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EPA Launches Hydraulic Fracturing Study to Investigate Health and Environmental Concerns While North Dakota Resists Regulation: Should Citizens be Concerned?

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This Article was written in early 2011 and presented by the author at the North Dakota Law Review Energy Law Symposium on November 3, 2011. On November 9, 2011, the State of North Dakota introduced new oil and gas rules, which incorporated many of the regulatory changes the author proposed in this article.[1] The final rules were approved and went into effect April 1, 2012. Highlights of these regulatory changes include: increased bond requirements, heightened drill pit regulations, tougher hydraulic fracturing regulations, and chemical disclosure requirements for hydraulic fracturing fluids.[2] These rule changes are a step towards ensuring the oil and gas industry remains stewards to the land and accountable to the people of North Dakota. While many of the arguments in this Article have now been preempted by the regulatory action, the Article provides valuable background and insight into the importance of heightened regulation and the considerations weighed by the legislators during the development and implementation of these regulations.

EPA LAUNCHES HYDRAULIC FRACTURING STUDY TO INVESTIGATE HEALTH AND ENVIRONMENTAL CONCERNS WHILE NORTH DAKOTA RESISTS REGULATION: SHOULD CITIZENS BE CONCERNED?

ABSTRACT

In response to concerns of contaminated drinking water supplies near hydraulic fracturing (fracking) sites, the U.S. House of Representatives Appropriation Conference Committee identified a need for scientific study of fracking[3] operations. At the direction of Congress, the Environmental

1. *See* DEPT. OF MINERAL RES., OIL AND GAS DIV., PROPOSED 2012 RULE CHANGES, *available at* https://www.dmr nd.gov/oilgas/rules2012changes.pdf; *see also* North Dakota Proposes New Rules on Hydraulic Fracturing, https://fracfocus.org/node/326.

2. DEPT. OF MINERAL RES., OIL AND GAS DIV., FINAL 2012 OIL AND GAS RULES, *available at* https://www.dmr nd.gov/oilgas/rules/rulebook.pdf; N.D. CENT. CODE §§ 38-08.1-02, 38-08.1-05, 38-08-07 (2004); ND CENT. CODE §§ 38-08-04, 38-08-08 (Supp. 2011).

3. "Fracking" or "fracing" is an industry term referring specifically to the process of hydraulic fracturing, a secondary recovery method used to increase production from oil and gas wells. During a "frac job" pressurized water, industrial additives, and sand are blasted down well to fracture or break open rock formations that trap oil or gas. *See* Philippe A. Charlez, Rock Mechanics: Petroleum Applications 239 (1997). For the purposes of this Article and the North Dakota Law Review, the term fracking may be substituted as interchangeable terms. *See, e.g.,* Armes v. Petro-Hunt, LLC, 4:10-CV-078, 2012 WL 1493740 at *1 (D.N.D. Apr. 27, 2012);

Protection Agency (EPA) launched a 1.9 million dollar study to investigate fracking's impact on drinking water and groundwater. In response to the study, the North Dakota Industrial Commission (NDIC) encouraged North Dakota residents to support the oil and gas industry by submitting a formal complaint to the EPA, urging it to discontinue the study. State lawmakers backed the NDIC request by unanimously approving a bill that declared fracking an acceptable recovery process in North Dakota. This note will compare and contrast North Dakota's oil and gas regulations with those of other oil rich states, arguing North Dakota's regulations have failed to evolve in response to increased drilling activity and concluding North Dakota's regulations require modernization to ensure the risk of groundwater contamination is mitigated.

Weatherford Int'l, Inc. v. Peak Completion Tech., Inc., CIV.A. H-08-1450, 2011 WL 819324 at *4 (S.D. Tex. Mar. 2, 2011); Parcoil Corp. v. NOWSCO Well Serv., Ltd., 887 F.2d 502, 503 (4th Cir. 1989).

I. INTRODUCTION

Historically, the United States enjoyed "abundant and accessible energy resources," along with vast economic and industrial growth.[4] As the economy grew, energy consumption outpaced production, leading to an increased reliance on imported foreign oil to satiate the country's energy needs.[5] This increased foreign demand prompted serious questions as to

4. FRED BOSSELMAN ET AL., ENERGY, ECONOMICS AND THE ENVIRONMENT 10 (Robert C. Clark et al. eds., 2000).

5. *Id.* at 11. Foreign oil supplies represent approximately fifty percent of the country's demand. *Id.*

whether the reliance on foreign resources could continue.[6] With fear it could not, the oil and gas industry began developing techniques to tap previously irrecoverable oil and gas shale beds and tight sand formations in the United States.[7] To efficiently draw oil and gas off of these unconventional resources, an underground injection technique known as hydraulic fracturing (fracking) was developed.[8]

Since its inception, fracking has been lauded for its ability to increase production[9] despite rising concerns the process may compromise groundwater.[10] As oil prices rise, fracking has become increasingly profitable, resulting in its widespread use over the last decade.[11] This increased fracking has raised concerns about the technique's environmental effects, leading the U.S. House of Representatives Appropriation Conference Committee to call upon the U.S. Environmental Protection Agency (EPA) to study fracking's impact on drinking water and groundwater.[12]

The federal government, however, is not the only entity concerned with fracking's effect on drinking water reserves, as several states have begun the process of developing comprehensive fracking standards.[13] Furthermore, France, which controls some of the biggest natural gas resources in Europe, has become the first country to impose an outright ban on fracking.[14] Shockingly, while many states were busy increasing their

6. *Id.* at 10.

7. DANIEL ARTHUR ET AL., HYDRAULIC FRACTURING CONSIDERATIONS FOR NATURAL GAS WELLS OF THE MARCELLUS SHALE 1 (2008), *available at* http://www.thefriendsvillegroup.com/HydraulicFracturingReport1.2008.pdf.

8. *See* BOSSELMAN ET AL., s*upra* note 4, at 333 (discussing secondary recovery).

9. *Id.*

10. ARTHUR ET AL., s*upra* note 7, at 1-2. Fracking's effect on groundwater reached the 11th Circuit Court of Appeals and merited additional investigation led by the Ground Water Protection Council. *Id.*

11. BOSSELMAN ET AL., s*upra* note 4, at 279.

12. Informational Public Meetings for Hydraulic Fracturing Research Study, 75 Fed. Reg. 35,023 (June 21, 2010) (indicating the EPA announced public meetings to explain its plan to study fracking's relationship to drinking water).

13. *See* COLO. CODE REGS. § 404-1(216) (2011) (requiring companies drilling and fracking in Colorado to submit a comprehensive drill plan); N.M. CODE R. § 19.15.36.8(A) (LexisNexis 2010) (requiring fracking permits); 25 PA. CODE § 78.18 (2011) (requiring heightened application procedures for enhanced recovery permits); OHIO DEP'T OF NATURAL RES., OHIO HYDRAULIC FRACTURING STATE REVIEW 4, (Jan. 2011), *available at* http://www.dnr.state.oh.us/Portals/11/oil/pdf/ stronger_review11.pdf (indicating Ohio has undergone comprehensive legal amendments to address hydraulic fracturing concerns); STATE OF OKLA., OKLAHOMA HYDRAULIC FRACTURING STATE REVIEW 4, (Jan. 2011), *available at* http://www.occeweb.com/STRONGER%20REVIEW-OK-201-19-2011.pdf (indicating the Oklahoma Corporation Committee has developed standards for fracking).

14. Theodora Filis, *Months of Protests Pay Off, France Becomes 1st Country to Ban Fracking,* UK PROGRESSIVE, Jul. 7, 2011, http://www.ukprogressive.co.uk/ months-of-protests-pay-off-france-becomes-1st-country-to-ban-fracking/ article13313 html.

regulatory requirements, North Dakota lawmakers unanimously approved a bill that endorsed fracking as an acceptable oil and gas recovery process within the state[15] and proclaimed the people of North Dakota supported the resource recovery technique.[16] As a result, the North Dakota Legislative Assembly's approval of fracking and the apparent ignorance of the groundwater contamination concerns surfacing nationally[17] has severely inhibited prompt implementation of heightened fracking-specific regulations aimed at mitigating the negative effects of fracking in North Dakota.

