Regulation of Hydraulic Fracturing:
An Overview of Permitting Systems in Seven Oil and Gas Producing States

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Overview

The Federal Government does not regulate hydraulic fracturing operations. As a result, there is a wide variety of hydraulic fracturing regulation systems in oil and gas producing states. The following is a brief overview of the current state of federal regulation, a summary of the various permitting processes in oil and gas producing states, and an in depth look at the permitting systems of seven states.

Federal Regulation

The Energy Policy Act of 2005 exempted hydraulic fracturing from federal regulation under the Safe Drinking Water Act. This means that the federal government does not require drilling companies to provide a complete listing of the specific chemicals used in hydraulic fracturing operations to landowners, neighbors, local officials, or health care providers. Federal regulation does require industry to disclose what chemicals are in use through Material Data Safety Sheets (MSDS) available on the OSHA website.[1]

The Environmental Protection Agency (EPA) is in the process of holding public hearings to solicit advice from stakeholders on how EPA should focus and design a study of the impact of hydraulic fracturing on groundwater. In 2009, Diana Degette (D-CO), Jared Polis (D-CO), and Maurice Hinchey (D-NY) in the House and Bob Casey (D-PA) and Chuck Schumer (D-NY) in the Senate introduced identical bills that would allow the EPA to federally regulate hydraulic fracturing in states which have not already regulated hydraulic fracturing. The bill also requires the energy industry to reveal what chemicals are being used in the sand-water mixture. Because the bill has not passed, there is no current federal regulation of hydraulic fracturing.

State Regulation

Because there is no federal regulation, individual states have built regulation schemes for the use of hydraulic fracturing in the mining of natural gas, oil, and coal-bed methane. According to a 2009 US Department of Energy Study, twenty-seven states have current regulatory schemes governing the exploration and production of natural gas, oil, or coal-bed methane through hydraulic fracturing.[2] Each state's regulatory

[1] Lustgarten, Abrahm, 2009. "FRAC Act—Congress Introduces Twin Bills to Control Drilling and Protect Drinking Water." ProPublica. (Available at: http://www.propublica.org/article/frac-act-congress-introduces-bills-to-control-drilling-609)

[2] US Department of Energy, Office of Fossil Energy, National Energy Technology Laboratory. State Oil and Natural Gas Regulations Designed to Protect Water Resources. May 2009. Available at: (http://www.energyindepth.org/wp-content/uploads/2009/03/oil-and-gas-regulation-report-final-with-cover-5-27-20091.pdf)

program varies in scope, specificity and resource protection, but all have the common goal of ensuring the development of oil and natural gas resources is done in a way to protect water resources.

Regulation of hydraulic fracturing to protect water resources falls into the following categories in most states: permitting, well construction, temporary abandonment, well plugging, tanks, pits, and waste handling and spills.[3] Here, I focus on how different states protect water resources through the permitting process.

All oil and gas producing states have permitting requirements governing the locating, drilling, completion and operation of wells. In most states, the state legislature has delegated the authority to oversee permits to an oil and gas division, commission or board. This regulatory authority usually contains technical staff such as engineers, geologists, or environmental scientists who are trained and qualified to review applications for both conservation and water resource protection purposes.[4]

Some states require a geologist or engineer to review drilling permit application. According to the 2009 Department of Energy Study, four states require that agencies other than the oil and gas authority are involved in the permit review process either by requirement or upon request of the oil and gas agency.

The permitting process is important for many reasons. It provides the applicant/operator with an explicit overview of the regulations regarding drilling and provides the regulatory agency with the applicant's intent and plan for drilling. It also provides the regulatory agency with information regarding the planned well including location, depth, construction, water use, waste disposal, and emergency plans.[5]

The following is an in-depth review of seven states' laws regarding the permitting of wells that use hydraulic fracturing for oil and/or natural gas exploration and production.

Alabama

Hydraulic fracturing primary occurs in coal beds in Alabama. Before 2007, hydraulic fracturing was regulated through the state's Underground Injection Control program.[6] Under this regulatory scheme, fracturing was regulated as "an injection well which is used . . . for enhanced recovery of oil or natural gas" under the definition of Class II

[3] Wiseman, Hannah. "Untested Waters: The Rise of Hydraulic Fracturing in Oil and Gas Production and the Need to Revisit Regulation" *Fordham Environmental Law Review, Vol. 20, p. 115, 2009*.
[4] *Ibid.* 2.
[5] *Ibid. 2.*
[6] *Ibid.* 3.

