see below).

Risks: If the Company fails to engage in reclamation, you can be left with the responsibility of reclaiming your land at your own expense. Reclamation is important, as fracking operations can result in water and soil contamination, and they can create residual waste materials and leave scars on your property, including roads, any pits that have been dug, and any areas that have been cleared of trees or other vegetation. While state law often requires the Company to post a bond, the size of this

bond is frequently far too small to provide significant protection.²⁸

Potential Lease Terms:

- You can require that the Company agree to restore your land to its original condition.²⁹
- You can require that the Company post a reclamation bond in an amount that will be sufficient to cover the costs of reclamation, should you need to do it yourself. Should the Company hire a subcontractor or other unrelated party to perform the reclamation work, you can require that the Company obtain a similar bond from such subcontractor that names you as the beneficiary.

Lessee shall repair and restore the Leased Premises, at its sole expense, to the condition in which the Leased Premises existed at the commencement of this Lease. Weather permitting, this work shall be completed within ninety (90) days after the completion of activities.

²⁸ Examples of the amount of financial assurances required by state or local laws, which often apply the guarantee to general compliance with applicable laws and regulations in addition to compliance with plugging and/or reclamation requirements, include the following: \$3,000/gas production well (Arkansas); \$5,000/well (Ohio); \$5,000 - \$10,000/well + \$1/ft. depending on the county in which the well is located (New Mexico); \$10,000 - \$20,000/well, depending on the depth of the well (Colorado, Wyoming); \$10,000 - \$30,000/well, depending on the depth of the well (Michigan); \$50,000/well (Dallas, for horizontal wells in West Virginia); \$50,000/well or the estimated cost of closure, whichever is greater (Maryland).

²⁹ To help ensure that original conditions are restored, consider documenting the original, pre-lease condition of your land, via photographs, videos, plans, written descriptions or other means, to create a record that you and the Company agree represents conditions prior to the commencement of any work under the lease. You can require that the Company assist in developing and/or financing this record of original conditions prior to beginning work on your property.

Prior to commencement of operations on the Leased Premises by or on behalf of Lessee, Lessee shall provide Lessor with financial surety or collateral for well-plugging, waste removal, and reclamation, in a form acceptable to both parties (i.e. surety bond, irrevocable letter of credit, or bank certificate of deposit) in an amount equal to or exceeding [xx] times the reasonably expected estimated total cost of plugging and abandonment of the well, removal and remediation of any waste and associated contamination, and reclamation of the Leased Premises. Said bond shall remain in effect until the plugging and abandonment of the well have been completed in compliance with applicable local and State law, the well site has been restored and re-vegetated, wastes have been removed, and any contamination remediated to the satisfaction of Lessor. This estimated total cost must include, at a minimum, expected labor rates, equipment rental/contracting rates, and a listing of all materials and their affiliated costs per unit required to plug and abandon each well and to reclaim associated areas on the Leased Premises.

20. Insurance, Indemnification, and Assignments

Description of Issue: Fracking operations create a risk of significant property damage, including environmental pollution, and/or personal injury. It is thus important that the Company, and not you, bears these risks and has the ability to pay when something goes wrong.

Risks: It would be financially damaging to you and your family if you were to be held liable for an accident or contamination that occurred or originated on your land as a result of the Company's operations.

Insurance

Some states require companies to purchase insurance policies to cover potential damage from their fracking-related activities.³⁰ However, many types of insurance policies do not ordinarily cover environmental pollution, so protection for harms arising from contamination may need to be addressed separately. In addition, coverage on some policies ends as soon as wells are plugged and abandoned, which could limit coverage for problems that are discovered or occur after that point. Assuming premiums are paid in full, insurance policies bought by a Company will continue to exist, and cover risks during their defined term, even if the Company that purchased it goes out of business.

Potential Lease Terms:

- You can require that the Company maintain insurance policies that cover specific risks, such as harm arising from environmental pollution or seismic incidents, and that provide minimum levels of coverage.
- You can require that the terms of insurance policies cover the life of a Company's operations under the lease and that claims can be made for damage that occurs or is discovered for a certain amount of time after the Company ends operations on your property.
- You can require that the Company pay the full premium for insurance policies when they are issued.

³⁰ Types of insurance coverage required by state and local laws and regulations include: commercial general liability; environmental impairment or pollution legal liability; explosion and collapse coverage; control of wells; worker's compensation; employer's liability; automobile liability; and umbrella or excess liability.

- You can require that you be named as an additional insured on the Company's policies with the same coverage and rights as the named insured, which means you can make claims directly to the insurance company, rather than having to go through the Company.

