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Hydraulic Fracturing and Chemical Disclosure: What you do not Know Could Hurt You!

Chris Boling

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HYDRAULIC FRACTURING AND CHEMICAL DISCLOSURE: WHAT YOU DO NOT KNOW Could Hurt You!

Chris Boling*

In the last five years, the oil and gas industry has dramatically changed due to a process known as hydraulic fracturing. When used in conjunction with horizontal drilling, hydraulic fracturing has made it economically feasible to access vast domestic reserves of natural gas. Recently, hydraulic fracturing has come to the forefront of media and political debate. Environmental groups, investigative journalists, and even filmmakers have engendered public scrutiny of both the negative environmental effects of hydraulic fracturing operations and the perceived deficiencies in regulatory oversight of the practice. One of the most controversial issues surrounding hydraulic fracturing is the extent to which the composition of fluids used in hydraulic fracturing treatments should be disclosed. In the past two years, state legislators and regulators have worked diligently to enact new laws and regulations governing disclosure of hydraulic fracturing fluids in response to this issue. This Note addresses the current controversy surrounding the disclosure of hydraulic fracturing fluids and critiques how some states have responded. Further, this Note proposes a “model” regulation that strikes a balance between environmental concerns and industry needs while incorporating the favorable aspects of current state regulations.

* J.D. Candidate, May 2013, Loyola Law School Los Angeles; B.B.A., May 2010, Gonzaga University. I would like to thank Professor Katherine Trisolini for her invaluable guidance and feedback. Thank you to the members of the Loyola of Los Angeles Law Review, and a special thank you to Allison Chan, Elian Dashev, Leo Li, Rachael Schiffman, Anna Kim, Sean Degarmo, Kaytee Vota, Robert Shepard, and Scott Klausner for their outstanding editorial support. Finally, and most importantly, I want to thank my parents and brothers for serving as a continual source of inspiration and encouragement.
TABLE OF CONTENTS

I. INTRODUCTION ............................................................................. 259

II. BACKGROUND ............................................................................. 262
   A. What Is Hydraulic Fracturing? ........................................ 262
   B. How the Issue Came About: The Effects of the LEAF
      Litigation and the Energy Policy Act of 2005 ............... 265

III. STATEMENT AND CRITIQUE OF EXISTING STATE LAW ............... 267
   A. Who Is Required to Disclose? ......................................... 268
      1. Overview of the Law ................................................. 268
      2. Critique of State Law: Wyoming, Arkansas, and
         Texas........................................................................ 268
   B. What Are They Required to Disclose? ............................ 269
      1. Level of Disclosure .................................................... 269
         a. Overview of the law .............................................. 269
         b. Critique of state law: Louisiana, Pennsylvania,
            Arkansas, and Texas............................................... 271
      2. Concentration Information............................................ 274
         a. Overview of the law.............................................. 274
         b. Critique of state law: Wyoming and Texas ......... 276
      3. Trade-Secret Protection ............................................. 278
         a. Overview of the law .............................................. 278
         b. Critique of state law: Wyoming and Arkansas ..... 280
   C. To Whom Are They Required to Disclose? ..................... 282
      1. Overview of the Law ................................................. 282
      2. State Law Critique: Wyoming and Texas .................. 282

IV. PROPOSED “MODEL” REGULATORY FRAMEWORK ..................... 283
   A. The Affirmative Obligation: Requiring All Parties to
      Disclose........................................................................... 284
   B. Achieving Full Disclosure Through a System-Based
      Concentration Requirement and EPCRA’s Trade
      Secret Criteria ................................................................. 285
   C. The Importance of State Oversight, Emergency
      Precautions, and Public Knowledge ............................... 287

V. CONCLUSION ............................................................................... 288

APPENDIX 1 ...................................................................................... 290
APPENDIX 2 ...................................................................................... 291
I. INTRODUCTION

In a time of widespread political and economic instability abroad, reliance on foreign energy must be reexamined. Every year, the United States spends hundreds of billions of dollars on imports of foreign oil.\(^1\) Although the United States is the third largest producer of crude oil, in 2011 forty-five percent of the petroleum used in the United States was imported.\(^2\) Such a reliance on foreign sources of energy not only decreases U.S. energy security but also contributes to the multibillion-dollar trade deficit and diverts much needed investment dollars that could otherwise be used to stimulate the domestic economy.\(^3\) A recent surge in domestic natural gas production has emerged as a possible solution that could help us regain our energy independence.

Over the past three years, the face of domestic production of natural gas has changed significantly. In the summer of 2008, the price of oil was climbing, as was the domestic demand for energy. Amid concerns of a perceived shortage of natural gas in the United States, the price spiked to just over $13 per thousand cubic feet (mcf).\(^4\) Prices subsequently dropped from these record highs and began to stabilize in the summer of 2009,\(^5\) about the same time that the Potential Gas Committee published a report that reflected a thirty-five percent increase in domestic natural gas reserves as a result of increased production from shale formations.\(^6\) A little less than a year following the publication of this report, the U.S. Energy Information Administration (EIA) stated that at the current growth


rate of domestic natural gas production, U.S. imports of natural gas would decrease from thirteen percent in 2008 to six percent in 2035, and the United States may even be able to establish itself as a significant energy exporter. In October 2011, the cost of the same mcf of natural gas was approximately $4, and more recently, the price has dropped below $3.

The extraction method energy companies utilize to achieve such domestic feats—hydraulic fracturing—has been at the forefront of media and political debate. Although the legal challenges to the adequacy of laws regulating hydraulic fracturing began in the mid-1990s, the issue really began to draw publicity when the Energy Policy Act of 2005 expressly exempted hydraulic fracturing from regulation under the Safe Drinking Water Act (SDWA). Since then, environmental groups, investigative journalists, and even filmmakers have engendered public scrutiny of both the negative environmental effects of hydraulic fracturing operations and the perceived deficiencies in regulatory oversight of the practice.

In June 2009, legislation was introduced in both the House of Representatives and the Senate (the “FRAC Act”) that would regulate hydraulic fracturing under the Safe Drinking Water Act. This bill also, for the first time, recognized the need for a more effective system of disclosing the chemical makeup of the fluids used

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8. Id.
15. See, e.g., GASLAND (HBO 2010).
in hydraulic fracturing (“Frac Fluid”). Since then, Frac Fluid disclosure has developed into one of the central issues surrounding hydraulic fracturing.

The FRAC Act has been fervently opposed by the natural gas industry (“Industry”), which sees federal regulation as overreaching and unnecessary. However, effective regulation of hydraulic fracturing operations, whether at the federal or state level, is essential to ensure public trust and acceptance of the process and to rehabilitate the Industry’s somewhat maligned image. Thus, a middle ground must be found to alleviate the pressures facing the industry and reassure an understandably concerned public.

Over the past two years, state legislators and regulators have worked diligently to enact new laws and regulations in response to the Frac Fluid disclosure issue. In September 2010, Wyoming took the first step toward a state-by-state regulatory scheme by passing a hydraulic fracturing disclosure regulation. Since then, states such as Arkansas, Texas, Pennsylvania, Montana, and more recently Colorado have passed their own versions of Frac Fluid disclosure regulations. While these regulations represent a significant step in the right direction, they are not all “created equal,” and several have significant shortcomings.