injection wells in Alabama's underground injection well regulations.[7] An applicant for a Class II well injection was required to follow a two-step process. The first step was the application for drilling, conversion, or reentry of a plugged and abandoned well for injection purposes. The application required, among other things, a description of the procedures for the proposed injection, the "estimated location of the base of the deepest" underground source of drinking water, a description of where the fracturing fluids would come from and what they would consist of, the estimated pressure for injection the fluids, the amounts of fluids to be used daily, and proof that the operator has notified the public of the proposed fracturing.[8]

Next the applicant had to provide a wellbore sketch showing the depth of the injection formation and the "base of the deepest" underground source of drinking water, an affidavit and statement "specifying the source of injected fluids," and proof that the well would be protected with casing such that the "injected fluids cannot migrate" to the underground drinking water source.[9] This regulatory system covered a range of the effects of fracturing, from the use of toxic fluids to concerns about the source of the fluid and the potential migration of contaminants to nearby formations.

In 2007, however, Alabama's regulatory body, the Oil and Gas Board voted to exclude hydraulic fracturing from the Underground Injection Control program and to establish a regulatory system like most other oil and gas producing states.[10] Alabama now regulates fracturing activities through the oil and gas permitting process, although it has additional requirements to control the effects of fracturing. Operators proposing to fracture a coal bed must submit a $175 check with their proposal to fracture, and special approval from the Oil and Gas Board Supervisor is required before they begin to fracture. The Operators must provide the Supervisor with a document describing the name of the coal bed and the depth of proposed fracturing, maintain an inventory of fresh water supply wells within a one quarter mile radius of the fractured well.[11] They must also "affirm to the Supervisor, in writing," that the "inventory of fresh water supply wells have been evaluated and that the results of this evaluation indicate that the proposed hydraulic fracturing operations can be conducted without adverse impact on any fresh water supply wells or any fresh water resources."[12] The operator must also describe the likely maximum length and direction of the fractures, and detail which types

[7] Alabama Oil and Gas Board Rule 400-4-2-01(1) (Available at: http://www.ogb.state.al.us/ogb/rules.aspx)
[8] *Ibid.*
[9] *Ibid.*
[10] *Ibid.* 3.
[11] *Ibid.* 3.
[12] Alabama Oil and Gas Board Rule 400-3-8-03 (Available at: http://www.ogb.state.al.us/ogb/rules.aspx)

of fluids and other materials will be used in the operation.[13] The use of diesel fuel as a fracturing fluid is prohibited.

Arkansas

Arkansas requires applicants to submit a lease facility plan, including pit construction specifications with their permit application. Lease facility plans must be approved by the Arkansas Oil Conservation Commission and Arkansas Department of Environmental Quality before drilling can begin. This allows the Commission and Department to regulate not only the drilling of the well but also the construction of the well site and the excavation of pits.[14]

Montana

In Montana, drillers request approval for hydraulic fracturing as part of an application for a 'Permit to Drill' from Montana's Board of Oil and Gas Conservation (MBOGC). An operator must apply for a permit to inject, providing specific data about the company and other required information. Staff from the Oil and Gas Conservation Division of the Department of Natural Resource Conservation perform a technical review of the proposal, which also goes through a public notice and hearing process. MBOGC may then issue, modify, or deny the permit; regulate the volume and characteristics of the fluids to be injected; and impose operational requirements or limitations for the well. [15]

With regards to horizontal drilling, an operator develops a temporary spacing plan for where the wells will be located on the site and then after production is established, returns to the Board for approval of permanent spacing. Landowners may contest the operator's spacing at a hearing if they are concerned that the operator has planned to space wells too close to their property.[16] Once a drilling permit is approved and the operation is completed, the driller submits a Completion Report. The operator must report information such as the length of fractures and the pressures as well as the types of fluids used in the Completion Report.

There is a separate permitting process for operators that wish to fracture after submitting a Completion Report. These operators must submit a form entitled "Sundry

[13] *Ibid.*
[14] Arkansas Oil and Gas Commission General Rules and Regulations B-1 (Available at http://www.aogc.state.ar.us/OnlineData/Forms/Rules%20and%20Regulations.pdf)
[15] Montana Board of Oil and Gas, Board Summaries. (Available at: http://bogc.dnrc.state.mt.us/BoardSummaries.asp)
[16] *Ibid.* 2.

