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Applying Some Lessons from the Gulf Oil Spill to Hydraulic Fracturing

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APPLYING SOME LESSONS FROM THE GULF OIL SPILL TO HYDRAULIC FRACTURING

Heidi Gorovitz Robertson[†]

*“If the . . . oil boom is a classic Greek drama, the second act is starting now, and the prairie chorus is once again issuing a warning.”**

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* Edwin Dobb, *The New Oil Landscape*, NAT'L GEOGRAPHIC, Mar. 2013, at 29, 57.

INTRODUCTION

Hydraulic fracturing of shale is huge these days in Ohio—or at least it promises to be huge. News accounts, politicians, environmentalists, and business interests either laud it or revile it. Some say it will save Ohio's economy. Those with business interests in the hydraulic fracturing industry say it will usher in a new economy based on oil and gas exploration and production. They say an economic boom will trail them as they work to locate oil and gas entrapped in shale rock and entice it to the surface. They will tempt it to the surface using a controversial technology that, although not entirely new, is newly combined with another technology—horizontal drilling. Some insist that hydraulic fracturing will ruin Ohio's environment and endanger its citizens. They argue that the wells drilled for hydraulic fracturing are not sufficiently secure to protect the groundwater resources through which they will pass, and that shocks to the earth allegedly caused by high pressure underground injection of chemical laced waste water can cause earthquakes and other terrestrial disturbances.

Ohio is rushing towards hydraulic fracturing of horizontal wells at lightning speed, and some argue it has insufficiently considered and managed that rush in light of the potentially disastrous, albeit unlikely, consequences of groundwater contamination, explosion at wells or drilling sites, depletion of freshwater supply as high volumes are used in fracturing, and disposal of contaminated flowback water. Similarly, although drilling for oil from deepwater rigs was neither a new idea nor a new technology when the *Deepwater Horizon* blew out on April 20, 2010—killing 11 people, spewing tons of oil in the Gulf of Mexico, and sinking a \$50 million drilling rig—most deepwater wells that preceded it had not been drilled quite so deeply into the seafloor. Many of the technologies employed there were untested at such great depths, and regulation and enforcement had not kept pace with the advances in technology. This Article will consider just a few of the lessons identified through government and other studies that followed the *Deepwater Horizon* oil spill. It will consider how those lessons might be applied to Ohio's regulation of hydraulic fracturing in the hope that Ohio can avoid some of the same mistakes that arguably paved the way for the blowout in the Gulf.

There are many lessons to be learned from the Gulf Coast spill. Quite understandably, several government task forces have filled whole books with those lessons. This Article focuses on only a few of the lessons exposed in those reports. It will address some of the lessons that might apply as Ohio moves quickly to support and to regulate the developing shale oil and gas industry. In particular, this Article discusses three areas of potential concern: agency structure

and responsibility, inadequacies in research or follow through, and emergency planning and preparedness for disaster.¹

This Article begins by exploring conflicts of interest within the federal regulatory agency charged with oversight of off-shore drilling, the Minerals Management Service (MMS)—conflicts that made it virtually impossible for the agency to function rationally to prevent the disaster. For example, immediately following the blowout, it was abundantly clear that untenable internal conflicts of interest were present.² Broadly speaking, it was necessary to eliminate or reduce internal conflicts of interest wherein a single organization handled tasks that presented conflicting interests—such as, in the case of the former MMS, simultaneous responsibility over the leasing program, collection of royalties, and the creation and enforcement of drilling and operations regulations.³ Further within the broader subject area of agencies, this Article will briefly touch on inadequacies in agency funding that led to insufficient inspections, as well as the agency's disproportionate focus on revenue generation that likely led it astray from safety concerns. The Article will also explore these issues on a state level.