This Note addresses the current controversy surrounding the disclosure of hydraulic fracturing fluids and critiques what certain states have done in response. Further, in order to strike a balance between the environmental groups and the Industry, this Note will propose a “model” regulation that takes all of the favorable aspects of current state regulations into account. Part II provides an overview

17. H.R. 2766, 111th Cong. § 2(b) (2009); S. 1215, 111th Cong § 2(b) (2009).
22. TEX. NAT. RES. CODE ANN. § 91.851 (West 2011).
of hydraulic fracturing, describes the various chemical additives that are being pumped into the ground by the oil and gas industry, and includes a discussion of how the issues surrounding hydraulic fracturing came about.

Part III looks at the various components of an effective Frac Fluid disclosure regime and, in essence, provides a rubric by which to analyze current state efforts to regulate the disclosure of Frac Fluids. It then addresses the strengths and weaknesses of the various disclosure approaches taken by current state regulations.

Part IV then takes the same guidelines for disclosure and formulates a “model” regulation that attempts to find a balance between full disclosure (satisfying environmental groups and the public) and protection of legitimate trade secrets (satisfying the Industry). Finally, Part V concludes that a state-level “model” regulation would not only achieve one of the primary advantages of federal regulation, uniformity, but would also accomplish the extremely difficult feat of satisfying both the Industry and environmental groups.

II. BACKGROUND

A. What Is Hydraulic Fracturing?

Although the public became aware of it only recently, hydraulic fracturing is a process that has been in use for over sixty years. However, only in the past decade has it been used in conjunction with horizontal drilling to release natural gas trapped in shale formations. The combination of these two techniques has led to “higher success and recovery rates, reduced cycle times, lower costs, and shorter times required to bring new shale gas production to market.” Just over ten years ago, shale gas made up one percent of America’s gas supplies; today, it makes up twenty-five percent.
Since shale formations have very low permeability, in order to extract natural gas from shale, the Industry must create “artificial permeability” by pumping high volumes of Frac Fluids down the well to induce small cracks in the rock. Hydraulic fracturing allows for the flow of hydrocarbons by either creating new fractures or expanding existing ones. Approximately 98%–99.5% of the fluid that is pumped underground in a hydraulic fracturing treatment consists of water and a “proppant”—usually sand. The “proppant” is added to the hydraulic fracturing fluid to prop open the newly created fractures and facilitate the flow of gas to the well bore. The current debate concerning the composition and disclosure of Frac Fluids focuses on the remaining 0.5%–2% of the fluid.

Various chemical additives, both designed to perform specific functions in the hydraulic fracturing process and tailored to the unique geological attributes of the stimulated shale formation, compose the remaining portion of the Frac Fluid. Depending on the petrophysical and geochemical qualities of the shale formation, between three and twelve additives are used in varying concentrations. Each additive is made up of a variety of chemical constituents that contribute to its specific, engineered purpose. Table 1 provides a list of additives used in a sample Frac Fluid and their functions. For instance, the friction reducer allows the Frac Fluid to be pumped to the target formation at a higher rate and with less pump pressure. While the function of the additives stays the same, the chemical constituents used, and the concentrations in

32. See GROUND WATER PROT. COUNCIL & ALL CONSULTING, supra note 3, at 56.
35. CHESAPEAKE ENERGY, supra note 33.
36. See GROUND WATER PROT. COUNCIL & ALL CONSULTING, supra note 3, at 61.
37. “Petrophysical” refers to properties that pertain to fluid behavior within the shale formation (e.g., porosity, permeability, etc). Schlumberger Oilfield Glossary, supra note 31.
38. See GROUND WATER PROT. COUNCIL & ALL CONSULTING, supra note 3, at 61.
39. See id.
which they are used, vary depending on the supplier of the additive and the needs of a given well.\textsuperscript{41} This proprietary chemical makeup of each additive is precisely what service companies have been reluctant to divulge.\textsuperscript{42}

**Table 1. Additives and Their Purpose\textsuperscript{43}**

<table>
<thead>
<tr>
<th>Additive</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acid</td>
<td>Helps dissolve minerals and initiate cracks in the rock</td>
</tr>
<tr>
<td>Biocide</td>
<td>Eliminates bacteria in the water that produce corrosive byproducts</td>
</tr>
<tr>
<td>Breaker</td>
<td>Breaks down the gelling agent after the proppant is delivered</td>
</tr>
<tr>
<td>Clay Stabilizer</td>
<td>Prevents formation clays from swelling</td>
</tr>
<tr>
<td>Corrosion Inhibitor</td>
<td>Prevents corrosion of the pipe, primarily from the acid additive</td>
</tr>
<tr>
<td>Crosslinker</td>
<td>Maintains fluid viscosity as temperature increases</td>
</tr>
<tr>
<td>Gelling Agent</td>
<td>Thickens the water in order to more effectively transport the proppant (sand)</td>
</tr>
<tr>
<td>Iron Control</td>
<td>Prevents precipitation of metal</td>
</tr>
<tr>
<td>pH Adjusting Agent</td>
<td>Maintains effectiveness of other components (i.e. crosslinkers)</td>
</tr>
<tr>
<td>Surfactant</td>
<td>Used to break down the surface tension of the fracturing fluid during flowback</td>
</tr>
</tbody>
</table>

\textsuperscript{42} See Edwards et al., \textit{supra} note 19.
\textsuperscript{43} See CHESAPEAKE ENERGY, \textit{supra} note 33, at 2.

Before exploring the current legal developments surrounding hydraulic fracturing and Frac Fluid disclosure, it is important to describe how the issue evolved to this point. Long before the onset of widespread public concern, there was a legal debate concerning the adequacy of hydraulic fracturing regulations. In 1994, the Legal Environmental Assistance Foundation (LEAF) was the first group to suggest that hydraulic fracturing was an underregulated practice.44

At issue in the LEAF litigation was whether the Environmental Protection Agency’s (EPA) approval of Alabama’s underground injection control (UIC) regulations was proper.45 LEAF petitioned the EPA to withdraw its approval since the program did not regulate hydraulic fracturing activities associated with coalbed methane gas production.46 In 1995, the EPA denied the petition, finding that hydraulic fracturing operations did not fall under the definition of “underground injection” for purposes of the SDWA.47 The EPA reasoned that “underground injection” referred to injections for which the primary purpose was to place fluids underground for disposal, but not for recovery of oil and gas.48

Unsatisfied with the EPA’s decision, LEAF brought suit in the U.S. Court of Appeals for the Eleventh Circuit on June 19, 1995, seeking a ruling that the EPA was legally obligated to regulate hydraulic fracturing under the UIC Programs mandated by the SDWA.49 The court sided with LEAF, concluding that hydraulic fracturing activities did constitute “underground injections” and that the EPA’s interpretation could not be “squared with the plain

45. The UIC Program was established under the Safe Drinking Water Act to regulate all aspects of injection wells that place fluids underground for storage and disposal. Underground Injection Control Program, EPA, http://water.epa.gov/type/groundwater/uic/index.cfm (last visited Jan. 3, 2013).
48. Legal Envtl. Assistance Found., Inc., 118 F.3d at 1471.
49. Id. at 1469, 1472.
language of the statute and thus must fall.\textsuperscript{50} While the decision was
not binding on the EPA outside of the Eleventh Circuit, it marked the
beginning of the debate concerning both the adequacy of hydraulic
fracturing regulations and the federal government’s role in such
regulations.