Notices and Report of Wells" to the Board, and provide "Notice of Intention to Stimulate or Chemically Treat." In these forms, the operator must describe the formation in which the hydraulic fracturing will occur and the hydraulic fracturing process to be followed.[17]

New York

On August 4, 2010, the New York State Senate voted to issue a temporary moratorium on horizontal drilling/hydraulic fracturing for natural gas in the Marcellus Shale. The state Assembly must also take up the bill and is not expected to do so until September. The moratorium proposed in the bill would prevent new drilling permits from being issued for the Marcellus Shale until May 15, 2011.[18]

New York has been working to update its Generic Environmental Impact Statement and create a Supplemental Generic Environmental Impact Statement to assess the environmental effects of hydraulic fracturing and horizontal drilling during the moratorium. The Department of Environmental Conservation (DEC) developed a draft Supplemental Generic Environmental Impact Statement (draft SGEIS) for horizontal drilling/hydraulic fracturing. The draft SGEIS analyzes the range of potential impacts of shale gas development using horizontal drilling and high-volume hydraulic fracturing. The draft SGEIS outlines safety measures, protection standards and mitigation strategies that operators would have to follow to obtain permits. The DEC held a public comment period on the draft SGEIS and is currently evaluating the comments received.[19]

Even though there is a moratorium on drilling, natural gas companies and drill operators are still able to submit applications for permits to drill in New York. An operator must submit an application for a 'Permit to Drill, Deepen, Plug Back or Convert a Well' and a description of the proposed drilling program, three copies of a plat, the permit fee, and an Environmental Assessment Form.[20] The permit application must indicate whether the drilling will be vertical, directional, or horizontal, the proposed target formation, the type of well, the drilling fluid to be used, and the type of tools used.[21]

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[17] Montana Board of Oil and Gas Conservation, Sundry Notices and Report of Wells, (Available at: http://bogc.dnrc.state.mt.us/PDF/Form2.pdf.)
[18] Navarro, Mireya. "N.Y. Senate Approves Fracking Moratorium." New York Times Online, Green Blog. August 4, 2010. (Available at: http://green.blogs.nytimes.com/2010/08/04/n-y-senate-approves-fracking-moratorium/?scp=1&sq=hydraulic%20fracking&st=cse)
[19] New York State Department of Environmental Conservation. Marcellus Shale Information. (Available at: http://www.dec.ny.gov/energy/46288.html)
[20] New York State Department of Environmental Conservation. Well Permitting Process. (Available at: http://www.dec.ny.gov/energy/1772.html)
[21] *Ibid.* 3.

The Environmental Assessment form requires the applicant to answer detailed questions regarding water storage and disposal and describe how drilling and stimulation fluids will be contained and disposed of. The applicant must also describe the project and its dimensions, and the percentage of the project site that is forest or agricultural land or other vegetated land.[22] The applicant must indicate the "environmental resources on/near the project site," such as whether the site is "over a primary or principal aquifer; whether it is within a certain distance of a public water supply well, surface municipal water supply, or "lake, stream, or other public surface water body"; within an agricultural district; in a flood plain or regulated wetland; in an area with threatened or endangered animal life; or in a coastal zone management area or "Critical Environmental Area."[23] For example, applicants must complete an environmental assessment if a proposed well is within 2,000 feet of a municipal well and a supplemental environmental impact statement if within 1,000 feet of a municipal water well.[24] Furthermore, the applicant must explain whether topsoil will be disturbed and whether the applicant will implement erosion control measures as well as whether the applicant will build new access roads or use existing corridors.[25]

Ohio

While all twenty-seven states can deny a permit if the application contains insufficient information to make a technical determination, only some states also have the authority to deny a permit for other reasons such as outstanding violations or lack of a state license.[26] For example, in Ohio, "A Notice of Material and Substantial Violation (NOMSV) may cause permits to be denied; imminent danger is also cause for A denial/suspension of a permit."[27]

The Ohio State Legislature passed an oil and gas drilling reform law that went into effect June 30, 2010. The new law revises the application requirement concerning notification of the submission of an application for a permit to drill a new well. It now requires the operator to provide notice by regular mail notice to the owner of each parcel of real property, rather than to the owner of each occupied dwelling as in former law, that is within 500 feet of the surface location of the well. The operator must also provide notice to the executive authority of the municipal corporation or the board of township trustees

[22] New York State Department of Environmental Conservation. Environmental Assessment Form. (Available at: http://www.dec.ny.gov/docs/materials_minerals_pdf/eaf_dril.pdf)
[23] *Ibid*.
[24] *Ibid.* 17 (http://www.dec.ny.gov/energy/46288.html)
[25] *Ibid.* 20. (Available at: http://www.dec.ny.gov/docs/materials_minerals_pdf/eaf_dril.pdf).
[26] *Ibid.* 2.
[27] *Ibid.* 2.

of the township, as applicable, in which the well is to be located. This new requirement only applies to a new well within an urbanized area.[28]

The new law also establishes new time periods within which a permit must be issued if a well or proposed well will be or is within an urbanized area; increases the application fee for a permit to drill a well from $250 to $500 to conduct activities in a township with a population of fewer than 10,000, rather than 5,000 as in former law; and establishes an additional application fee of $5,000 if the application is for a permit that requires mandatory pooling.