This Note challenges the state's determination that fracking is an inherently safe practice and suggests fiscally responsible avenues for increased regulation. Part II of this note describes the process of fracking and the reactions of both the federal government and general public to the potential health and environmental effects of fracking.[18] Part III discusses the impact of increased drilling activity in western North Dakota, illustrating the need for increased fracking regulations to ensure North Dakota's underground water resources do not become contaminated.[19] Finally, the importance of mitigating the effects of fracking is discussed, suggesting North Dakota take a proactive stance towards the EPA's fracking study.[20]

II. HYDRAULIC FRACTURING

"Hydraulic fracturing is a well stimulation process used to maximize the extraction of underground resources—oil, natural gas and geothermal energy."[21] Fracking was first commercially used in 1949,[22] but the fiscally onerous process did not become popular among drilling operators until the price of oil began increasing.[23] As oil prices rose, previously irrecoverable shale beds were routinely being tapped, leading to the worldwide use of

15. *See* H. B. 1216, 62nd Leg. Assemb. (Nd. 2011); H.C.R. 3008, 62nd Leg. Assemb. (Nd. 2011); S.B. 2371, 62nd Leg. Assemb. (Nd. 2011).

16. Teri Finneman, *N.D. Legislature: Committee Approves Bill that says Hydraulic Fracturing is Acceptable,* GRAND FORKS HERALD, Jan. 21, 2011, at A1.

17. Hannah Wiseman, *Untested Waters: The Rise of Hydraulic Fracturing in Oil and Gas Production and the Need to Revisit Regulation,* 20 FORDHAM ENVTL. L. REV. 115, 126 (2009).

18. *See* discussion *infra* Part II.A-B.

19. *See* discussion *infra* Part III.A-C.

20. *See* discussion *infra* Part IV.

21. U.S. ENVTL PROT. AGENCY, OFFICE OF RESEARCH & DEV., SCIENCE IN ACTION - HYDRAULIC FRACTURING RESEARCH STUDY 1-2 (June 2010), *available at* http://www.epa.gov/safewater/uic/pdfs/hfresearchstudyfs.pdf [hereinafter SCIENCE IN ACTION].

22. Coastal Oil & Gas Corp. v. Garza Energy Trust, 268 S.W.3d 1, 7 (Tex. 2008).

23. BOSSELMAN ET AL., s*upra* note 4, at 333.

fracking.[24] This section begins by detailing the mechanics of fracking, providing insight into the safety mechanisms used to mitigate fracking's effect on the environment and underground water resources.[25] Section B discusses government and public reactions to fracking.[26] Specific attention will be given to the manner in which federal regulations have evolved as a result of fracking's increased popularity.

A. THE MECHANICS OF HYDRAULIC FRACTURING

The fracking process begins by drilling a standard vertical well to a depth of approximately five hundred feet above the targeted resources.[27] The drilling operator then deviates the wellbore horizontally in excess of ten thousand feet, exposing the length of the well to the targeted resource.[28] Steel tubes are subsequently cemented within the wellbore to "case" the well[29] and ensure maintenance of the well's structural integrity.[30] This casing also aids in minimizing the flow of fracking fluids into the surrounding formation during the well stimulation process.[31] Once the casing has cured, its ability to withstand excessive fracking pressure is tested by pumping drilling mud into the wellbore to ensure the well is structurally sound to minimize the risk of a blowout.[32] Following pressure tests, the stimulation phase begins by: (1) isolating a portion of the well; (2) perforating the casing; and (3) injecting fracking fluid into the wellbore.[33]

The fracking fluid is generally comprised of water, chemical additives, and proppants such as sand or ceramic beads,[34] and is pumped into the

24. *Coastal Oil & Gas*, 268 S.W.3d at 7.

25. *See* discussion *infra* Part II.A.

26. *See* discussion *infra* Part II.B.

27. DIV. OF MINERAL RES., N.Y. DEP'T OF ENVTL. CONSERVATION, SUPPLEMENTAL GENERIC ENVIRONMENTAL IMPACT STATEMENT ON THE OIL, GAS AND SOLUTION MINING REGULATORY PROGRAM 5-21 (2009), *available at* ftp://ftp.dec.state ny.us/dmn/download/ OGdS GEISFull.pdf [hereinafter SUPPLEMENTAL GENERIC ENVIRONMENTAL IMPACT STATEMENT].

28. ENERGY POLICY RESEARCH FOUND., INC., THE BAKKEN BOOM: AN INTRODUCTION TO NORTH DAKOTA'S SHALE OIL 6 (Aug. 3, 2011), *available at* http://www.eprinc.org/pdf/ EPRINC-BakkenBoom.pdf.

29. Hydraulic Fracturing Process, U.S. Patent No. 3,709,300, col. 4 l. 7 (filed Aug. 27, 1971) (issued Jan. 9, 1973).

30. OFFICE OF RESEARCH & DEV., U.S. ENVTL. PROT. AGENCY, DRAFT PLAN TO STUDY THE POTENTIAL IMPACTS OF HYDRAULIC FRACTURING ON DRINKING WATER RESOURCES 12 (Feb. 2011), *available at* http://water.epa.gov/type/groundwater/uic/class2/hydraulicfracturing/upload/ HFStudyPlanDraft_SAB_020711.pdf [hereinafter DRAFT PLAN].

31. *Id.*

32. SUPPLEMENTAL GENERIC ENVIRONMENTAL IMPACT STATEMENT, *supra* note 27, at 5-91.

33. *Id*. at 5-92.

34. DRAFT PLAN, *supra* note 30, at 12.

isolated wellbore at a rate sufficient to create a pressure gradient downhole in excess of the formation strength.[35] The increased pressure cracks the shale formation surrounding the wellbore, thereby creating pores which extend outward from the wellbore into the resource rich formation.[36] The fracking fluid is then pumped off the well and a "fluid loss reducing agent" is injected into the well, applying a thin layer of protection to the fractures in an attempt to reduce the possibility fracking fluid could permeate the wellbore and enter underground aquifers through the newly formed fractures.[37] The pressure gradient is then increased for a second time to further extend the fractures and increase the ability for oil and gas to flow from the high pressure formation into the low pressure wellbore.[38] This re-fracturing process can be administered numerous times over the well's life to stimulate the well and increase production to maintain the well's profitability.[39]

Once the well has been properly fractured, it is then prepared for production by pumping a propping agent into the wellbore to prevent the newly created fractures from healing when the water and fracking fluids are drawn off for the last time.[40] The segmented fracking process described above is continued along the length of the horizontal wellbore by working in isolated sections to maintain control of the direction and length of fractures.[41] Isolated fracking minimizes the risk of errant fractures that could perforate underwater aquifers or private wells, thereby limiting contamination of the surrounding environment.[42]

B. REACTIONS TO FRACKING

The 2001 surge in oil prices, in conjunction with the inauguration of President George W. Bush whose national energy policy called for developing domestic oil resources,[43] set the stage for fracking to garner considerable positive attention.[44] Fracking was being lauded as a method of

35. '300 Patent col. 1 l. 9-32.
36. *Id.*
37. *Id.*
38. *Id.*
39. DRAFT PLAN, *supra* note 30, at 13.
40. *See* '300 Patent col. 9.
41. Wiseman, s*upra* note 17, at 120-21 (describing the segmented drilling process through the use of "swell packers").
42. *Id.*
43. BOSSELMAN ET AL., s*upra* note 4, at 243.
44. *Id.* at 243-48. Fracking has vastly increased the volume of domestic resources. *Id.*

"serv[ing] the public's need for energy"[45] by unlocking precious resources that would be otherwise inextricable.[46] The following section will discuss the public's concerns surrounding fracking and the federal government's seemingly pro-fracking regulatory history and sentiments.