Following the outcome in the LEAF litigation in 1997, the
Ground Water Protection Council,\textsuperscript{51} the Interstate Oil and Gas
Compact Commission,\textsuperscript{52} and the EPA\textsuperscript{53} all conducted studies into the
threat hydraulic fracturing posed to underground drinking water
supplies. Each study reached the same conclusion: hydraulic
fracturing had never contaminated drinking water and “poses little or
no threat” to underground sources of drinking water.\textsuperscript{54}

With the support of these studies, the Industry moved to reverse
the Eleventh Circuit’s ruling in \textit{LEAF v. EPA}\textsuperscript{55} legislatively. With
the passage of the Energy Policy Act of 2005 (the “Act”), Congress
amended the SDWA to provide that “underground injection”
specifically excludes “the underground injection of fluids or
propping agents . . . pursuant to hydraulic fracturing operations
related to oil, gas, or geothermal production activities.”\textsuperscript{56} The Act
effectively overruled the \textit{LEAF} decision and codified the
interpretation of the SDWA that both the EPA and the Industry had
worked under for the previous three decades.\textsuperscript{57} However, the

\textsuperscript{50} Id. at 1478.
\textsuperscript{51} \textit{Ground Water Prot. Council, Survey Results on Inventory and Extent of
Hydraulic Fracturing in Coalbed Methane Wells in the Producing States} (1998),
\textit{available at} http://cogcc.state.co.us/RuleMaking/PartyStatus/FinalPrehearingStmts/HESIExhibits.PDF.
\textsuperscript{52} \textit{Interstate Oil & Gas Compact Comm’n, States Experience with Hydraulic
Fracturing: A Survey of the Interstate Oil and Gas Compact Commission} (2002),
\textit{available at} http://www.energyindepth.org/PDF/IOGCC%20Hydraulic%20Fracturing%20Study
\textsuperscript{53} \textit{U.S. Envtl. Prot. Agency, EPA 816-R-04-003, Evaluation of Impacts to
Underground Sources of Drinking Water by Hydraulic Fracturing of Coalbed
Methane Reservoirs} (2004), \textit{available at} http://www.epa.gov/safewater/uic/pdfs/es_6-8
-04.pdf.
\textsuperscript{54} Id. at ES-1.
U.S.C. § 300h(d)(1) (2006)).
\textsuperscript{57} \textit{See Dennis Lathe, Coalbed Methane Ass’n of Ala., LEAF v. EPA: A
Challenge to Hydraulic Fracturing of Coalbed Methane Wells in Alabama} 2
amendment drew immediate criticism and became known as the “Halliburton loophole” and the “Cheney exemption” because Vice President Dick Cheney, ex-CEO of Halliburton, played a role in passing the Act.\textsuperscript{58}

Since its exemption in 2005, hydraulic fracturing has drawn increased scrutiny from environmental groups, the media, and the public. The process’s potential impact on underground sources of drinking water has fueled much of the critique. After passage of the Act, there was a string of claims alleging that chemicals from nearby hydraulically fractured wells contaminated drinking water supplies.\textsuperscript{59} Many of these claims, however, have been dismissed as not being related to hydraulic fracturing.\textsuperscript{60} The following part summarizes a representative sample of recent state regulations and critiques their effectiveness in providing a robust disclosure regime for Frac Fluids.

### III. STATEMENT AND CRITIQUE
OF EXISTING STATE LAW

In order to provide some structure to the analysis of current Frac Fluid disclosure regulations, it is helpful to establish a common set of criteria to use in assessing regulatory effectiveness. This Note focuses on three criteria: (1) who is required to disclose information, (2) what information is required to be disclosed, and (3) to whom the information must be disclosed. Looking at current and proposed regulations with these categories in mind will help bring out their individual strengths and weaknesses. This part provides an overview of each category and then critiques regulations currently in effect.\textsuperscript{61}


\textsuperscript{59} See Lustgarten, supra note 14.

\textsuperscript{60} See generally, COLO. OIL & GAS INFO. SYS.: COMPLAINT REPORTS (2009), available at http://cogcc.state.co.us/cogis/ComplaintReport.asp?doc_num=200207912 (finding that the state sampled the water well and “[s]ample results . . . show naturally occurring biogenic methane gas in well and no impact from O&G operations”); COLO. OIL & GAS INFO. SYS.: COMPLAINT REPORTS (2008), available at http://cogcc.state.co.us/cogis/ComplaintReport.asp?doc_num =200190138 (finding that “dissolved methane in well water appears to be biogenic in origin . . . [and] [t]here are no indications of oil & gas related impacts to water well”).

\textsuperscript{61} Pennsylvania passed Act 13, effective April 12, 2012, which addresses many of the issues discussed below. See 58 PA. CONS. STAT. ANN. § 3222.1 (West 2012).
A. Who Is Required to Disclose?

1. Overview of the Law

The first major point that a disclosure regulation must address is who is required to disclose the Frac Fluid information. This task could fall to one of three different groups: the operator of the well, the service company that conducts the hydraulic fracturing treatment on behalf of the operator, or the supplier of one or more of the additives that are included in the Frac Fluid.

2. Critique of State Law: Wyoming, Arkansas, and Texas

The task of determining the difference between a successful and unsuccessful disclosure regulation begins with defining who carries the obligation to disclose information. While the difference in language may seem minor, its impact on the clarity and effectiveness of the regulation can be substantial. A review of the disclosure regulations passed in Wyoming, Arkansas, and Texas will illustrate this point.

Wyoming’s regulation provides that “the Owner or Operator or service company shall provide to the Supervisor . . . the chemical additives, compounds and concentrations or rates proposed to be mixed and injected.” On its face, this provision seems to resolve the issue of who must disclose, since it requires that one of the three groups listed provide information regarding the Frac Fluid to the Supervisor, a state official. However, while the provision lists the parties who could have information regarding the Frac Fluid, it fails to impose a clear obligation to disclose on any one group. This

63. Id.
65. Id.
66. WYO. OIL & GAS CONSERV. COMM’N, supra note 20.
67. ARK. OIL & GAS COMM’N, supra note 21.
68. TEX. NAT. RES. CODE ANN. § 91.851 (West 2011).
69. WYO. OIL & GAS CONSERVATION COMM’N, supra note 20.
70. Id.
failure to specifically identify the “responsible party” could lead to a
collapse in information and to finger pointing as to whose
responsibility it was to report.\textsuperscript{71} To ensure that this does not happen,
Arkansas and Texas take a different approach.\textsuperscript{72}

Arkansas and Texas impose an affirmative obligation on both
the service companies and the suppliers to provide the well operator
with all of the information the operator needs to fulfill the state Frac
Fluid disclosure regulations.\textsuperscript{73} In doing so, these regulations also
ensure that the information will flow to the appropriate party.