At all times while the Lease is in force, and for a longer period as specifically required, Lessee shall acquire and maintain insurance coverage for all of its operations on the Leased Premises, including any work performed on its behalf by contractors, subcontractors, or others. The insurance coverage maintained by Lessee shall include, at a minimum, the following policies and coverage, issued by a company licensed by the appropriate authority to do business in [your state]:

(a) Workers Compensation and Employer's Liability Insurance (\$[xx] minimum coverage per event and \$[xx] minimum coverage in the aggregate);

(b) Commercial General Liability Insurance (\$[xx] minimum coverage per event and \$[xx] minimum coverage in the aggregate);³¹

(c) Control of Wells Insurance (\$[xx] minimum coverage per event and \$[xx] minimum coverage in the aggregate);

(d) Business Auto Insurance (\$[xx] minimum coverage per event and \$[xx] minimum coverage in the aggregate);

(e) Environmental Pollution Liability or Pollution Legal Liability Insurance (\$[xx] minimum coverage per event and \$[xx] minimum coverage in the aggregate);³²

(f) Explosion and collapse coverage; and

(g) Umbrella Liability Insurance that applies to the insurance policies required by (a)-(f) herein (\$[xx] minimum coverage).

Lessee shall cause Certificates of Insurance evidencing the above coverage and copies of the policies to be provided promptly upon request to Lessor, or to such other representative of Lessor as Lessor may from time to time designate. The insurance policies required under this section, whether from the Lessee or any person acting in Lessee's place or on Lessee's behalf, shall include the Lessor as an additional insured with the same coverage

³¹ Examples of minimum required coverage for general liability policies, typically measured per occurrence, include: \$1-\$2 million (Colorado and Dallas respectively); \$5 million (Ohio with respect to horizontal wells); \$10 million (Santa Fe); and \$25 million (Flower Mound).

³² Examples of required levels of environmental insurance, measured per loss or per occurrence, include: \$1 million (Maryland); \$10 million (Dallas, Santa Fe); and \$25 million (Flower Mound).

and rights as the named insured with regard to the Leased Premises and all operations thereon, including any off-site impacts of Lessee's operations. The insurance policies required under this section shall reflect that the insurer has waived any right of subrogation against the Lessor.

Any coverage for environmental impairment or pollution shall, at a minimum, include coverage for on-site or off-site bodily injury, property damage, natural resource damages, loss of use of property, business interruption, costs incurred in the investigation, defense, or settlement of claims, and costs of cleanup and remediation. Such coverage shall apply, at a minimum, to non-sudden or sudden and accidental pollution arising from, or in support of, activities by Lessee or any subcontractor of Lessee at the Leased Premises, including as resulting from the escape or release of hazardous substances, smoke, vapors, fumes, acids, alkalis, toxic chemicals, liquids, gases, waste material, or other irritants, contaminants or pollutants.

Coverage for control of wells shall include, at a minimum, coverage for regaining control of out-of-control wells, evacuation expenses, re-drilling, clean-up, seepage, pollution, stuck drill stems, loss of equipment, experts and property damage.

In any claims-made policy, coverage must be continuous for at least sixty (60) months after approval of closure of the last well or completion of restoration at the Leased Premises, whichever is later. Coverage may be continued through a policy renewal or an extended reporting period, provided that, in either case, the retroactive date shall be the same as in the original policy.

Indemnification

In an indemnification agreement, the Company (the "Indemnitor") would agree to "defend" and "hold you harmless" against legal claims asserted by other people or

organizations that arise out of the Company's activities. For matters that cannot be identified quickly, such as environmental contamination or structural damage, indemnifications are written so as to survive longer than the agreement in which they are included, i.e., would continue after the Lease was terminated and/or after the Company finished operating on your property. Some indemnifications include a maximum amount, or "cap," on how much money they will provide. The size of a cap is often tied to the size of a deal, i.e., how much money is being exchanged under an agreement, but if royalties are likely to be less than the cost of activities such as well closures, reclamation, remediation, and the like, it would make more sense for the cap to be tied to the estimated cost of such activities. Some indemnifications are limited by a threshold amount, which means that the indemnification would not kick-in until you have a claim against the Company above the threshold amount. It is important to understand that an indemnification is only as valuable as the Company giving it: if a Company runs out of money, goes out of business, or enters bankruptcy, it likely will not be able to fulfill its indemnification obligations.

Potential Lease Terms:

- You can require that the Company indemnify and hold you harmless from any damages, loss, or claims arising out of its operations.
- You can require that, particularly with respect to health and environmental matters, the indemnification from the Company continues after the Lease is over and after the Company has finished working at your property.
- You can refuse to include any cap or threshold for claims for indemnification against the Company.