1. *Public Reactions*

The immense quantity of water used during fracking[47] has always concerned environmental groups.[48] Residents in close proximity to fracking sites, however, appear to have a more immediate and dangerous issue on their hands than excessive water use.[49] Concerns about water quality, as opposed to quantity, were raised in 2004 when residents suspected immense fracking pressures had compromised the integrity of their private water wells, allowing fracking fluids, oil, and gas to seep through the cased wells and into their drinking water.[50] These complaints appear to be supported by scientific principle, as the high pressure fracking process is believed to push hydraulic fluid away from the wellbore and into the surrounding formation, and potentially aquifers, for an average of forty to one hundred hours.[51] The forcing of hydraulic fluid away from the wellbore raises concerns the pressurization may not only be fracturing the shale bed immediately surrounding the well, but may also be fracturing and

45. SUPPLEMENTAL GENERIC ENVIRONMENTAL IMPACT STATEMENT, *supra* note 27, at 2-2 (indicating extraction of natural gas from the Marcellus will provide energy and economic benefit to the public).

46. TIMOTHY CONSIDINE ET AL., AN EMERGING GIANT: PROSPECTS AND ECONOMIC IMPACTS OF DEVELOPING THE MARCELLUS SHALE NATURAL GAS PLAY 4 (July 24, 2009), *available at* http://s3.amazonaws.com/propublica/assets/monongahela/Economic/impacts Marcellus.pdf.

47. SUPPLEMENTAL GENERIC ENVIRONMENTAL IMPACT STATEMENT, *supra* note 27, at 5-73 (estimating 2.4 million to 7.8 million gallons of water may be used during a fracking procedure).

48. *See* Wiseman, *supra* note 17, at 134-35.

49. *See* U.S. ENVTL. PROT. AGENCY, EVALUATION OF IMPACTS TO UNDERGROUND SOURCES OF DRINKING WATER BY HYDRAULIC FRACTURING OF COALBED METHANE RESERVOIRS 6-2 to 6-16 (June 2004), *available at* http://nepis.epa.gov/Exe/zyPURL.cgi?Dockey=P100A2CM.txt [hereinafter COALBED METHANE STUDY]. Citizens and environmental groups in Colorado, New Mexico, Virginia, and Wyoming report fracking has contaminated their drinking water. *See id.* (discussing impacts that hydraulic fracking of coalbed methane wells may have on groundwater).

50. *See id.*

51. *See* SUPPLEMENTAL GENERIC ENVIRONMENTAL IMPACT STATEMENT, *supra* note 27, at 5-93.

> The time spent pumping is the only time, except for when the well is shut-in, that wellbore pressure exceeds pressure in the surrounding rocks. Therefore, the hours spent pumping is the only time that fluid in fractures and in the rocks surrounding the fractures would move away from the wellbore instead of towards it.

Id.

essentially tapping residential water wells, allowing oil and gas from the resource pool to seep into the private wells.[52]

Evidence of pressurized seepage surfaced when homeowners in Colorado and Pennsylvania were reportedly able to light the drinking water running from their indoor faucets on fire.[53] Although the thought of torch-like kitchen faucets[54] should raise red flags as to the safety of fracking, there is still no "unequivocal evidence" fracking has caused oil or gas movement into aquifers and wells.[55] Should the EPA find evidence of harmful effects to drinking water as a result of their 2012 study, the decision in *Coastal Oil & Gas Corporation v. Garza Energy Trust*[56] may foreshadow judicial support for those citizens suffering the effects of fracking.[57]

In *Coastal Oil,* the respondent argued fracking of an adjacent tract of land created fractures which encroached upon his property, draining the gas reserves and constituting trespass.[58] For the most part, the Supreme Court of Texas ignored the trespass claim and relied upon the rule of capture to determine the respondent did not in fact own the resource pool, rendering the trespass inactionable.[59] Although the holding itself gave little insight into the court's sentiment towards fracking,[60] Justice Johnson's dissenting opinion indicated the court had previously suggested "sand fracturing may constitute a trespass, and . . . that subsurface trespasses are not different from other trespasses."[61] Justice Johnson went on to illustrate the ability experts have to determine the length of a fracture,[62] demonstrating potential future support for an actionable trespass claim against fracking operators who contaminate residential wells, should evidence be proffered linking well contamination to the presence of errant fracking seams.[63]

52. Wiseman, *supra* note 17, at 126.

53. Abraham Lustgarten, *Colorado Study Links Methane in Water to Drilling,* PROPUBLICA, Apr. 22, 2009, http://www.propublica.org/article/colorado-study-links-methane-in-water-drilling-422.

54. *Id.*

55. Wiseman, s*upra* note 17, at 136.

56. 268 S.W.3d 1 (Tex. 2008).

57. Wiseman, *supra* note 17, at 149.

58. *Coastal Oil & Gas Corp.*, 268 S.W.3d at 9.

59. *See id*. at 15.

60. *Id.* at 17 (holding damages for drainage were precluded by the rule of capture).

61. *Id.* at 44 (Johnson, J., dissenting) (citation omitted).

62. *Id.*

63. *See generally* Wiseman, *supra* note 17, at 136.

2. *Federal Response to Fracking*

Much like the court ignored the fracking issue in *Coastal Oil,*[64] the EPA, under Congress' direction, has been similarly unwilling to address public concerns stemming from fracking, until recently.[65] Instead, the federal government has a history of making environmental concessions for the oil and gas industry to promote domestic resource recovery.[66]

a. Resource Conservation and Recovery Act

Following "intense lobbying by the oil-and-gas industry," Congress initiated its first concession for the industry in 1988 by exempting the exploration and production (E&P) wastes created by oil and gas operators from the Resource Conservation and Recovery Act (RCRA).[67] Previously, RCRA gave the EPA authority to regulate the storage, treatment, and disposal of hazardous wastes produced by industry in accordance with "rigorous safeguards" aimed at ensuring human health and environmental protection.[68] The EPA, however, determined branding exploration wastes as "hazardous" under RCRA's Subtitle C was "unwarranted because of the relatively low risk of the wastes and the presence of generally effective State and Federal regulatory programs."[69] As a result of the EPA's determination, Congress lifted the safeguards of RCRA's Subtitle C from the oil and gas industry until the EPA could determine whether E&P wastes were in fact dangerous.[70] Eight years after the exemption was put into place, the EPA determined the mismanagement of E&P wastes in the past "had resulted in widespread damage to the environment and [posed] significant risks to human health."[71] Despite these findings, the government refused to repeal the oil and gas industry's exemption, resulting in fracturing fluid being deemed a non-hazardous waste, governed by RCRA's less stringent Subtitle D.[72]

64. *See Coastal Oil & Gas Corp.*, 268 S.W.3d at 17.

65. *See generally* Legal Envtl. Assistance Found., Inc., v. U.S. Envtl. Prot. Agency, 118 F.3d 1467 (11th Cir. 1997).

66. *See generally* 42 U.S.C. § 300h(d)(1)(B)(ii) (2006) (illustrating fracking became exempt from the SDWA); *id.* § 6922(c) (indicating in 1988 oil and gas exploration wastes classification as "hazardous" under Subtitle C was lifted).

67. James R. Cox, *Revisiting RCRA's Oilfield Waste Exemption as to Certain Hazardous Oilfield Exploration and Production Wastes*, 14 VILL. ENVTL. L.J. 1, 3 (2003).

68. *Id.* at 2.

69. Regulatory Determination for Oil and Gas and Geothermal Exploration, Development and Production Wastes, 53 Fed. Reg. 25,459 (July 6, 1988).

70. Cox, *supra* note 67, at 3.

71. *Id.* at 5.