The second set of lessons this essay addresses concerns the unnecessary risks that arise in the face of known research inadequacies or insufficient follow-through on known risks. In the Gulf, for example, information was readily available to indicate a potentially dangerous pressure problem in the well, yet no one stopped the relentless forward march toward production to determine the root causes of the anomalous pressure “kicks” before it was too late.⁴ In addition, rapidly evolving technologies enabled drillers to reach deeper

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1. This Article will not address the many engineering lessons that figured prominently in the many post-disaster analyses of the blowout. Those lessons are creditably detailed in the numerous government reports on the incident. *See, e.g.*, BUREAU OF OCEAN ENERGY MGMT., REGULATION & ENFORCEMENT, U.S. DEP'T OF THE INTERIOR, REPORT REGARDING THE CAUSES OF THE APRIL 20, 2010 MACONDO WELL BLOWOUT (2011) [hereinafter JOINT INVESTIGATIVE REPORT]; NAT'L COMM'N ON THE BP DEEPWATER HORIZON OIL SPILL & OFFSHORE DRILLING, DEEP WATER: THE GULF OIL DISASTER AND THE FUTURE OF OFFSHORE DRILLING, REPORT TO THE PRESIDENT (2011) [hereinafter DEEP WATER].
 2. HENRY B. HOGUE, CONG. RESEARCH SERV., R41485, REORGANIZATION OF THE MINERALS MANAGEMENT SERVICE IN THE AFTERMATH OF THE DEEPWATER HORIZON OIL SPILL 1–2 (2010) (finding that three missions of the MMS, energy development, enforcement, and revenue collection, created internal conflicts of interest); *see also*, Mark Jaffe & David Olinger, “A Troubled Agency in Every Administration,” DENVER POST, June 6, 2010, at 1A.
 3. DEEP WATER, *supra* note 1, at 68.
 4. JOINT INVESTIGATIVE REPORT, *supra* note 1, at 5.

and deeper into the earth beneath the water, though there was not, in hindsight, sufficient understanding of the risks this presented in the given environmental circumstances.

Finally, in the third lesson, this Article addresses emergency preparedness. For example, despite some emergency response planning, there was insufficient research completed regarding how a major disaster cleanup plan would work in the environmental conditions present in the Gulf. There had been little attention paid to planning for worst-case scenarios. Although there appeared to be a serious safety culture on the rig, safety drills did not account for improbable but perilous circumstances and worst-case scenarios, such as total darkness and lack of reliable communication channels. Little was understood about the resources available in the area, the training of those local resources, or how certain cleanup technologies, like booms and dispersants, would function in the Gulf. The Article addresses the retrospectively apparent lack of clarity within and among the chains of command, and the insufficiency of resources to implement even the inadequate cleanup contingencies that were in place. As Ohio moves quickly towards the development of its shale oil and gas industry, it must learn from these lessons so that when disaster strikes, Ohio is clear on the answers to some important questions: What are the necessary safety protocols for a given emergency? Who is responsible for that emergency? And who is properly trained and prepared to manage that emergency?

These three lessons from the Gulf may inform Ohio and other states, and perhaps eventually the federal government, which will, either individually or collectively, be responsible for safely developing abundant resources in shale oil and gas. In *Forbes Magazine*, George P. Mitchell, who is widely credited with pioneering the use of hydraulic fracturing to break natural gas free from seemingly impermeable shale, suggested that hydraulic fracturing needs to be regulated by the Department of Energy, not just by individual states.⁵ His rationale was that “if they don’t do it right[,] there could be trouble There’s no excuse not to get it right.”⁶ To date, the bulk of regulation applicable to hydraulic fracturing of shale comes from

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5. Christopher Helman, *Billionaire Father of Fracking Says Government Must Step Up Regulation*, FORBES (July 19, 2012, 8:29 AM), <http://www.forbes.com/sites/christopherhelman/2012/07/19/billionaire-father-of-fracking-says-government-must-step-up-regulation>; see also Thomas L. Friedman, *Get It Right On Gas*, N.Y. TIMES, Aug. 5, 2012, at SR13 (discussing George Mitchell’s quote in Forbes that the Department of Energy should regulate hydraulic fracturing); Edwin Dobb, *The New Oil Landscape*, NAT’L GEOGRAPHIC, Mar. 2013, at 29, 57 (discussing George Mitchell’s call for “more transparency and tighter regulation”).
 6. Helman, *supra* note 5 (internal quotation marks omitted).

the states, not the federal government. As Mitchell suggested, this makes it even more important that the states do it right. As Ohio races headlong into the development of its shale oil and gas resources, it must be mindful both of this warning and of the vital lessons learned from the Gulf disaster.