- If the Company leasing your property is a subdivision of a larger company, you can require that the parent company also sign and accept responsibility for the indemnification provision.
- You can require the Company to put money in an escrow account and/or post a bond or other form of surety to ensure the availability of funds for any potential indemnification claims for the term of the indemnification.
- You can make sure that any process for filing an indemnification claim described in the lease gives you ample time to notify the Company of a claim and only requires notification of claims when you have good reason to believe there is a claim. Claims that are not filed in accordance with the procedure set out in the Lease can be denied.

Lessee agrees to defend, indemnify, and hold harmless Lessor, its representatives, employees, trustees, volunteers, agents, heirs, successors, and assigns (“Indemnitees”), from and against all expenses, claims, demands, liabilities, and causes of action of any nature for nuisance, injury to or death of persons, and loss or damage to property, including, without limitation, reasonable attorney fees, expert fees and court costs, directly or indirectly arising from or incidental to Lessee’s (i) actions or inactions, (ii) occupation of the Leased Premises, (iii) activities and operations on the Leased Premises, (iv) marketing of production from the Leased Premises, or (v) violation of any safety, health or environmental requirement. For purposes of this paragraph, the term Lessee includes its holding company, parent company, agents, employees, guests, licensees, servants, contractors, independent contractors and any other person acting on its behalf or under its direction and control. The Lessee’s indemnity obligations survive the termination of this lease.

Assignments

Companies sometimes assign or transfer leases, or their rights thereunder, to other companies. An assignment or transfer of a lease, or interests under the lease, can be structured so that the Company retains liability under the lease, i.e., remains responsible to you if the new assignee/transferee doesn’t comply with the terms of the lease. Even when the Company retains liability, the assignee/transferee can also be required to assume liability under the lease and assume responsibility for fulfilling all conditions under the lease, including providing financial assurances and maintaining insurance coverage. Liability aside, as discussed above, you may have other reasons to prefer having one company responsible for the operations on your property rather than another: for example, the companies may have different reputations as to their standard of care and responsibility among your friends and neighbors, and one may adhere to voluntary standards such as those issued by the Center for Sustainable Shale Development while the other does not.

Potential Lease Terms:

- You can require that the Company get your consent before assigning or transferring the lease to anyone else³³ and that the Company not limit its liability by transferring the lease.
- You can require that the Company make any assignment or transfer of the lease contingent on the assignee or transferee assuming responsibility for all terms of the lease, including the provision of financial assurances and maintenance of insurance coverage prior to beginning any work under the lease or on your property.

³³ Even with such a provision in your lease, if the Company enters bankruptcy, the lease may be assigned to another company without your consent.

Lessee may not assign this Lease without obtaining Lessor's prior written consent, which consent shall not be unreasonably withheld or delayed. No assignment by Lessee (or any assignee of Lessee) of all or any part of or interest in this Lease shall relieve Lessee (or any assignee of Lessee) of any liability for breach of any obligation of Lessee hereunder, whether theretofore or thereafter accrued.

Lessee may not assign or transfer this Lease, or any interests thereunder, unless each assignee and transferee agrees to be bound by the provisions of this Lease to the same extent as if such assignee were an original party to this Lease. Proof of required financial assurances and insurance coverage must be provided to Lessor prior to an assignee or transferee undertaking any operations under the Lease or on the Leased Premises.

21. Violation of Lease Terms and Applicable Laws

Description of Activity: As mentioned above, there can be certain circumstances in which the Company (or a different company which ends up with rights under your lease) may fail to follow the terms of the lease or applicable laws. If this occurs, you want to be able to terminate the lease.

Risks: If the Company violates lease terms or applicable environmental laws, it could result in operating conditions that are dangerous to you, your family, your neighbors, animals, and/or your property, and potentially expose you to liability for the Company's violation of the law.

Potential Lease Terms:

- You can make it a condition of the lease for the Company to comply with all lease terms, applicable laws, and permit conditions, including but not limited to safety, permitting, monitoring,

and recordkeeping requirements, whereby any breach of this condition gives you the unilateral right to terminate the lease.

All operations conducted by Lessee shall comply with federal, state, and local statutes, regulations, ordinances, and orders, any applicable permits or other approvals, and the terms of this Lease. Lessee shall obtain all permits, plans, and other relevant documents required under any applicable law for the operations to be conducted on the Leased Premises. Lessee's failure to comply with any federal, state, or local law, any regulation or order of any enforcement agency having jurisdiction over Lessee's operations, or any of the terms of this Lease shall constitute a default under this Lease. If Lessor exercises its option to terminate the Lease, Lessee shall not be absolved of its obligations incurred up to that point, including those obligations that have been contemplated to remain in effect beyond the terms of the Lease itself.