72. *Id. at* 3, 5-6.

b. Safe Drinking Water Act

In keeping with providing federal exemptions for the oil and gas industry, the EPA deemed fracking to be a well stimulation technique deserving exemption from the Safe Drinking Water Act's (SDWA) stringent Underground Injection Control (UIC) regulations, as well.[73] This exemption gave drilling operators the ability to inject fracking fluid into the ground without complying with UIC guidelines, which were developed to ensure drilling did not endanger underground sources of drinking water (USDWs).[74] The Legal Environmental Assistance Foundation challenged the EPA's assertion "that hydraulic fracturing d[id] not fall within the regulatory definition of 'underground injection,'"[75] contending the EPA was legally required to regulate fracking under the SDWA.[76] The Eleventh Circuit ruled in the Legal Foundation's favor, indicating "hydraulic fracturing activities constitute 'underground injection' under Part C of the SDWA."[77] The ruling challenged the EPA's unwillingness to regulate fracking,[78] and thus, in 2004, the EPA launched a study investigating the effect coalbed methane fracking had on USDWs.[79]

The EPA performed a peer-review of publications, accepted public comment, and conducted industry interviews before concluding the injection of fracking fluids into coalbed methane wells caused minimal damage to underground drinking water.[80] As a result, further investigation was deemed unwarranted, despite the fact the study confirmed, through industry interviews, harmful chemicals were being injected into the ground by fracking operators.[81] The chemical injections did not overly concern the EPA, however, as they published their study indicating the risks posed to USDWs were "reduced significantly by groundwater production and injected fluid recovery, combined with the mitigating effects of dilution and dispersion, adsorption, and potentially biodegradation."[82] With the EPA's determination fracking was safe,[83] and concerns continuing to mount over

73. Legal Envtl. Assistance Found., Inc., v. U.S. Envtl. Prot. Agency, 118 F.3d 1467, 1476-77 (11th Cir. 1997) (indicating the EPA argued hydraulic fracturing was a drilling technique Congress did not intend to regulate).

74. *See* Markus G. Puder, *Did the Eleventh Circuit Crack "Frac"*? *– Hydraulic Fracturing After the Court's Landmark* LEAF *Decision,* 18 Va. ENVTL. L.J. 507, 516-17 (1999).

75. *Legal Envtl. Assistance Found., Inc.*, 118 F.3d at 1478.

76. *Id*. at 1469.

77. *Id.* at 1478.

78. *Id.*

79. COALBED METHANE STUDY, *supra*, note 49, at 1-1.

80. *Id.* at 2-3, 7-5.

81. *Id.* at 7-5.

82. *Id*.

83. *Id.*

the country's increased energy consumption,[84] the federal government took action through the Energy Policy Act of 2005 to ensure concerned citizens and groups such as the Legal Environmental Foundation would no longer inhibit fracking endeavors.[85]

c. Energy Policy Act of 2005

The Energy Policy Act of 2005 (EPAct 2005) is likely the federal government's most significant reaction to fracking.[86] EPAct 2005's objective was "[t]o ensure jobs for our future with secure, affordable, and reliable energy."[87] The objective was to be achieved by attempting to decrease energy consumption while increasing production from unconventional energy sources.[88] Tax breaks were implemented for companies developing and promoting renewable resources,[89] and homeowners received tax credits for environmentally friendly home renovations and upgrades.[90] On the surface, EPAct 2005 was bursting with green incentives for homeowners and alternative energy entrepreneurs alike.[91]

Although many of EPAct 2005's initiatives depicted a progressive and environmentally concerned government, it contained a provision that rendered environmental concerns secondary to domestic oil production.[92] EPAct 2005 contained a provision, later coined "the Halliburton loophole,"[93] which stripped the EPA's authority to regulate fracking by amending the SDWA to exclude fracking from the UIC program.[94] This exemption ensured environmentally based legal cases would no longer hinder domestic oil production.[95] As a result of EPAct 2005, operators were no longer required to obtain fracking permits assuring compliance with SDWA standards, and were instead regulated solely by state drilling

84. BOSSELMAN ET AL., s*upra* note 4, at 10.

85. *See generally* Energy Policy Act of 2005, Pub. L. No. 109-58, § 322, 119 Stat. 594, 694 (2005) (codified at 42 U.S.C. § 300h(d)).

86. *See generally id.* (officially stripping the EPA of their authority to regulate fracking fluids under the UIC program).

87. *See* Energy Policy Act of 2005, 42 U.S.C. § 300h(d) (2006).

88. Energy Policy Act of 2005 § 101-31, 42 U.S.C. §§ 16231-35.

89. Energy Policy Act of 2005 § 1301, 26 U.S.C. § 45.

90. Energy Policy Act of 2005 § 1333, 26 U.S.C. § 25c.

91. *See generally* Energy Policy Act of 2005, Pub. L. No. 109-58, 119 Stat. 594 (2005) (codified in scattered sections of 26 U.S.C. and 42 U.S.C.).

92. Energy Policy Act of 2005 § 322, 42 U.S.C. § 300h(d).

93. Editorial, *The Halliburton Loophole,* N.Y. TIMES, Nov. 3, 2009, at A38.

94. Energy Policy Act of 2005, § 322, 42 U.S.C. § 300h(d).

95. EPAct 2005 statutorily overruled the court's decision in *LEAF*, where the court found the EPA was required to regulate fracking under SDWA's UIC program. Legal Envtl. Assistance Found., Inc., v. U.S. Envtl. Prot. Agency, 118 F.3d 1467, 1478 (11th Cir. 1997).

regulations.[96] The news of deregulation came as a considerable blow to environmental groups, as it appeared fracking's future in the oil fields had just been secured by federal legislation.[97]

d. EPA's 2010-2012 Scientific Study

Although RCRA and SDWA exemptions historically seemed to favor industry,[98] in 2010, the federal government inched away from its pro-industry policies by calling upon the EPA's Office of Research and Development to conduct a scientific study investigating "hydraulic fracturing's potential impact on drinking water, human health and the environment . . . ."[99] The EPA began their study by issuing voluntary information requests to nine major natural gas drilling companies.[100] The requests sought information pertaining to chemical compositions of fracking fluids, data on human health and environmental impacts, and the standard operating procedures used by fracking operators.[101] Following a brief standoff with Halliburton, which claimed the information was proprietary and protected by trade secret,[102] all nine operators complied within two months of the initial request.[103]

With the preliminary information attained and a draft study developed, the EPA assembled a twenty-three member Science Advisory Board (SAB) consisting of engineers, physicians, geologists, and toxicologists.[104] The panel was meticulously chosen, and there were few representatives with

96. *See* Wiseman, *supra* note 17, at 157. Federal deregulation paired with the decision in *Coastal Oil* made state regulation "the central mechanism controlling fracking and its effects." *Id.*

97. *See id.* at 145. Following implementation of the Energy Act "[s]everal environmental groups . . . continued to push for federal regulation." *Id.*

98. *See* Energy Policy Act of 2005 § 322, 42 U.S.C. § 300h(d); Regulatory Determination for Oil and Gas and Geothermal Exploration, Development and Production Wastes, 53 Fed. Reg. 25,447 (July 6, 1988).

99. U.S. Envtl. Prot. Agency, *Current Hydraulic Fracturing Study 2010-2012*, FRACKING RESOURCE GUIDE (Apr. 13, 2010), http://frack mixplex.com/content/us-environmental-protection-agency-epa-hydraulic-fracturing-study-2010-2012 [hereinafter *Fracking Study*]. In response to serious health concerns submitted by the public, Congress funded a transparent and unbiased scientific study to determine how fracking was affecting human health and the environment. *Id.*

100. Press Release, Envtl. Prot. Agency, EPA Formally Request Information From Companies About Chemicals Used in Natural Gas Extraction (Sept. 9, 2010), *available at* http://yosemite.epa.gov/opa/admpress nsf/d0cf6618525a9efb85257359003fb69d/ec57125b66353b7e85257799005c1d64!OpenDocument.