Finally, the new law requires the Division of Mineral Resources Management in the Department of Natural Resources to conduct a site review prior to the issuance of a permit to identify and evaluate any site-specific terms and conditions that may be attached to a permit to drill a proposed well that will be located within an urbanized area, requires a representative of the Division at the site review to consider fencing, screening, and landscaping requirements for similar structures in the applicable community, and requires the terms and conditions that are attached to the permit to include the establishment of fencing, screening, and landscaping requirements for the surface facilities of a proposed well, including a tank battery of the well.

Pennsylvania

To drill a new Marcellus Shale natural gas well in Pennsylvania, the operator must obtain a well permit from Pennsylvania's Department of Environmental Protection. In the permit application, the applicant must show the location of the well, proximity to coal seams, and distances from surface waters and water supplies. Technical staffs in DEP's regional offices review the permit application to determine whether the proposed well would cause environmental impacts, conflict with coal mine operations, or exceed well spacing requirements. Operators must submit reports on well completion, waste management, annual production and well plugging.[29]

As part of the permit application process, drilling companies must identify where they plan to obtain and store the water used in their drilling operations. When applying for a permit, drillers must specify the sources and location of fresh water and the anticipated impacts of water withdrawals on water resources, and obtain approval from the appropriate river basin commission. Pits or impoundments with an embankment used to temporarily store water for drilling activities must meet DEP standards for construction

[28] Vendel, Eric. Final Analysis of SB 165. Ohio Legislative Service Commission. June 30, 2010. (Available at: http://www.lsc.state.oh.us/analyses128/10-sb165-128.pdf)
[29] Pennsylvania Department of Environmental Protection. Marcellus Shale Document. (Available at: http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-77964/0100-FS-DEP4217.pdf)

and may also require a DEP dam permit. Wells cannot be drilled within 200 feet of structures, or within 100 feet of streams and wetlands. The locations of wells, access roads and related drilling operations are usually negotiated as part of the lease agreement.[30] Pennsylvania law requires drillers to case and grout wells through all fresh water aquifers before drilling through deeper zones known to contain oil or gas. This casing protects groundwater from pollutants inside the well, and keeps water from the surface and other geologic strata from mixing with and contaminating groundwater.[31]

The operator must also post a bond. The bond is a financial incentive to ensure that the operator will adequately perform the drilling operations, address any water supply problems the drilling activity may cause, reclaim the well site, and properly plug the well upon abandonment. The bond amount for a single well is $2,500; a blanket bond to cover any number of wells is $25,000.[32]

Drilling wastes must be collected and stored in pits with synthetic liners. Waste fluids must be collected and treated at an authorized water treatment facility. Drilling companies must also identify where the produced wastewater will be stored, treated and disposed. Pits or impoundments with an embankment for temporarily storing drilling wastes must meet DEP standards for construction (e.g., synthetic liners) and may also require a DEP dam permit. Waste water (fluids) must be reused and recycled, or collected and treated at an authorized waste water treatment facility. DEP approval is required before the receiving treatment facility can accept the wastewater for processing and/or disposal.

The state is not involved in regulating/negating lease agreements between mineral property owners and producers, and does not audit payments, read or calibrate meters or tanks, or otherwise get involved in lease matters. In the event of a dispute, county courts hear suits for property damage or disputed lease matters.[33]

Texas

Texas has no regulation specific to hydraulic fracturing. Instead, regulation of hydraulic fracturing occurs through approval of the drilling permit application. Although these regulations do not specifically mention fracturing, they apply to various components of the fracturing process. Each operator wishing to drill and fracture a well in Texas must

[30] *Ibid.*
[31] *Ibid.*
[32] *Ibid*
[33] *Ibid.*

submit an application for a permit to drill, deepen, plug back, or reenter any oil well.[34] Texas does not require an environmental review or assessment of a proposed drilling operation, unlike most states, but it does require operators to "obtain and file a 'Water Board Letter' from the Texas Commission on Environmental Quality."[35] In a "Surface Casing" Letter, the operator must submit a "location map" with surveys and a copy of the well's log (if the driller is re-entering a previously-drilled well).[36] After reviewing the request, the Commission on Environmental Quality may require the operator to obtain a groundwater protection recommendation letter from the Commission, which "states the depth to which groundwater must be protected in the well or other boring."[37]

[34] *Ibid.* 3
[35] RR Commission of Texas. Barnett Shale Information. (Available at: http://www.rrc.state.tx.us/barnettshale/index.html)
[36] Texas Commission on Environmental Quality. Requesting a Surface Casing Letter. (Available at: http://www.tceq.state.tx.us/permitting/waste_permits/surface_casing/surf_casing.html)
[37] *Ibid.*