\textbf{B. What Are They Required to Disclose?}

The next major component of any Frac Fluid disclosure
regulation deals with what the operator, service company, or supplier
must disclose. The answer to this question depends on how the
regulation addresses three subcomponents of disclosure: the level of
disclosure, the concentration information, and the handling of trade
secrets.\textsuperscript{74}

1. Level of Disclosure

\textit{a. Overview of the law}

To best explain how regulations differ on “the level of
disclosure,” the composition of a given hydraulic fracturing fluid
must first be understood. As discussed above,\textsuperscript{75} a typical Frac Fluid
is composed of water, sand, and anywhere from three to twelve
chemical additives, each with its own specific purpose.\textsuperscript{76} Each
additive is further broken down into the chemical constituents that,
together, compose the additive.\textsuperscript{77} The chemical constituents that
compose an additive vary based on the needs of a given well.\textsuperscript{78}
Virtually all current disclosure regulations require some disclosure of

\begin{itemize}
  \item \textsuperscript{71} Boling, \textit{supra} note 64.
  \item \textsuperscript{72} See \textit{ Ark. Oil \& Gas Comm’n}, \textit{supra} note 21, at r. B-19(1)(4); \textit{ Tex. Nat. Res. Code
          Ann.} § 91.851(a)(2) (West 2011).
  \item \textsuperscript{73} See \textit{ Ark. Oil \& Gas Comm’n}, \textit{supra} note 21, at r. B-19(1)(4); \textit{ Tex. Nat. Res. Code
          Ann.} § 91.851(a)(2) (West 2011).
  \item \textsuperscript{74} MURRILL \& VANN, \textit{supra} note 62, at 6–8.
  \item \textsuperscript{75} See \textit{ supra} Part II.A.
  \item \textsuperscript{76} See \textit{Ground Water Prot. Council \& ALL Consulting, supra} note 3, at 61.
  \item \textsuperscript{77} See \textit{id.} at 62.
  \item \textsuperscript{78} \textit{Id.}
\end{itemize}
the chemical constituents that make up each additive. The regulations, however, differ in one very significant respect: some require disclosure of only those chemical constituents that are classified as “hazardous” under the Occupational Safety and Health Administration regulations (“OSHA-level disclosure”), while others require full disclosure of all chemical constituents, regardless of whether they are classified as “hazardous.”

OSHA-level disclosure refers to the disclosure of only those “hazardous” chemical constituents that OSHA requires to be reported on material safety data sheets (MSDS). The OSHA regulations classify a chemical as “hazardous” if it presents a physical or health hazard. The OSHA regulations further define a chemical as presenting a “health hazard” if “there is statistically significant evidence based on at least one study . . . that acute or chronic health effects may occur” if employees are exposed to the chemical. However, if a particular chemical has not been the subject of a scientific study into its potential adverse effects, the chemical will not be classified as “hazardous” and, therefore, will not be subject to disclosure under a standard requiring OSHA-level disclosure.

OSHA requires that any chemical constituent contained in an additive that is known to be a health hazard be listed on the MSDS if it makes up more than one percent of the additive. However, if the chemical constituent has been identified as a carcinogen, it must be listed on the MSDS if it composes more than 0.1% of the additive. Thus, whenever a regulation requires the disclosure of all chemical constituents that must be disclosed on the MSDS, the operator or service company will disclose only the names of those chemical

80. See, e.g., LA. ADMIN. CODE tit. 43, § 118(C)(4) (2011); ARK. OIL & GAS COMM’N, supra note 21, at r. B-19(l)(3)(C).
81. MURRILL & VANN, supra note 62, at 7.
82. 29 C.F.R. § 1910.1200(c) (2010).
83. Id.
86. Id.
constituents that are listed as “hazardous” under the foregoing criteria.\textsuperscript{87}

“Full disclosure,” by contrast, would require the disclosure of all the chemical constituents contained in the Frac Fluid, regardless of whether they meet OSHA’s definition of “hazardous.” While this full-disclosure regime is the approach that environmental groups and a concerned public are calling for,\textsuperscript{88} the service companies and the suppliers of the additives are concerned that this level of disclosure will require them to reveal trade secrets, which could have a severely negative impact on their business.\textsuperscript{89}

\textbf{b. Critique of state law:}

\textit{Louisiana, Pennsylvania, Arkansas, and Texas}

A number of existing state disclosure regulations require operators and service companies to disclose the additives used in Frac Fluids.\textsuperscript{90} While type of disclosure is important in identifying the different purposes these additives serve in the hydraulic fracturing process, it does not provide any insight on the potential environmental and health impacts of the chemical constituents that make up each additive.\textsuperscript{91} To provide meaningful information about the potential environmental and health hazards associated with Frac Fluids, states should take disclosure to the next level: the chemical constituent level.

As stated above,\textsuperscript{92} there are two different approaches to disclosure of chemical constituents: OSHA-level disclosure and full disclosure. Louisiana and Pennsylvania, with regulations passed in 2011, require disclosure of Frac Fluid composition down to the chemical constituent level, but they require disclosure of only those chemicals that must be disclosed on an MSDS under OSHA regulations (i.e., “hazardous chemicals” only).\textsuperscript{93} While some believe

\begin{itemize}
  \item \textsuperscript{87} MURRILL & VANN, supra note 62, at 7.
  \item \textsuperscript{88} See Boling, supra note 64.
  \item \textsuperscript{89} Id.
  \item \textsuperscript{90} See e.g., LA. ADMIN. CODE tit. 43, § 118(C)(2) (2011); 25 PA. CODE § 78.122(b)(6)(i) (2011); ARK. OIL & GAS COMM’N, supra note 21, at r. B-19(I)(3)(B) (2011); WYO. OIL & GAS CONSERVATION COMM’N, supra note 20, at Ch. 3 § 45(d)(i) (2010).
  \item \textsuperscript{91} Boling, supra note 64.
  \item \textsuperscript{92} See supra Part III.B.1.
  \item \textsuperscript{93} See LA. ADMIN. CODE tit. 43, § 118(C)(2); 25 PA. CODE § 78.122(b)(6).
\end{itemize}
a disclosure regime that is limited to hazardous chemicals is sufficient, many others believe that utilizing a standard designed for workplace safety is inadequate and unacceptable.94

In addition, OSHA’s definition of “hazardous” encompasses only those chemicals for which at least one study shows that exposure to such chemicals may result in “acute or chronic health effects [] in exposed employees.”95 This definition has led many to question whether all of the possible hazardous chemicals have been identified under the OSHA criteria.96 Some in the Industry assert that chemical manufacturers evaluate every product they sell, so if a product is not on the MSDS provided by the supplier, it is not hazardous to humans or the environment.97 However, Michael Wilson, director of the Labor Occupational Health Program at the University of California–Berkeley, claims that of the “more than 80,000 chemicals registered for commercial use with the EPA . . . there is enough research to identify potential hazards for less than two percent of them.”98

Arkansas, Texas, and, more recently, Colorado, each mandate full disclosure of all chemical constituents contained in any Frac Fluid used in their states.99 Arkansas’s version of “full disclosure” differs from Texas’s and Colorado’s in one material respect: Arkansas requires service companies to fully disclose all chemical constituents that might be used for hydraulic fracturing on a master list before they are authorized to conduct hydraulic fracturing operations in the state.100 Since the service companies do not know what combination of additives—and the chemical constituents that compose them—will be used for a given well prior to the fracturing

94. See McFeeley, supra note 84, at 10.
96. McFeeley, supra note 84, at 10.
98. Id.
100. ARK. OIL & GAS COMM’N, supra note 21, at r. B-19(l)(3)(C).
treatment, the master list provides the state with an advanced awareness of the chemicals that may be used.\textsuperscript{101}

The second type of full disclosure in Arkansas is the only type of disclosure currently in place in Texas and Colorado: well-by-well disclosure of all chemical constituents contained in the Frac Fluid.\textsuperscript{102} In other words, after a given hydraulic fracturing treatment, the operator or service company will provide a list of the chemical constituents used in that specific well’s Frac Fluid.\textsuperscript{103} Here, although the effect of both provisions is the same, the language used in Arkansas is more concise. Arkansas’s Rule B-19 calls for “[a]ll Chemical Constituents and associated CAS numbers utilized during the Hydraulic Fracturing Treatment.”\textsuperscript{104} Texas’s full disclosure provision, on the other hand, reads:

\begin{quote}
(E) in addition to the completed form specified in Paragraph (D), provide to the commission a list, to be made available on a publicly accessible website, of all other chemical ingredients not listed on the completed form that were intentionally included and used for the purpose of creating a hydraulic fracturing treatment for the well.\textsuperscript{105}
\end{quote}

Paragraph (D), referenced above, refers to the operator’s obligation to disclose all MSDS (“hazardous”) chemicals on the Ground Water Protection Council’s FracFocus website.\textsuperscript{106} Not only is the language somewhat convoluted, but it also ties the substantive requirements of disclosure to a form that may be modified at any time.\textsuperscript{107} Thus, the meaning of this provision would change if the requirements for the FracFocus disclosure form were to change.