The blowout in the Gulf presents countless lessons, many not directly applicable to the regulation of hydraulic fracturing in Ohio. The lessons are far too numerous to recount here, and several government reports have analyzed them over thousands of detailed pages in numerous studies.⁷ This Article focuses on only three immediate lessons that might help Ohio and other states as they endeavor both to encourage and to regulate the burgeoning shale oil and gas industry. In particular, the three lessons concern agency internal conflicts of interest, issues of research investigation and follow-through, and emergency planning and preparedness.

I. INTERNAL CONFLICT OF INTEREST WITHIN AN AGENCY

The Outer Continental Shelf Lands Act (OCSLA) authorizes the Secretary of the Department of the Interior to handle the regulation of resource development in the Outer Continental Shelf—in particular, the oil located deep beneath the Gulf of Mexico.⁸ The OCSLA dictates that the Secretary's regulatory authority includes the regulation of leasing, exploration, development, and production of resources in the covered area—including the Gulf of Mexico.⁹ Prior to the 2010 disaster, the Secretary of the Interior delegated that regulatory responsibility to the Department of the Interior's MMS.¹⁰ As such, MMS bore responsibility for regulating drilling, and it set forth the applicable regulations in 30 C.F.R. part 250. In particular, subpart 250 regulates most imaginable aspects of drilling operations,

7. See, e.g., JOINT INVESTIGATIVE REPORT, *supra* note 1; COMM. FOR ANALYSIS OF CAUSES OF THE DEEPWATER HORIZON EXPLOSION, FIRE, & OIL SPILL TO IDENTIFY MEASURES TO PREVENT SIMILAR ACCIDENTS TO THE FUTURE, NAT'L ACAD. OF ENG'G, & NAT'L RESEARCH COUNCIL, MACONDO WELL DEEPWATER HORIZON BLOWOUT: LESSONS FOR IMPROVING OFFSHORE DRILLING SAFETY (2011) [hereinafter NATIONAL ACADEMY REPORT]; DEEPWATER HORIZON STUDY GRP., FINAL REPORT ON THE INVESTIGATION OF THE MACONDO WELL BLOWOUT (2011).

8. Outer Continental Shelf Lands Act, 43 U.S.C. §§ 1331–1356a (2006).

9. 43 U.S.C. § 1334.

10. 30 C.F.R. § 250.101 (2011). After the disaster, MMS was reorganized and the responsibility for these regulations was delegated to the Bureau of Safety and Environmental Enforcement. See 30 C.F.R. § 250.101 (2012); HOGUE, *supra* note 2, at 4.

and MMS was responsible for promulgation and implementation of the regulations.¹¹

The United States Coast Guard is, and was at the time of the disaster, responsible for regulating the “safety of life and property on Outer Continental Shelf (OCS) facilities, vessels, and other units engaged in OCS activities.”¹² Drilling rigs and even some production platforms fall under the regulatory definition of “vessels.” The Coast Guard, therefore, was partially responsible for regulating their safe operation and was fully responsible for certifying their seaworthiness.¹³ Prior to the blowout, the most recent update to the Coast Guard’s marine-safety rules had been in 1982.¹⁴ The Coast Guard proposed new safety rules in 1999, triggering substantial industry opposition, and has not yet made those rules final.¹⁵ Furthermore, budgetary constraints and the terrorist attacks of September 11, 2001, shifted the Coast Guard’s focus to border and port security, such that it apparently passed on much of its responsibility for fixed-platform safety to the MMS in 2002.¹⁶

While the EPA has some independent regulatory authority over oil and gas operations—for example, water and air pollution related issues—there are also a significant number of exemptions that make identifying the EPA’s specific authority over these operations confusing. For example, the EPA is the lead federal response agency for oil spills occurring in inland waters, whereas the Coast Guard is the lead federal agency responsible for spills in coastal waters and deepwater ports.¹⁷ So, although the Coast Guard and EPA had some regulatory responsibilities, primary responsibility for regulating drilling operations lay with MMS, which controlled the promulgation