22. Non-Disclosure Agreements

Description of Activity: The lease given to you by the Company's landman may contain a non-disclosure or confidentiality agreement. By signing a lease with such an agreement, you promise not to discuss the terms of your lease with anyone.

Risks: By signing a non-disclosure agreement, you forfeit your right to talk about the terms of your lease, even with your friends, neighbors and doctor; if the Company's actions result in harm to your family or your land, a non-disclosure agreement might prevent you from airing your grievances publicly. A nondisclosure or confidentiality provision may also limit your ability to seek expert review of monitoring results, chemical data, or other information generated or provided to you by the Company.

Potential Lease Terms:

- You can specify that you do not agree to any non-disclosure agreement.

Lessor does not consent to any non-disclosure, confidentiality, or similar agreement. Any reference to such an agreement in this lease is hereby removed and deleted.

23. Duration of Lease, Lease Extensions, and Renewals

Description of Issue: When signing a lease, you should be aware of the length of time you are potentially allowing the company to remain on your property and of how long the company might be able to keep the lease even without performing any actual drilling.

The length of an oil or gas lease is often determined by two factors. First, the lease will specify a “primary term.” The primary term is the minimum period for which the lease will run. If the Company does not begin operations within the primary term, it loses the lease. Primary terms can be anywhere between one and ten years, although three or five are typical.

Second, if the Company brings a well into operation during the primary term, the lease then remains in effect indefinitely during a secondary term for as long as the well is producing oil or gas at commercially paying quantities. During this period, the lease is said to be “held by production.”

The lease offered to you by the Company’s landman, however, will likely contain terms making it possible for the Company to extend the lease after the expiration of its primary term even if it is not producing oil or gas in such quantities.

Risks: Some leases give the Company the option to extend the lease beyond the primary term even if it has not yet drilled a well or is not actually producing oil or gas (and therefore is not paying you royalties) so long as a well on your land is *capable* of production.³⁴ However, if the

³⁴ See Ellen M. Gilmer, *Utica Landowners Parsing Contracts after Chesapeake Court Victory*, ENERGYWIRE, Jun 19, 2014 (quoting samples of standard lease language from Chesapeake Appalachia and Range Resources that give the companies the option to unilaterally extend a lease on the same terms).

Company has not yet begun extracting oil or gas from your land at the expiration of the primary term of your lease, you may wish to modify or terminate your relationship with the Company. For example, you may no longer wish to subject your land to an oil or gas lease, due to concerns about environmental or health effects. Or you may want to negotiate better financial terms or better protections based on new technological or regulatory developments.

In addition, many leases offered by a Company do not limit the amount of your land that the Company may hold by production; it is possible under some leases that a single well could hold by production several hundred acres of your land.

Potential Lease Terms:

- You can specify that the Company can extend the duration of the lease beyond the primary term only so long as it is producing oil or gas at commercially paying quantities.
- You can specify that the Company does not have the option to extend the lease if it is not producing oil or gas on your land at commercially paying quantities at the conclusion of the primary term.
- You can limit the amount of your land that may be held by production.

Upon the expiration of the Primary Term of this Lease, Lessee's rights under this lease shall terminate, except that Lessee may extend the Lease and continue to operate any well on the Leased Premises, subject to the terms and conditions of the Lease, as long as oil or gas is being produced from said well in commercially paying quantities. During the period in which a well is producing oil or gas in commercially paying quantities, Lessee shall

retain rights, subject to all of the terms and conditions of this Lease, to an area of no more than [xx] acres per such well. Without a separate written agreement, this Lease shall not extend beyond the Primary Term for any other reason. Lessee is expressly not granted the option to extend this lease upon like terms.

Risks: Leases offered by a Company contain very broad "force majeure" clauses, which provide that, in the event of unforeseen circumstances that prevent the Company from conducting operations, the lease may be extended. While force majeure clauses have traditionally been understood to refer to natural disasters, recently oil and gas companies have attempted to use these clauses to extend leases indefinitely when they have been prevented from conducting operations due to laws or regulations.

Potential Lease Terms:

- You can place a limit on the length of time the lease may be extended and limit the definition of what counts as force majeure.

The cumulative period of extension by reason of Force Majeure shall not exceed one (1) year. The following shall NOT constitute events of Force Majeure: market conditions; laws, regulations, or other local, state or federal government actions; or Lessee's inability to obtain necessary permits or approvals.

Notes

Notes

This Guide was prepared for informational purposes only. It does not, and is not intended to, constitute legal advice. Use of the Guide does not create an attorney-client relationship between you and the Emmett Environmental Law & Policy Clinic. Because of the rapid pace of change in this area of the law, the Guide should not be used as a substitute for competent legal advice from a licensed professional attorney in your state.



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