Texas also addresses the concern raised by the Industry that requiring full disclosure of all chemical constituents contained in the Frac Fluid could be construed to require the disclosure of trace

\textsuperscript{101} McFeeley, supra note 84, at 8.
\textsuperscript{102} Ark. Oil & Gas Comm’n, supra note 21, at r. B-19(1)(4)(C).
\textsuperscript{103} McFeeley, supra note 84, at 10–11.
\textsuperscript{104} Ark. Oil & Gas Comm’n, supra note 21, at r. B-19(1)(4)(C).
\textsuperscript{106} FracFocus is a voluntary, online chemical registry created by the Ground Water Protection Council where operators and service companies post the chemicals used for a given well for the public. FracFocus Chemical Disclosure Registry, FracFocus, http://fracfocus.org/welcome (last visited Jan. 3, 2012).
\textsuperscript{107} Boling, supra note 64.
amounts of chemicals that are found in the water that is used along with the “proppant.” To diminish this concern, the operator, service company, or supplier is not responsible for disclosing ingredients that are “not purposely added to the hydraulic fracturing treatment,” or which “occur incidentally or are otherwise unintentionally present in the treatment.” The advantage of this provision is that the Industry will give the public full disclosure in exchange for protection from liability for any unintentional inclusion of chemical constituents in the Frac Fluid.

2. Concentration Information

   a. Overview of the law

Concentration information is yet another important aspect of an effective disclosure regime. This aspect of disclosure can ensure truly full disclosure of all chemical constituents contained in a Frac Fluid, but if this provision is not structured properly, it can give the service companies a justifiable reason to withhold the identity of chemical constituents based on a claim of trade-secret protection. As was true in the discussion of full disclosure above, the subtle differences in how concentration information is reported may make the difference between a successful and unsuccessful regulation. To the disclosing party, there are drastically different consequences associated with disclosing the percentage chemical concentration of each additive, as opposed to disclosing the chemical concentration percentage of the total Frac Fluid.

Before discussing the differences that arise from these two different disclosure methods, it is important to note why reporting chemical concentration percentages is necessary. All Frac Fluids contain chemical constituents that are “hazardous” in large enough

108. Boling, supra note 64.
110. Id. at § 91.851(a)(1)(E)(ii).
111. Boling, supra note 64.
112. Edwards et al., supra note 19.
113. See supra Part III.B.1.
115. Id.
quantities. However, these hazardous chemicals compose only a very small fraction of the entire Frac Fluid. Thus, disclosing chemical concentration percentages gives the public a better understanding of how much of a given chemical will be pumped underground, provides some context for how dangerous the Frac Fluid is, and allows researchers to focus on the fluid’s most highly concentrated chemicals when they evaluate a Frac Fluid’s health and environmental risks.

All of the current regulations have some requirement to provide percentage-composition information for the chemicals contained in the Frac Fluid. The difference is whether the regulation requires the concentration information to be tied to each additive or to the Frac Fluid as a whole. Many of the states with regulations in place have chosen an additive-by-additive approach. In other words, the operator is required to disclose the percentage amount of each chemical present in each of the additives in the Frac Fluid. In practice, this means that service companies and suppliers have to divulge their “recipe” for every additive to the public and, more importantly, their competitors. Service companies such as Halliburton have expressed concern that this level of disclosure threatens their trade secrets by potentially allowing competitors to reverse engineer their proprietary formulas. The unintended result of an additive-by-additive reporting requirement is less disclosure, since service companies and suppliers increasingly attempt to avoid revealing their proprietary additive formulas by claiming potential trade secret infringement. However, certain legislators,

116. See GROUND WATER PROT. COUNCIL & ALL CONSULTING, supra note 3, at 62.
117. Id. at 61.
118. Boling, supra, note 64.
120. Boling, supra, note 114.
121. See, e.g., WYO. OIL & GAS CONSERVATION COMM’N, supra note 20.
122. Boling, supra, note 114.
124. Boling, supra note 114.
environmental groups, and natural gas companies have worked together to devise a way to obtain full disclosure and eliminate the threat of reverse engineering by requiring the concentration of each chemical constituent to be expressed as a percentage of the Frac Fluid as a whole.126

Providing the percentage composition of each chemical constituent contained in the entire Frac Fluid provides the same level of disclosure as an additive-by-additive based system, but it does not tie chemical constituents to particular additives.127 Instead, as the name implies, chemical concentrations are given as a mass percentage of the total Frac Fluid.128 Doing so eliminates the potential for reverse engineering a company’s proprietary additive formula.129 As a result, this approach would support the overall goal of full disclosure by taking away the Industry’s main reason for seeking trade-secret protection.

b. Critique of state law: Wyoming and Texas

Chemical constituent concentrations play a substantial role in resolving the Frac Fluid disclosure issue. Not only does concentration information reveal how much of a certain chemical constituent will be pumped underground, but if compiled correctly, it can also further the goal of full disclosure discussed above.130

Wyoming’s Frac Fluid disclosure regulation131 illustrates the additive-based method of reporting concentration information. This is evident from the plain language of the statute:

(d) . . . The Owner or Operator or service company shall provide to the Supervisor . . . the chemical additives, compounds and concentrations or rates proposed to be mixed and injected, including: . . .
(ii) The chemical compound name and Chemical Abstracts Service (CAS) number shall be identified (such as the additive biocide is glutaraldehyde, or the additive breaker is aluminum persulfate, or the proppant is silica or quartz sand, and so on for each additive used).  

As discussed above, an additive-based method of reporting the concentrations of chemical constituents has significant drawbacks. Service companies derive their competitive advantage from developing effective additive formulas. These formulas take both time and capital to develop. The additive-based system essentially requires service companies to divulge their proprietary formula to the public. As a result, the identity or concentration of more chemical constituents will be withheld as trade secrets, and the goal of full disclosure will not be achieved.

Wyoming courts have seen numerous trade-secret claims based on the additive-based concentration requirement and have routinely granted them. Within the first year of passing its Frac Fluid disclosure regulations, Wyoming deemed 146 chemicals trade secrets. Appendix 1 demonstrates how this would appear on a Frac Fluid public registry. Each chemical marked “SECRET” represents a successful claim of trade secrecy. Although concentration information is provided, the chemical’s abstract service (CAS) number is not. A CAS number is a unique identifying number for all known chemicals, including the chemical constituents used in Frac Fluids, and provides both researchers and the public with a way to identify each chemical constituent specifically. Without the CAS number, the public is denied full disclosure. Such a lack of information undermines the regulation’s purpose and fails to resolve effectively the Frac Fluid disclosure issue.