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11. See 30 C.F.R. § 250.500 (2011) (discussing the proper manner of conducting oil and gas well-completion operations in relation to protecting life, property, natural resources, national security, or the environment); 30 C.F.R. § 250.101 (2011) (delegating authority to MMS to regulate aspects such as equipment movement, emergency shutdowns, crew instructions, and reporting).
 12. 33 C.F.R. § 140.1 (2012).
 13. 46 C.F.R. § 2.01-1 (2012); see also, e.g., 46 CFR § 90.05-.35 (including “oil-rig-drilling-vessels” in definition of “miscellaneous vessels”).
 14. CURRY L. HAGERTY & JONATHAN L. RAMSEUR, CONG. RESEARCH SERV., R41262, DEEPWATER HORIZON OIL SPILL: SELECTED ISSUES FOR CONGRESS 37 (2010).
 15. Outer Continental Shelf Activities, 64 Fed. Reg. 68,416 (proposed Dec. 7, 1999) (to be codified at 33 C.F.R. pts. 140–147).
 16. Inspection Under, and Enforcement of, Coast Guard Regulations for Fixed Facilities on the Outer Continental Shelf by the Minerals Management Service, 67 Fed. Reg. 5912 (Feb. 7, 2002) (to be codified at 33 C.F.R. pt. 140).
 17. *Oil Spills*, EPA, <http://www.epa.gov/oilspill> (last visited Apr. 5, 2013).

and enforcement of applicable construction, operation, and safety regulations.¹⁸ Thus, MMS was writing and enforcing the regulations it created.

In addition to regulating, MMS handled the leasing, for oil exploration and production, of deepwater locations under federal control.¹⁹ Once locations were leased, MMS managed the permitting of exploration wells and the production wells that followed, and it also handled the revenue collection associated with the producing wells on leased land. So, MMS was handling leasing, regulation, *and* revenue collection.

This internally conflicting system was created by design. When then-Secretary of the Interior James Watt created MMS in 1982, he argued that MMS should “*promote* domestic energy supplies by dramatically expanding drilling on the outer continental shelf.”²⁰ He thought that to promote production most efficiently, it would be best to combine, within a single agency, the multiple functions that ultimately festered into fatally problematic internal conflicts of interest: leasing, regulatory oversight, responsibility for collection of revenues from leases, and royalties from producing wells.²¹ Hence, the agency was purposefully fashioned with a fully incorporated strain between environmental protection and safety and the marketing and execution of offshore oil and gas production.²² This tension is well documented and explained in the government’s Deep Water report, which traces the history of leasing, the history of the rise of efforts towards environmental protection, and the original and growing conflict between them.²³

Soon after the April 22, 2010, blowout of the Macondo well, then-Secretary of the Interior Ken Salazar announced his intent to “strip MMS’s safety and environmental enforcement responsibilities away from its leasing, revenue collection, and permitting functions.”²⁴ The reason for this dismantling of the federal agency that had long handled all of these functions was the debilitating conflict of interest that became obvious in the aftermath of the disaster. The three ultimately conflicting missions of the agency were, as articulated by the Department immediately following the spill: OCS resource management (leasing), safety and environmental regulation and

18. DEEP WATER, *supra* note 1, at 68.

19. HOGUE, *supra* note 2, at 2.

20. DEEP WATER, *supra* note 1, at 56 (emphasis added).

21. *Id.*

22. *Id.*

23. *Id.* at 60.

24. *Id.* at 55.

enforcement (enforcement), and revenue collection.²⁵

Leasing, enforcement, and revenue collection were conflicting interests because the agency, which was working to bring more revenue into U.S. government coffers, would not have the incentive to make sound leasing or enforcement decisions that might be in conflict with its revenue-raising goals. Following the disaster, what had once been one agency with internally conflicting functions would become three separate entities: the Bureau of Ocean Energy Management, the Bureau of Safety and Environmental Enforcement, and the Office of Natural Resources Revenue.²⁶ No longer would the fox (the agency that collected fees and royalties from oil and gas producers) live right within the hen house (the agency that granted drilling leases and permits, and wrote and enforced safety and environmental regulations). Still, although this division of MMS functions was an improvement, the President's Commission found it insufficient, and recommended the creation of an entirely "independent agency within the Department of the Interior with enforcement authority to oversee all aspects of offshore drilling safety (operational and occupational)."²⁷

This Part illustrates the former-MMS's internal conflicts of interest by examining MMS's key functions in leasing, regulatory oversight, and the collection of revenues and royalties from leases and productive wells. It then explores the regulatory structure in Ohio to determine whether Ohio's structure presents the same, or similarly problematic, regulatory concerns as were present in the Gulf.