101. *Id.*

102. Press Release, Envtl. Prot. Agency, Eight of Nine U.S. Companies Agree to Work with EPA Regarding Chemicals Used in Natural Gas Extraction (Nov. 9, 2010), *available at* http://yosemite.epa.gov/opa/admpress nsf/d0cf6618525a9efb85257359003fb69d/a96496444c546959852577d6005e63d6!OpenDocument.

103. *Fracking Study*, *supra* note 99.

104. U.S. Envtl. Prot. Agency, *Hydraulic Fracturing Study Plan Review Panel*, FRACKING RESOURCE GUIDE (Jan. 13, 2011), http://frack mixplex.com.

connections to the oil and gas industry because the EPA's 2004 coalbed methane study garnered significant disapproval for employing numerous interested panel members.[105] In February of 2011, the EPA submitted a draft of their study to the SAB.[106] The SAB scrutinized the proposal and provided an opportunity for stakeholder and public comment during the project review period.[107] According to the initial draft, the EPA will focus on the resulting impacts on drinking water due to fracking's water acquisition procedures, chemical mixing, well injection, flowback and produced waters operating procedures, and wastewater treatment and disposal.[108] A report containing interim study results is expected to be available from the EPA in late 2012, with additional study results published in 2014.[109] Although past studies have yielded little action by government,[110] the federally funded nationwide approach to studying fracking seems to indicate the federal government is concerned with fracking and is willing to take a proactive approach to ensure resource extraction is not contaminating the nation's drinking water sources.

III. ANAYSIS OF NORTH DAKOTA OIL AND GAS REGULATORY LAW

North Dakota is currently experiencing an economic boom due to oil extraction in the Bakken Shale Formation in western North Dakota.[111] Section A will describe the Bakken Formation and the economic impact it has had on the State.[112] The importance of sufficient regulations to ensure fracking does not contaminate underground water sources will also be outlined.[113] Section B will discuss the State's authority to regulate the oil and gas industry and the mechanisms by which they control fracking.[114]

105. Laura Legere, *Peer-Review Panel for EPA Fracking Study Includes Six Pa. Scientists,* THETIMES-TRIBUNE.COM (Jan. 18, 2011), http://thetimes-tribune.com /news/gas-drilling/peer-review-panel-for-epa-fracking-study-includes-six-pa-scientists-1.1091757#axzz1BdYoGN5z.

106. Memorandum from Fred S. Hauchman, Dir., Office of Sci. Policy, to Edward Halon, Designated Fed. Officer, EPA Sci. Advisory Bd. Staff (Feb. 8, 2011), *available at* http://www.epa.gov/hfstudy/SAB-Revew-Request-Final-2-8-11.pdf.

107. Jalil Isa, *EPA Submits Draft Hydraulic Fracturing Study Plan to Independent Scientists for Review*, U.S. ENVTL. PROTECTION AGENCY (Feb. 8, 2011), http://yosemite.epa.gov/opa/admpress.nsf/d0cf6618525a9efb85257359003fb69d/26195e235a35cb3885257831005fd9cd!OpenDocument.

108. DRAFT PLAN, *supra* note 30, at 18.

109. *Id.*

110. *See* COALBED METHANE STUDY, *supra*, note 49, at 7-6.

111. Owen L. Anderson, *North Dakota's Energy Landscape,* 85 N.D. L. REV. 715, 719 (2009).

112. *See* discussion *infra* Part III.A.

113. *See* discussion *infra* Part III.A.

114. *See* discussion *infra* Part III.A-B.

Section C will then analyze the State's decision to regulate fracking through general permitting and will compare North Dakota's current oil and gas regulations to those enacted by other oil rich states.[115] Recommendations will also be made to increase regulatory requirements and promote cautious fracking aimed at minimizing environmental damage.[116]

A. THE NEED FOR OIL AND GAS REGULATION

Federal deregulation of the oil and gas industry has been a hot topic for citizens in the eastern states for some time,[117] as they have been privy to the benefits and detriments of fracking since 2003.[118] North Dakotans, however, have more recently been introduced to fracking concerns thanks to the revival of the Bakken oil field.[119] As a result of the increased extraction capabilities fracking elicits, the Bakken has experienced an exploration and production boom.[120] Through enhanced seismic surveying and fracking's ability to tap tight shale formations, Bakken's oil reserves are monumental and now "rank with the new deepwater oil discoveries in the Gulf of Mexico and offshore Brazil."[121] It has been estimated that 4.3 billion barrels of technically recoverable oil currently sits beneath the surface of the Bakken, with daily production projected to increase to over 400,000 barrels per day.[122] The immense oil reserves have benefitted North Dakota by improving infrastructure, decreasing unemployment rates, and increasing tax revenues;[123] however, the economic prosperity does not come without a price.[124] Because it is hard for residents to see past the

115. *See* discussion *infra* Part III.C.

116. *See* discussion *infra* Part III.C.

117. *See* Wiseman, *supra* note 17, at 157. "[M]ajor producing states" had state regulatory programs specifically for coalbed methane fracking's potential health effects due to the federal government's unwillingness to regulate. *Id.*

118. CONSIDINE ET AL., *supra* note 46, at 3.

119. *Hydraulic Fracturing Used in North Dakota Oil Fields Gives the State the Lowest Unemployment Rate in the Nation*, MARCELLUS DRILLING NEWS (Feb. 10, 2011), http://marcellusdrilling.com/2011/02/hydraulic-fracturing-used-in-north-dakota-oil-fields-gives-that-state-the-lowest-unemployment-rate-in-the-nation [hereinafter DRILLING NEWS]. Production is rising exponentially, and there is essentially not enough space in the pipelines to bring the oil to market. *Id.* Instead, oil is being transported to refineries by truck and rail. *Id.*

120. Anderson, *supra* note 111, at 719.

121. *Id.*

122. *Id.*

123. DEAN A. BANGSUND & F. LARRY LEISTRITZ, PETROLEUM INDUSTRY'S ECONOMIC CONTRIBUTION TO NORTH DAKOTA IN 2007 8-9 (Jan. 2009), *available at* http://www nd.gov/ndic/ogrp/info/g-016-035-summary1-09.pdf (indicating there has been an increase in leasing activity, drill rigs, tax collections, and other financial and economic aspects of the industry in North Dakota); DRILLING NEWS, *supra* note 119 (indicating North Dakota's unemployment rate has fallen to 3.8%, less than half the national average of 9%).

124. Anderson, s*upra* note 111, at 720-21 (discussing the inability to fully control the extent of fractures and the ensuing litigation fracking may create).

economic benefits of an oil and gas boom, it is up to state regulators to promote increased oil and gas production without compromising the health and welfare of their citizens through regulatory requirements placed upon the oil and gas industry within the state.

In North Dakota, regulation of the oil and gas industry is controlled by the North Dakota Industrial Commission's (NDIC) Oil and Gas Division.[125] The NDIC has the authority to regulate: "[t]he drilling, producing, and plugging of wells[;] . . . chemical treatment of wells[;] . . . [t]he spacing of wells[;] . . . [o]perations to increase ultimate recovery[;] . . . [d]isposal of saltwater and oilfield wastes[; and] . . . [t]he underground storage of oil or gas."[126] In addition, the NDIC has complete authority to regulate fracking.[127]

State control over regulatory issues generally provides the state with a heightened opportunity to tailor regulations to ensure state-specific environmental, health, and safety concerns are met.[128] Despite a recent attempt to amend and increase a handful of drilling regulations in North Dakota,[129] state lawmakers initially ignored their duty to responsibly promote local resources by unanimously approving a bill endorsing hydraulic fracturing as a safe and acceptable oil and gas recovery process.[130] The North Dakota House of Representatives dropped legislation proposed following the massive Gulf oil spill, which would have increased the regulatory requirements for fracking operators due to a fear the increased regulations would have effectively killed the oil boom in North Dakota.[131] In the midst of the EPA's study to assess groundwater quality near fracking sites, the State has sent a message to the oil and gas industry that fracking is welcomed in North Dakota,[132] illustrating the State's concern for North Dakota citizens is of lower priority. Fortunately, the

125. N.D. CENT CODE § 38-08-04 (Supp. 2011) (indicating "[t]he [NDIC] has continuing jurisdiction and authority over all persons and property, public and private . . .").