132. Id. § 45(d)(ii).
133. See supra Part III.B.2.a.
134. See Edwards et al., supra note 19, at 4.
135. Id.
136. Boling, supra note 114.
137. See Fugleberg, supra note 125.
138. See Fugleberg, supra note 125.
139. See infra app. 1.
140. See McFEELEY, supra note 84, at 10.
141. Boling, supra note 64.
The system-based approach for reporting chemical constituent concentrations can be found in the Texas\textsuperscript{142} and Colorado\textsuperscript{143} disclosure regulations. In Texas, this approach is codified in a statutory provision: “The commission rule shall \textit{not require that the \textit{[chemical constituents]} be identified based on the additive in which they are found} or that the concentration of such \textit{[chemical constituents]} be provided.”\textsuperscript{144}

The subtly different language of Texas’s regulation, compared to Wyoming’s, significantly changes the amount of information that is ultimately disclosed.\textsuperscript{145} The system-based approach protects the service company’s proprietary additive formulas without the necessity of asserting trade-secret protection.\textsuperscript{146} In the end, this small change gets the public closer to the ultimate goal of full disclosure.

Appendix 2\textsuperscript{147} illustrates how this change in reporting the concentrations of chemical constituents would appear on a public registry. The most significant difference is in removing the column in Appendix 1 labeled, “Ingredient Concentration in Additive.” That column represents the difference between the Wyoming and Texas regulations. The system-based report still provides the percentage concentrations of all chemical constituents present in the Frac Fluid and lists all of the corresponding CAS numbers. Thus, to achieve the goal of public trust and acceptance of hydraulic fracturing practices, the full disclosure provided by a system-based approach to chemical constituent concentrations is superior to Wyoming’s additive-based system.\textsuperscript{148}

3. Trade-Secret Protection

\textit{a. Overview of the law}

An effective trade-secrets provision is yet another vital aspect of a successful Frac Fluid disclosure regime.\textsuperscript{149} Legislators must find a
way to balance the interests of the public and environmental groups calling for full disclosure with those of the service companies and additive suppliers who desire to protect their proprietary formulas. While full disclosure is seemingly undermined by trade-secret protection, service companies often spend millions of dollars on research and development for a given formula.150 Thus, to protect their investment and the competitive advantage that stems from it, such companies must be afforded trade-secret protection if they can substantiate their claims.151

Most states have regulations in place that protect legitimate trade secrets from being disclosed in publicly available filings with state agencies.152 These regulations often contain the processes and procedures for companies to claim trade-secret protection.153 However, some states have looked to federal standards and procedures, such as those employed by OSHA154 or the Emergency Planning and Community Right-to-Know Act (EPCRA),155 to deal with the trade-secret protection issue. Both OSHA and EPCRA use the same definition of what constitutes a trade secret,156 but they differ significantly in how a trade-secret claimant substantiates the legitimacy of its claim. OSHA allows the claimant to withhold the identity of a chemical constituent if “[t]he claim that the information withheld is a trade-secret can be supported”157 by the claimant. Importantly, the OSHA regulations require that the properties and effects of any hazardous chemical claimed as a trade secret be disclosed by the operator on the MSDS for such chemicals.158 In addition, the claimant must provide the identity of any chemical

150. Edwards et al., supra note 19, at 4.
151. MC Feeley, supra note 84, at 6.
153. See 25 PA. CODE § 78.122(c); Wyo. Oil & Gas Conservation Comm’n, supra note 20.
156. Restatement of Torts § 757 cmt. b (1939) (“[A]ny formula, pattern, device or compilation of information which is used in one’s business, and which gives him an opportunity to obtain an advantage over competitors who do not know or use it.”)
158. Id. § 1910.1200(i)(1)(ii).
constituent claimed as a trade secret to medical responders in the case of an emergency. Unfortunately, the OSHA regulations provide no guidance as to what a trade-secret claimant must show to “support” its trade-secret claim.

EPCRA, on the other hand, lays out detailed procedures that must be followed in order for a claimant to assert and substantiate its claim of trade secrecy. These procedures are set out in Subsection (a)(2) of EPCRA. This provision requires a trade-secret claimant to submit supporting documentation that will satisfy statutorily enumerated factors designed to substantiate the validity of the trade-secret claim. Unless the claimant adequately supports each of the factors, the trade-secret claim will not be granted. These factors are (1) whether the claimant disclosed the information to other parties, (2) whether state or federal law mandates disclosure of the information, (3) whether disclosure would cause substantial harm to the claimant’s competitive position, and (4) whether the identity of the chemical may be discerned through reverse engineering. Thus, unlike OSHA, EPCRA requires the trade-secret claimant to provide specific information to substantiate its trade-secret claim before trade-secret status is granted.

b. Critique of state law:
Wyoming and Arkansas

While successful trade-secret claims limit disclosure, the public’s desire for full disclosure must be weighed against the Industry’s legitimate claims for keeping proprietary chemical formulas secret. The key difference between successful and unsuccessful trade-secret provisions lies in how the claimant must substantiate his or her claim. Many state disclosure regulations reference the states’ own public records acts. Wyoming’s regulation, for example, requires the claimant to “justify[] and document[] the nature and extent of the proprietary

159. Id. § 1910.1200(i)(2).
161. See id. § 11042(b).
162. Id. §§ 11042(b)(1)–(4).
163. McFeeley, supra note 84, at 6.
164. See 25 PA. CODE § 78.122(d) (2011); Wyo. Oil & Gas Conservation Comm’n, supra note 20.
If state regulators find a claim to be sufficient, the chemical identity will be held as a trade secret under the Wyoming Public Records Act. The problem with this provision is that it does not provide the public with any indication as to how a claimant’s justifications are reviewed and approved. The reference included in the regulation to the Wyoming Public Records Act simply identifies trade secrets as excluded from the public record. From a plain reading of the regulation, it appears that Wyoming state regulators are given discretion to decide whether to grant trade-secret protection. This lack of guidance leaves the public without a means to interpret Wyoming’s decisions to approve or deny trade-secret claims.

Arkansas implemented a different approach to substantiating trade-secret claims in its Frac Fluid disclosure regulation. Instead of referencing an existing state law, Arkansas requires the claimant to meet the trade secret criteria set forth in EPCRA. As discussed above, EPCRA imposes a significant obligation on the claimant in substantiating a trade-secret claim. The first major benefit of Arkansas’s incorporation of EPCRA is that EPCRA’s heightened requirements serve as a screening process. Under Arkansas’s disclosure regime, fewer chemicals will be granted trade-secret protection. In the end, EPCRA’s criteria for substantiating a trade-secret claim benefit both the public, through more complete disclosure, and the Industry, by protecting its companies’ legitimate proprietary interests.