A. *Leasing*

This Section briefly describes the federal leasing system through which the U.S. government facilitated oil exploration in the Gulf of Mexico. It then compares the system in Ohio with respect to leasing of land for exploration and development of shale resources.

1. Leasing of Drilling Rights in Federal Waters

In 1954, President Eisenhower's Department of the Interior granted the first lease for exploratory offshore drilling operations in the United States.²⁸ Others soon followed.²⁹ The 1954 lease produced about \$116

25. HOGUE, *supra* note 2, at 2–3.

26. DEEP WATER, *supra* note 1, at 55 (citing Press Release, Dep't of the Interior, Salazar Divides MMS's Three Conflicting Missions (May 19, 2010), *available at* <http://www.doi.gov/news/pressreleases/Salazar-Divides-MMSs-Three-Conflicting-Missions.cfm>).

27. *Id.* at 256. For the President's Commission's recommendations on this point, see *id.* at 257–59.

28. Tyler Priest, *Auctioning the Ocean: The Creation of the Federal Offshore Leasing Program, 1954-1962*, in 1 PAPERS ON THE EVOLVING OFFSHORE INDUSTRY, HISTORY OF THE OFFSHORE OIL AND GAS INDUSTRY IN SOUTHERN LOUISIANA 93, 97 (Minerals Mgmt. Serv., 2008).

million in bonuses for the Federal Treasury, and these early leases quickly yielded \$129.5 million in revenue, which were swiftly followed by another set of leases yielding an additional \$23 million.³⁰ Clearly, this was to become a promising source of federal revenue. But as the push for increased U.S. energy development continued, urged on by the oil embargo of 1973, environmentalists hoped that increased development would not come at the cost of the environment.³¹ Still, the new federal laws specifically enacted to facilitate increased U.S. oil production exhibited this now-common tension between encouraging production and protecting safety and the environment. The laws included some stringent environmental protections and also plenty of room in the decision-making processes for differing viewpoints. In contrast, knowing that the enactment and judicial enforcement of the National Environmental Policy Act had led to some successful challenges to leases,³² those who wanted fast and efficient enabling of U.S. oil and gas production pushed to enact federal laws in which a quest for environmental protection would not subdue oil and gas production.

By 1978, Congress was busily enacting legislation to transform the leasing process. To do this, it passed the OCSLA Amendments, which included a new leasing process, essentially the process in effect today.³³ That act, like many other federal laws, included built-in tensions between environmental protection and safety, and revenue generation and productivity.³⁴

The amendments set forth a plan for the development of a five-year program for leasing.³⁵ This plan included preparation for the leasing of specific sites, requirements for exploration plan approvals,

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29. *Id.* at 97–98; MINERALS MGMT. SERV., U.S. DEP'T OF THE INTERIOR, LEASING OIL AND NATURAL GAS RESOURCES: OUTER CONTINENTAL SHELF 49–50 (2006).
 30. Priest, *supra* note 28, at 97–98; *see also* LEASING OIL AND NATURAL GAS RESOURCES, *supra* note 29, at 49.
 31. *See* DEEP WATER, *supra* note 1, at 58–60 (discussing the development of heightened awareness towards environmental issues surrounding offshore drilling).
 32. *See, e.g.*, Natural Res. Def. Council v. Morton, 458 F.2d 827, 836–37 (D.C. Cir. 1972) (denying the Secretary of the Interior's motion for summary reversal because the proposed leases failed to include a presentation of the environmental risks posed by the leases, as required by the National Environmental Protection Act).
 33. *Compare* Outer Continental Shelf Lands Act, Pub. L. No. 95-372, 92 Stat. 629 (1978), *with* Outer Continental Shelf Lands Act, 43 U.S.C. §§ 1331–1356a (2006).
 34. DEEP WATER, *supra* note 1, at 60 (citing Outer Continental Shelf Lands Act, Pub. L. No. 95-372, 92 Stat. 629).
 35. 43 U.S.C. § 1344.