126. *Id.* § 38-08-04(2)(a)-(f).

127. Wiseman, *supra* note 17, at 145 (stating EPAct 2005 withdrew fracking from federal regulation, giving the states the authority to regulate).

128. Richard J. Pierce, Jr., *Regulation, Deregulation, Federalism, and Administrative Law: Agency Power to Preempt State Regulation*, 46 U. PITT. L. REV. 607, 622 (1985).

129. *See generally* OIL & GAS DIV., N.D. INDUS. COMM'N, FULL NOTICE OF INTENT TO ADOPT AND AMEND ADMINISTRATIVE RULES (Sept. 23, 2011), *available at* https://www.dmr nd. gov/oilgas /rules2012f ullnotice.pdf.

130. Finneman, *supra* note 16, at A1.

131. Eloise Ogden, *House Drops Regulations on Hydraulic Fracturing,* MINOT DAILY NEWS, July 29, 2010, *available at* http://www minotdailynews.com/page/content.detail/id/541496/ House-drops-regulations-on-hydraulic-fracturing html.

132. Finneman, *supra* note 16, at A1; *see also* S. Con. Res. 4020, 61st Legis. Assemb. (N.D. 2009) ("urging Congress to preserve the exemption of hydraulic fracturing from the provisions of the [SDWA] and to not enact legislation that removes the exemption for hydraulic fracturing").

EPA does not harbor the same nonchalant attitude towards North Dakota's environmental concerns and has made Killdeer and Dunn Counties case study sites devoted to assessing production well failures and suspected drinking water aquifer contamination due to fracking.[133]

B. FRACKING SPECIFIC REGULATION

The lack of concern for human health and the environment is evident by the State's determination that regulations specific to fracking operators are unnecessary.[134] Operators in North Dakota are regulated by the "general permitting process"[135] that seeks "to conserve the natural resources of North Dakota, to prevent waste, and to provide for operation in a manner as to protect correlative rights of all owners of crude oil and natural gas,"[136] but lack specific guidelines to mitigate the dangers of fracking. The decision to regulate via general permitting is common among oil rich states and lauded as a sufficient form of regulation,[137] yet states with heavy fracking activity such as New York, New Jersey, and Pennsylvania have recently deviated from the status quo and have begun proposing bills to increase the regulatory requirements for fracking operators.[138] Even Texas, a state generally concerned only with increasing production, has begun inching towards increased regulation, as both its House and Senate have approved a bill requiring operators to fully disclose the fracking chemicals used during well stimulation.[139]

Those opposed to an augmented model of regulation naturally argue increased regulation is costly and unwarranted without scientific data confirming the hazardous effects of fracking.[140] This negative sentiment was exhibited by NDIC Oil and Gas Director, Lynn Helms, who indicated

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133. DRAFT PLAN, *supra* note 30, at 44.

134. *See* N.D. CENT. CODE § 43-03-01.17 (2009) (indicating North Dakota specifically excludes hydraulic fracturing from their heightened UIC regulations).

135. Wiseman, *supra* note 17, at 165 (explaining the states, baring Alabama, have always regulated fracking by general permitting processes).

136. N.D. ADMIN. CODE 43-02-03-02 (2011).

137. *See* Wiseman, *supra* note 17, at 165-66 (stating Alabama was the lone state to deem fracking a form of underground injection).

138. *See id.* at 157-67 (detailing state specific regulations); *see also* S. 6541, 2011 Legis. Assemb., Reg. Sess. (N.Y. 2011) (imposing a five-year moratorium on fracking in order to properly conduct an investigation on the effects of fracking); S. 2576, 214th Leg. (N.J 2010) (banning fracking in New Jersey in order to protect the Delaware River).

139. H.R. 3328, 82d Leg. (Tex. 2011).

140. *See* Rebecca Beitsch, *Hoeven Tells EPA that N.D. Can Handle Fracturing,* BISMARCK TRIBUNE, May 16, 2010, at C1. Lynn Helms, director of the NDIC Oil and Gas Division, said "he is opposed to the potential regulations, not because they would drastically change the process, but rather because he believes drilling through fracking would have to be abandoned until the new regulations were in place." *Id.*

the implementation of more stringent state regulations would likely shut the Bakken down for three years, resulting in significant economic harm to the State.[141] In opposition to Helms' view, a proposal for more stringent state regulation phased-in over a reasonable period of time would likely have few negative effects on industry.[142] Should operators be given sufficient training to become familiar with the heightened regulatory requirements and the requirements be phased-in slowly, it seems drastic to conclude the approximately 178 rigs[143] currently drilling in the Bakken would pack up their rigs and leave the state. If the EPA's current study concluded increased regulatory requirements were necessary, the requirements would likely be implemented over a reasonable period of time to allow operators to adjust to the regulatory changes with minimal negative effects on exploration and production.[144] As a result, if North Dakota took a proactive approach to fracking regulation, they could minimize the shock of federally induced regulation and set themselves up to be leaders on a national scale, dedicated to extracting oil with environmentally centered initiatives.

C. REALISTIC AND REASONABLE AREAS FOR ENHANCED REGULATION

Although fracking's effects on the environment vary by region, there are necessarily known effects.[145] This section will discuss these known effects and will suggest areas for heightened regulation to mitigate damage to the environment and contamination of underground drinking water.[146] North Dakota's permitting procedures will be analyzed,[147] and increased fracking fluid disclosure requirements will be proposed.[148] It should be noted the EPA's study and state reactions to fracking have been rapidly changing since 2010, and as a result, following the publication of this article, North Dakota proposed some amendments to several drilling

141. *Id.*

142. *See* Ilya Marritz, *Drilling Poses Risk to Pennsylvania Water Supplies,* NAT'L PUB. RADIO (June 16, 2010), *available at* http://www npr.org/player/v2/mediaPlayer html? action=1&t=1&islist=false&id=127887773&m=127887751.

143. LYNN HELMS, DEP'T OF MINERAL RES., N.D. INDUS. COMM'N, DIRECTORS CUT (Jun. 20, 2011), *available at* https://www.dmr nd.gov/oilgas/ directorscut/directorscut-2011-06-20.pdf (indicating the all-time record high of drill rigs within the state was 178 on May 9-10, 2011).

144. *See* BOSSELMAN ET AL., *supra* note 4, at 412. New federal legislation is commonly phased in over a period of years, even if the legislation aims to protect human health and the environment. *Id.* For example, following the Exxon Valdez spill, new legislation required ships to be retrofitted for double hulls under a phased in schedule of *over 20 years*. *Id.* (emphasis added).

145. Wiseman, s*upra* note 17, at 140.

146. *See* discussion *infra* Part III.C.1-2.

147. *See* discussion *infra* Part III.C.1.

148. *See* discussion *infra* Part III.C.2.

regulations that will not be discussed herein, but may in fact provide increased protections for the environment and North Dakota citizens if approved and officially amended.

1. *Permitting Procedures*

In preparing to fracture a well in North Dakota, operators are required to follow general guidelines for conventional oil and gas drilling under North Dakota Century Code Section 38-08-05.[149] Under Section 38-08-05, operators must ensure the proposed drill site is not within five hundred feet of an occupied dwelling, barring waiver from the homeowner or commission determination that failure to drill would constitute waste.[150] Operators are also obliged to provide notice of the proposed drilling to all owners of "permanently occupied dwelling[s] located within one-quarter mile . . . of the proposed oil or gas well."[151] Once the NDIC approves the drill site, operators must submit a bond conditioned on full compliance with North Dakota Century Code Chapter 38-08.[152] Once the bonding requirements are satisfied, operators may begin drilling and fracking the proposed well.[153] Seemingly absent from the permitting process in North Dakota is an environmental impact study,[154] which is commonly used to illustrate the potential damage that could result from oil and gas extraction at a given drill site. In the following section, the importance of an environmental assessment will be illustrated and a recommendation for mandatory NDIC impact studies will be suggested.[155] Finally, increased bonding requirements will be discussed as a means to ensure fiscal resources are available for site reclamation should a spill or well blowout occur.[156]

a. Environmental Impact Study

North Dakota's oil and gas regulations indicate a surveyor certified plat describing the location and proposed drilling process must be submitted to the NDIC before a drilling application is approved.[157] Though the plat

149. N.D. CENT. CODE § 38-08-05 (Supp. 2011).

150. *Id.* "Waste" is generally defined as "inefficient, excessive, or improper use of, or the unnecessary dissipation of reservoir energy." *Id.* § 38-08-02(16)(b).