Another advantage to Arkansas’s trade-secret provision is public transparency. Unlike Wyoming, Arkansas provides the public with the criteria used in adjudicating a trade-secret claim. Thus, if a claimant successfully obtains trade-secret protection, the public will

165. See WYO. OIL & GAS CONSERVATION COMM’N, supra note 20.
166. Id.
167. See WYO. STAT. ANN. § 16-4-203(d)(v) (2010).
168. Id.
170. See supra Part III.B.1.
171. Boling, supra note 64.
172. Id.
173. Id.
174. See ARK. OIL & GAS COMM’N, supra note 21 (referencing the EPCRA criteria in 42 U.S.C. § 11042(b)).
be aware of how and why it was obtained.\textsuperscript{175} Overall, the EPCRA criteria mitigate public doubt and confusion about the process of acquiring trade-secret protection.\textsuperscript{176}

\textbf{C. To Whom Are They Required to Disclose?}

1. Overview of the Law

Finally, all disclosure regulations provide varying degrees of guidance as to how and to whom the information concerning the chemical composition of the Frac Fluid must be disclosed.\textsuperscript{177} Taking current state regulations as a whole, operators have been required to disclose to any combination of three groups: the state regulatory agency, the public, and emergency responders.\textsuperscript{178}

2. State Law Critique: Wyoming and Texas

The regulation passed in Wyoming requires the operator to disclose the required Frac Fluid information to the state governmental entity and the public.\textsuperscript{179} The Supervisor of the Wyoming Oil and Gas Conservation Commission receives the list of chemical constituents used in a given hydraulic fracturing treatment in the well completion report.\textsuperscript{180} The well completion report is prepared after the treatment has taken place and includes the actual amount of chemicals used on a given well.\textsuperscript{181} The same well completion report is made available to the public on the Wyoming Oil and Gas Conservation Commission’s website.\textsuperscript{182} However, Wyoming’s regulation does not mention any sort of public

\textsuperscript{175} Boling, supra note 114.
\textsuperscript{176} Boling, supra note 64.
\textsuperscript{177} MURRILL & VAN, supra note 62, at 9.
\textsuperscript{178} Id. at 4, 9.
\textsuperscript{179} WYO. OIL & GAS CONSERVATION COMM’N, supra note 20.
\textsuperscript{180} Id.
\textsuperscript{181} Id.
Texas remedied this and other problems in their disclosure regulation.\footnote{183} Texas’s disclosure regulation is more thorough. Like other states, Texas requires the well operator to supply the state commission with a list of all chemical constituents used in the hydraulic fracturing treatment, and to make the list of chemical constituents available to the public.\footnote{185} However, unlike Wyoming’s regulation, the Texas regulation specifies a central repository, FracFocus,\footnote{186} in which the information is collected.\footnote{187} Not only does this give Texas residents an idea of where to find disclosure information, but it also represents a step toward making FracFocus a nationally recognized chemical registry.\footnote{188} The public would benefit significantly from the ease of having one website from which it could obtain disclosure information for the entire country.\footnote{189}

Finally, what separates Texas’s disclosure regime from those of many other states is its emergency-responder provision. Under this provision, Texas requires operators, service companies, and suppliers to provide information about chemical constituents—including those that have been deemed trade secrets—to any health professional or emergency responder who might need the information to treat a patient exposed to such chemicals.\footnote{190} The effect of this requirement is significant. In the event of a chemical spill during a hydraulic fracturing treatment, emergency responders will be able to provide more effective treatment by obtaining information about the chemicals the individual may have come into contact with.\footnote{191}

\section*{IV. PROPOSED “MODEL” REGULATORY FRAMEWORK}

The analysis above illustrates how states have confronted the Frac Fluid disclosure issue. As this Note goes to print, seventeen
states have rules in place to regulate disclosure.\textsuperscript{192} While the ultimate goals of these regulations are similar, their approaches differ significantly. Not only do these differences pose a procedural burden for operators conducting business in multiple states, but they also result in deficiencies that could be avoided by examining successful strategies already implemented in other states.

In an attempt to resolve these issues, this part sets forth concepts for a “model” regulatory framework that strikes a balance between “full disclosure” and protection of legitimate trade secrets. This model regulation could be used to assist states in drafting more uniform and effective Frac Fluid disclosure regulations. The easiest way to delineate the requirements of an effective model regulation is to use the same three criteria that were used above to assess the effectiveness of existing Frac Fluid disclosure regimes: (1) who is required to disclose information; (2) what information they are required to disclose; and (3) to whom they must disclose that information.

\textit{A. The Affirmative Obligation: Requiring All Parties to Disclose}

Beginning with who is required to disclose, the approach taken by Arkansas\textsuperscript{193} and Texas\textsuperscript{194} is most effective.\textsuperscript{195} In essence, every party involved in a hydraulic fracturing treatment—the operator, service company, and supplier—has an obligation to disclose the information they have in their possession.\textsuperscript{196} As Texas and Arkansas demonstrate, this can be achieved by imposing the primary disclosure obligation on the operator with a corresponding obligation on the part of the service company and supplier to provide the

\begin{flushright}
\begin{footnotesize}
\textsuperscript{193} ARK. OIL & GAS COMM’N, supra note 21, at r. B-19(k)(8).
\textsuperscript{194} TEX. NAT. RES. CODE ANN. § 91.851(a)(2) (West 2011).
\textsuperscript{195} Boling, supra note 114.
\textsuperscript{196} See TEX. NAT. RES. CODE ANN. § 91.851(a)(2) (West 2011); ARK. OIL & GAS COMM’N, supra note 21, at r. B-19(l)(4).
\end{footnotesize}
\end{flushright}
operator with the requisite information to allow the operator to fulfill its disclosure obligation. Expressing the disclosure obligation in this manner clearly identifies each party’s role in the disclosure process and eliminates the possibility of a gap in the information that is disclosed.

Another important advantage to this type of disclosure scheme is that it is the most cost effective way for state agencies to implement the new disclosure requirement.\(^{197}\) This is because the operator already has the obligation to file a well completion report with the state after every hydraulic fracturing treatment.\(^{198}\) Simply requiring the operator to include the Frac Fluid disclosure as an appendix to this report would significantly reduce the cost and administrative burden of transitioning to the new disclosure regulation.\(^{199}\) Ultimately, the presence of a clearly defined disclosure obligation for operators, services companies, and suppliers would significantly contribute to the overall effectiveness of a Frac Fluid disclosure regulation.

**B. Achieving Full Disclosure**

*Through a System-Based Concentration Requirement and EPCRA’s Trade Secret Criteria*

The next category for assessing the effectiveness of the model disclosure regulation is “what information must be disclosed.” As described above, three subcategories of disclosure must be addressed in order to properly evaluate this criterion: the level of disclosure, the disclosure of concentration information, and the treatment of trade secrets. Arkansas’s Rule B-19 lays out the approach to the level of disclosure\(^{200}\) that the model regulation requires. First, as is consistent with the ultimate goal of Frac Fluid disclosure, the information disclosed reflects “full disclosure” of all chemical constituents contained in the Frac Fluid, together with CAS numbers for all such chemical constituents. Unlike the many states that simply require OSHA-level disclosure, the model regulation mandates disclosure of all chemicals, regardless of whether they are classified as

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198. Id.
199. Id.
“hazardous” under OSHA. Further, the model regulation includes Arkansas’s concept of having a master list of Frac Fluid chemicals on file with the state agency. With this information in the state’s possession before any actual hydraulic fracturing treatments are done, the potential risk of adverse health and environmental effects will be known in advance and effective mitigation efforts can be implemented.

Second, the model regulation requires concentration information on a “Frac Fluid system” basis like that found in Texas.201 As discussed above, under this approach, the operator would be required to disclose the concentrations of all chemical constituents included in a particular Frac Fluid as a percentage by mass of the total Frac Fluid. By disclosing concentration information in this manner, the regulation will work toward the ultimate goal of “full disclosure,” while at the same time ensuring that proprietary additive formulas are kept secret.