151. *Id.* § 38-08-05.

152. N.D. ADMIN. CODE 43-02-03-15(1), (4) (2011).

153. *Id.* at 43-02-03-15(1).

154. *Id.* at 43-02-03-16 (illustrating a permit to drill does not require an environmental impact study be completed).

155. *See* discussion *infra* Part III.C.1.a.

156. *See* discussion *infra* Part III.C.1.b.

157. N.D. ADMIN. CODE 43-02-03-16.

details the physical location of the site and proposed drilling depths, it makes no mention of the drill site's environmental surroundings.[158] North Dakota appears to have turned a blind eye to the environmental effects of drilling and fracking, while Colorado,[159] Pennsylvania,[160] and New York[161] have all placed a heightened burden on operators by requiring plats, a drill plan, and a detailed environmental assessment of the site.

New York uses an Environmental Assessment Form (EAF) and requires operators to provide information detailing the physical and vegetative setting of the property surrounding the fracking site, the character of current land use, areas of projected disruption, procedures for securing sufficient water supplies, and erosion and reclamation plans.[162] This detailed study provides the Conservation Department with sufficient information to carefully evaluate site-specific concerns and determine if heightened requirements should be placed upon the drilling operators in order to mitigate the risk of environmental damage.[163]

The feasibility of a similar EAF requirement in North Dakota seems reasonable because the EAF is completed without employing an environmental specialist and requires only a thorough examination of the drill site and consultation with local land use and water supply agencies.[164] Furthermore, the costs associated with spill clean-up of an environmentally fragile area unbeknownst to the NDIC upon approval would be much more costly than the relatively low cost of filing an EAF.[165] As the Vice President of Range Resources, a major player in the Marcellus Shale region, has indicated, stricter standards are welcomed by industry, as "it's always better and cheaper to do it right the first time."[166] If the NDIC required drilling operators to "do it right the first time"[167] and complete an EAF detailing the environmental concerns associated with a drill site, the NDIC would have an increased ability to invoke proper due diligence when

158. *See id.*

159. COLO. CODE REGS. § 404-1(216)(c) (2011).

160. 25 PA. CODE § 271.127 (2011).

161. *Well Permitting Process*, N.Y. DEP'T OF ENVTL. CONSERVATION, http://www.dec ny. gov/energy/1772 html (last visited Dec. 29, 2011).

162. DIV. OF MINERAL RES., N.Y. DEP'T OF ENVTL. CONSERVATION, ENVIRONMENTAL ASSESSMENT FORM, *available at* http://www.dec ny.gov/docs/materials_minerals_pdf/eaf_ dril.pdf.

163. *See generally id.*

164. *See id.* New York provides a list of local resources drilling operators may contact to make filing the EAF a more streamlined process, requiring no specialized environmental knowledge. *Id.*

165. *See generally id.* (indicating the three page EAF is filled out by the operator and does not require expensive tests or specialists).

166. Marritz, *supra* note 142.

167. *Id.*

approving drilling permits, ensuring the environment is not unduly compromised by oil and gas extraction.

Those opposed to increased regulation may argue EAF requirements are costly examples of overregulation, yet several states are enforcing these forms of increased regulation, indicating the regulations are not overly burdensome on fracking operators.[168] Alabama has increased its requirements for fracking operators in an attempt "to control the effects of [fracking],"[169] while Colorado has proposed environmentally protective requirements as a result of the recent fracking boom in the Green River Shale Basin.[170] New York has even gone a step further by placing a moratorium on fracking until new permitting guidelines can be developed and released.[171] Though it is irrational to suggest a fracking moratorium in North Dakota without scientifically significant evidence of groundwater contamination,[172] state lawmakers have the opportunity to follow a growing trend by increasing the regulatory requirements placed upon fracking operators.[173]

b. Increased Bonding Requirements

An EAF can potentially eliminate the likelihood of drilling in an overly fragile area, yet a spill or blowout will result in environmental damage no matter how hearty the surrounding vegetation.[174] As a result, once an application to drill has been approved by the NDIC, operators must submit a bond to ensure the availability of fiscal resources should reclamation due to an environmental incident be required.[175] These bond amounts are determined according to the drilling company's well quantity and depth,

168. Wiseman, s*upra* note 17, at 160-65 (indicating New York, Pennsylvania, Colorado, and New Mexico have strong fracking controls with enhanced environmental requirements); *see also* H.R. 3328, 82d Leg. (Tex. 2011) (requiring full disclosure of fracking chemicals from the oil and gas industry).

169. Wiseman, *supra* note 17, at 166.

170. *Id.*

171. Mireya Navarro, *N.Y. Assembly Approves Fracking Moratorium*, N.Y. TIMES GREEN (Nov. 30, 2010, 12:25 PM), http://green.blogs.nytimes.com/ 2010/11/30/n-y-assembly-approves-fracking-moratorium/.

172. There is no conclusive evidence fluid injection has a causal relationship with drinking water quality. COALBED METHANE STUDY, *supra* note 49, at 7-5 to 7-6. Therefore, the enactment of a moratorium in North Dakota would be irrational.

173. *See* Wiseman, s*upra* note 17, at 160-64 (stating New York, Pennsylvania, and New Mexico currently employ strict environmental permitting requirements, and Colorado is leaning towards an increased environmental focus); *see, e.g.*, 25 PA. CODE § 271.127 (2011); *Well Permitting Process*, *supra* note 161.

174. *See* Wiseman, s*upra* note 17, at 130 (indicating EPA employees who visited a methane coalbed development in Colorado observed areas where the vegetation was brown and dying).

175. *See* N.D. ADMIN. CODE 43-02-03-15 (2011).

ranging from $20,000 to $100,000.[176] Bonds are often debated[177] because while they do not make fracking any safer, they do ensure funds are available for complete reclamation of a drill site either once the well is no longer economically operable, or in the event there is a blowout.[178] North Dakota's bond amounts are not excessively low,[179] but higher requirements have successfully been applied in Pennsylvania state parks in an attempt to appease environmental activists concerned with the impacts of fracking.[180]

Much like Pennsylvania, increasing bond requirements in North Dakota could tighten fracking regulations without negatively effecting production. Because the bonds are conditioned upon regulatory compliance,[181] the bond contract is terminated and the funds are returned to the operator when the NDIC determines the well has been successfully plugged and the reclamation project has been completed.[182] The bond termination guidelines essentially reward operators who drill and frac in a manner imposing the least possible burden on the environment.[183] A bonding increase for fracking operators is warranted because a significant amount of pressure is applied to the wellbore in order to create resource funnelling fractures,[184] making fracking inherently more dangerous than conventional oil and gas recovery.[185] This increased risk should prompt the NDIC to implement a bonding premium on fracking operators to ensure there is sufficient capital available to return drill sites to pre-drill status in

176. *Id.* at 43-01-03-15(2). Single wells in excess of two thousand feet shall be bonded by $20,000 and shallower wells may be bonded in a lesser amount, while a "blanket bond" of $50,000 may be submitted to cover ten wells or $100,000 to cover more than ten wells. *Id.*

177. *See, e.g.*, Tim Webb, *Greenland Wants $2bn Bond from Oil Firms Before They Drill,* THE GUARDIAN, Nov. 12, 2010, at 34. Following BP's blow-out in the Gulf, the risky nature of off-shore drilling prompted Greenland's government to demand exorbitant bonding requirements to ensure clean-up costs are covered in the event of a blowout. *Id.*

178. U.S. GOV'T ACCOUNTABILITY OFFICE, BONDING REQUIREMENTS AND BLM EXPENDITURES TO RECLAIM ORPHANED WELLS 6, 8 (Jan. 2010), *available at* http://www.gao.gov/new.items/d10245.pdf.

179. *Compare* N.D. ADMIN. CODE 43-02-03-15(2) (requiring $20,000 for a single well, or a blanket bond for ten wells at $50,000), *with* 58 PA. STAT. ANN. § 601.215 (West 1996) (requiring $2,500 for a single well, or $25,000 blanket bond for all wells) *and* 16 TEX. ADMIN. CODE § 3.78(g)(1)(A)-(B) (2010) (requiring $25,000 blanket bond for ten or fewer wells, $50,000 for more than ten wells, or two dollars per foot drilled).

180. *DCNR Natural Gas Leasing Proposal,* PA. DEP'T OF CONSERVATION & NATURAL RES., http://www.dcnr.state.pa.us/gasleasing/ (last visited Dec. 29, 2011) (indicating bond requirements in Pennsylvania state parks have been increased from $2,500 per well to $25,000, plus a well plugging bond ranging from $5,000 to $100,000 per well).

181. N.D. ADMIN. CODE 43-01-03-15(4).

182. *Id.* at 43-02-03-15(7).

183. If the drill site is not properly plugged or reclaimed, "the surety shall satisfy the conditions or forfeit to the commission the face value of the bond." *Id.* at 43-02-03-15(4).

184. '300 Patent col. 4.

185. Anderson, s*upra* note 111, at 720 (stating "the lateral extent of fractures cannot be fully controlled," allowing some fluids to extend beyond the boundaries of the fracked well).

the event of a spill or blowout. The importance of increased fiscal resources for reclamation becomes blazingly apparent when incidents such as Arnegard, North Dakota's massive fire began during a fracking treatment.[186] Although steeper bonding requirements will not eliminate the prevalence of fires and blowouts at the well site, they may prompt operators to promote safe operating procedures, knowing that any environmental mishap could result in losing a substantial bond.

2. *Fracking Fluids*

Fracking fluids alone create a cause for concern due to their relatively unknown composition, made possible by federal exemptions under SDWA[187] and RCRA.[188] In adopting the federal government's minimalist legislation, North Dakota maintains fracking operators have a right to their trade secret when it comes to hydraulic fluids.[189] The NDIC only mandates disclosure when a spill occurs and deems an uncontrolled or unanticipated release of fluid a "spill," warranting disclosure only if it exceeds "one barrel total volume" or occurs off of the drill site.[190] These lax regulations give operators significant leeway to inject chemicals into the ground that heighten oil flow, regardless of their toxicity.[191] Admittedly, reporting every drop of fluid that falls from a rig would be costly and irrational, yet the fact citizens have no right to know what chemicals are being pumped into the environment, and essentially their backyards, seems equally absurd.

Disclosure has been made mandatory in Wyoming, and it appears the disclosures initially lobbied fiercely against by industry have caused few problems in the field.[192] Oil and gas giants, Halliburton and Range Resources, have even taken full disclosure a step further by launching websites that list the type and volume of chemicals their fracking solutions contain.[193] If industry continues to move towards full disclosure absent

186. Lauren Donovan & Christopher Bjorke, *Crews Battle Oil Well Fire Near Arnegard,* BISMARCK TRIBUNE, Mar. 8, 2011, at A1.

187. 42 U.S.C. § 300h(d)(1)(B) (2006).

188. Regulatory Determination for Oil and Gas and Geothermal Exploration, Development and Production Wastes, 53 Fed. Reg. 25,447 (July 6, 1988).

189. *See* N.D. ADMIN. CODE 43-02-03-16 (2011) (indicating fluid disclosure is not part of the general permitting guidelines).

190. *Id.* at 43-02-03-30. One "barrel" is equivalent to forty-two U.S. gallons. *Id.* at 42-02-03-01(4).

191. *See id*. at 43-02-03-16 (indicating fluid disclosure is not part of the general permitting guidelines).

192. Mead Gruver, *Wyo. Fracking Rules Take Effect with Few Problems*, BLOOMBERG BUSINESSWEEK, Sept. 24, 2010, http://www.businessweek.com/ap/financialnews/D9IE9EE00 htm.

193. RANGE RESOURCES, HYDRAULIC FRACTURING: MARCELLUS SHALE (July 2010), *available at* http://www rangeresources.com/rangeresources/files/6f/6ff33c64-5acf-4270-95c7-9e9

nationwide regulation,[194] the least the NDIC can do is request the information as a means of becoming familiar with the chemicals in order to provide increased emergency response capabilities and protection for citizens should a spill or blowout occur.[195] Like EAFs, fluid disclosure minutely increases the burden placed upon drilling operators and undeniably gives the NDIC invaluable information that will help to promote informed decision making when approving drilling applications.[196]

IV. CONCLUSION

In the heat of activism, logical thoughts can become clouded by the intense desire for revolution and change.[197] As a result, opponents of fracking must be cautious to avoid proposing extreme regulatory requirements merely because the injection of chemical additives into the ground *sounds* destructive. To date, there is no conclusive evidence fluid injection has a causal relationship with drinking water quality,[198] making complete eradication of fracking irrational. Instead, evidence of significant environmental damage due to non-injection activities such as improper disposal of fracking fluids, blowouts, surface discharge, and poorly sealed production wells[199] should be scrutinized and remedied through increased regulation. In a post-Exxon Valdez–and BP oil spill era, it is clear that mismanagement and mechanical failure have severe consequences.[200] Thus, *proactive* regulations that minimize risk are required, as *reactive*

91b963771.pdf; *Fluids Disclosure*, HALLIBURTON, http://www halliburton.com/public/projects/pubsdata/Hydraulic_Fracturing/fluids_disclosure html (last updated Dec. 6, 2011).

194. *Cf.* N.D. ADMIN. CODE. 43-02-03-16 (illustrating fluid disclosure is not required in North Dakota).

195. OHIO DEP'T OF NATURAL RES., *supra* note 13, at 7. Ohio currently requires operators to submit a well stimulation log listing all of the chemicals used to treat the well. *Id.* The information is used by emergency responders in the event a spill or accident occurs. *Id.*

196. The well stimulation log can be used by geologists during complaint investigations, as well. *Id.*

197. *See* JOEL BEST, DAMNED LIES AND STATISTICS: UNTANGLING NUMBERS FROM THE MEDIA, POLITICIANS, AND ACTIVISTS 5 (2001) (indicating information and statistics can become mangled and mutated to stir up outrage, create distortion of an event, and lead to poor policy decisions).

198. COALBED METHANE STUDY, *supra* note 49, at 7-5 to 7-6.

199. *See* Wiseman, *supra* note 17, at 136 (explaining the EPA has not studied the issues involving non-injection activities).

200. *See generally* Exxon Shipping Co. v. Baker, 554 U.S. 471 (2008) (determining damages after the Exxon oil spill); BOSSELMAN ET AL., *supra* note 4, at 412 (indicating human error and a lack of preparedness plays a role in the destructiveness of major oil spills); John Schwartz, *U.S. Sues BP and Others for Damages in Gulf Spill*, N.Y. TIMES, Dec. 16, 2010, at A30 (discussing monetary damages after the BP oil spill).

regulations promulgated in response to incident are entirely unacceptable and ultimately, more costly.[201]

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201. BOSSELMAN ET AL., *supra* note 4, at 412 (emphasis added). Following the Exxon Valdez spill, increased regulation passed the Senate without dissent, following years of floundering regulation proposals. *Id.*

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