Finally, the manner in which the state handles trade-secret claims can significantly affect how successful a regulation will be in achieving “full disclosure.”202 Too lax of a standard may result in an increased number of trade-secret claims, many of which are not legitimate. Too strict of a standard, in contrast, may put service companies and suppliers in the difficult position of either foregoing work in a particular state or conducting work there at the risk of disclosing its legitimate trade secrets. It is suggested that Arkansas’s use of EPCRA’s criteria for substantiating trade-secret claims203 falls in the middle of these two extremes204 and is thus what the model regulation requires. The EPCRA criteria for supporting trade-secret claims205 provide service companies, suppliers, and the public with an understanding of how trade-secret claims are approved or denied.206 They also provide clear guidance to potential trade-secret claimants as to what must be proven to substantiate legitimate trade-secret claims.207

203. ARK. OIL & GAS COMM’N, supra note 21, at r. B-19(k)(8).
204. Boling, supra note 114.
206. Id.
207. Id.
The final criterion for the model regulation is “to whom must the information be disclosed.” To achieve full disclosure, the model regulation requires disclosure to all interested parties: the regulatory agencies, the emergency responders, and the public. Texas’s regulation reflects the approach proposed by the model regulation with regard to all three groups. First, as every current state regulation requires, the disclosure information must be provided to the state regulatory agency. What sets Texas and the model regulation apart from the majority of the other states with regulations in place is the emergency-responder provision, and how information is disclosed to the public.

An emergency-responder provision ensures that the health and safety of persons handling or otherwise exposed to Frac Fluids will not be jeopardized by trade-secret claims. In the case of a chemical spill during a hydraulic fracturing operation, the operator is required to disclose to emergency responders the identity of all chemical constituents contained in the Frac Fluid (including their corresponding CAS number), regardless of whether any such chemical constituent is entitled to trade-secret protection. Any such disclosure that reveals legitimate trade secrets will require that the emergency responder sign a confidentiality agreement to ensure that any proprietary chemical information that is disclosed is kept secret. In the end, this emergency-responder provision protects both the health of persons exposed to Frac Fluid chemicals and the legitimate trade secrets of the service company or supplier.

Finally, under the “model” regulation, all Frac Fluid disclosure information is disseminated to the public. Much of the recent

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208. Boling, supra note 114.
213. MCFEELEY, supra note 84, at 13.
214. Boling, supra note 114.
attention to hydraulic fracturing is based upon the public’s belief that
the natural gas industry is trying to hide the truth about the safety of
hydraulic fracturing.\textsuperscript{215} Thus, an effective means of disclosing
information to the public is crucial for any Frac Fluid disclosure
regulation. The model regulation follows the Texas disclosure
regulation by requiring public disclosure of all Frac Fluid
information on the publicly accessible website FracFocus, a Frac
Fluid chemical registry maintained by the Ground Water Protection
Council. FracFocus facilitates disclosure to the public by serving as a
central repository for all Frac Fluid disclosure information.\textsuperscript{216} Instead
of having to search for the information on individual state agency
websites, the public would be able to obtain nationwide data in one
place. In addition, recently proposed changes to the FracFocus site
will make searching for and compiling information easier to
accomplish.\textsuperscript{217}

The above-described provisions of the “model” regulation all
work toward the same goal: providing the most robust disclosure
regime for the chemicals contained in Frac Fluids without
endangering the legitimate trade secrets of those companies that
provide the additives that make up the Frac Fluid. The provisions
contained in the model regulation, by comparison with many current
Frac Fluid disclosure regulations, are the most effective way to
achieve this goal.\textsuperscript{218}

V. CONCLUSION

On January 25, 2012, in his State of the Union address,
President Obama stated:

We have a supply of natural gas that can last America
nearly one hundred years. And my administration will take
every possible action to safely develop this energy. Experts

\textsuperscript{215} \textit{Id.}

\textsuperscript{216} \textit{Id.}

\textsuperscript{217} \textit{GIS Coming to FracFocus}, FRACFOCUS, http://fracfocus.org/node/315 (last visited

\textsuperscript{218} After the completion of this Note, Colorado passed a disclosure regulation that contains
many of the suggestions found in the model regulation. \textit{See} COLO. CODE REGS. § 404-1:205A
(2012); Mark Jaffe, \textit{Colorado Approval of Fracking Fluids’ Full Disclosure Came After Long
believe this will support more than 600,000 jobs by the end of the decade. And I’m requiring all companies that drill for gas on public lands to disclose the chemicals they use. Because America will develop this resource without putting the health and safety of our citizens at risk.\textsuperscript{219}

The President’s statements reflect why an effective Frac Fluid disclosure regime is so important for our nation. The United States is in a position to capitalize on a vast supply of domestic natural gas that will enable us to regain our energy independence, create much-needed jobs for Americans, and develop a low-carbon energy source that burns significantly cleaner than coal and oil.\textsuperscript{220} The model regulation disclosure regulation serves to provide states guidance in drafting effective Frac Fluid disclosure regulations. The suggestions set forth in the model regulation are designed to achieve the goal of “full disclosure” of Frac Fluid chemicals in a manner that satisfies regulators, the natural gas industry, and environmentalists. While this may seem like an impossible task, with so much at stake for our country, failure is not an option.


## APPENDIX 1

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<thead>
<tr>
<th>Trade Name</th>
<th>Supplier</th>
<th>Purpose</th>
<th>Ingredients</th>
<th>CAS #</th>
<th>Ingredient Concentration in Additive (% by mass)</th>
<th>Ingredient Concentration in HF Fluid (% by mass)</th>
</tr>
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<tr>
<td>YP355</td>
<td>ABC Corp.</td>
<td>Propping agent, Gelling agent, Surfactant Clay stabilizer</td>
<td>Water</td>
<td>-</td>
<td>-</td>
<td>79.98%</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Crystalline silica</td>
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<td>97.03%</td>
<td>19.42%</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Ether Salt</td>
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<td>0.470%</td>
<td>0.094%</td>
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<td></td>
<td></td>
<td></td>
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<td>0.201%</td>
<td>0.040%</td>
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<td>0.026%</td>
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<td></td>
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<td>Methanol</td>
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<td></td>
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<td>0.012%</td>
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<td></td>
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<td></td>
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<td></td>
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## APPENDIX 2

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<tr>
<th>Trade Name</th>
<th>Supplier</th>
<th>Purpose</th>
<th>Ingredients</th>
<th>CAS #</th>
<th>Concentration in HF Fluid (% by mass)</th>
</tr>
</thead>
<tbody>
<tr>
<td>YP355 MpH</td>
<td>ABC Corp.</td>
<td>Propping agent, Gelling agent, Foamer, Clay stabilizer</td>
<td>Water</td>
<td>-</td>
<td>79.98%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Crystalline silica</td>
<td>14808-34</td>
<td>19.41%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Guar gum</td>
<td>90000-30-4</td>
<td>0.30%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sodium sulphate</td>
<td>2544-234</td>
<td>0.094%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Diammonium peroxidisulphate</td>
<td>7727-898</td>
<td>0.04%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sodium chloride</td>
<td>09998-3</td>
<td>0.034%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Magnesium chloride</td>
<td>67-56-1</td>
<td>0.033%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Propan-2-ol</td>
<td>63-213</td>
<td>0.026%</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>Methanol</td>
<td>14807-43</td>
<td>0.025%</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>Ethoxylated alcohols</td>
<td>8794-312</td>
<td>0.012%</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>Ethoxylated alcohols #2</td>
<td>10043-43</td>
<td>0.008%</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>Acetic acid</td>
<td>15556-4</td>
<td>0.005%</td>
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<tr>
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<td>Calcium chloride</td>
<td>90002-222</td>
<td>0.004%</td>
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<tr>
<td></td>
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<td></td>
<td>Potassium chloride</td>
<td>64-19-744</td>
<td>0.0008%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cationic polymer</td>
<td>3948-39-39</td>
<td>0.0008%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Magnesium silicate hydrate</td>
<td>29385-44</td>
<td>0.0001%</td>
</tr>
</tbody>
</table>