and approvals for development and production plans.³⁶ While the revised statute spoke to environmental standards as relevant to the secretary's permitting decisions, it left substantial space for the Secretary to make decisions on other grounds.³⁷ For example, the statute requires the Secretary of the Interior to "obtain a proper balance between the potential for environmental damage, the potential for discovery of oil and gas, and the potential for adverse impact on the coastal zone."³⁸ It also requires the Secretary to study the "environmental impacts on the human, marine, and coastal environments" of activities on the outer continental shelf.³⁹ It requires the Secretary of Homeland Security (because the Coast Guard operates under the Department of Homeland Security) to promulgate safety regulations using "the best available and safest technologies which the Secretary determines to be economically feasible, wherever failure of equipment would have a significant effect on safety, health, or the environment."⁴⁰

The problems with these seemingly protective pronouncements, of course, are their internal flexibility—"adverse effect" is highly interpretable, as is "economically feasible." In addition, the statute provides an even more explicit escape clause, stating that the Secretary need not follow the safety requirements "where the Secretary determines that the incremental benefits are clearly insufficient to justify the incremental costs of utilizing such technologies."⁴¹ This gives the Secretary substantial wiggle room in wrestling with the already built-in tensions between environmental and safety precautions on the one hand, and oil and gas productivity and revenue generation on the other. This basic tension, accompanied by flexibility in regulation and ever-present incentives to promote production and raise revenue, places the Secretary in a difficult spot. Although the Secretary is supposed to balance environmental protection and safety with production and revenue, it is easy to see how the best laid plans might be derailed.

The statute that governs leasing also appears to prefer productivity to safety and environmental protection by including an exception for development and production of Gulf of Mexico leases from the basic requirement that applications for production and

36. *Id.*; see also DEEP WATER, *supra* note 1, at 61 (depicting graphically the Outer Continental Shelf leasing and development process over a five-year program).

37. DEEP WATER, *supra* note 1, at 62.

38. 43 U.S.C. § 1344(a)(3).

39. 43 U.S.C. § 1346(a).

40. 43 U.S.C. § 1347(b).

41. *Id.*

development be based on, and consistent with, the potential lessee's submitted and approved "development and production plan."⁴² This exception is critically important because it is within those development and production plans that the law requires lessees to set forth "the environmental safeguards to be implemented."⁴³ Additionally, a NEPA environmental review requirement would be triggered based on the Secretary's review of a lessee's development and production plan because the statute specifically states that this must happen.⁴⁴ The Secretary must declare the approval of a development and production plan in a given area, at least once, to be a major federal action, which would, of course, trigger environmental review under NEPA.⁴⁵ If the lessee is exempted from submitting a development and production plan, there is no plan available that might be declared a major federal action, and therefore, no required environmental review under NEPA.⁴⁶ According to the President's Commission, these exemptions and exceptions grew out of some major horse trading and compromise, which is of course not unusual in the creation of legislation.⁴⁷ Over the next decades, congressional action and court decisions led to an even stronger preference for drilling in the Gulf over other regions of the country.⁴⁸

The regulation of offshore drilling has always been embroiled in politics, early horse trading notwithstanding. Political pressures have remained intertwined with oil and gas development as the industry matured, not least when MMS was created under President Reagan's administration through Secretary of the Interior James Watt. Watt focused on speeding up the leasing process and vowed to make a

42. 43 U.S.C. § 1351(a)(1). As noted in the President's Report, the exception applies to production and development leases, not to those for exploration. Exploration plans are required of all lessees before they begin exploratory drilling. *See DEEP WATER*, *supra* note 1, at 62 (citing 43 U.S.C. § 1340).

43. 43 U.S.C. § 1351(c)(3).

44. 43 U.S.C. § 1351(e)(1).

45. *Id.*

46. These provisions are further complicated by the language that allows the Secretary to reinstate the development and production plan requirements for certain portions of the Gulf of Mexico—the eastern portion abutting Florida—but leaving the central and western Gulf outside the plan and review requirements. 43 U.S.C. § 1351(l); *see also DEEP WATER*, *supra* note 1, at 62.

47. *See DEEP WATER*, *supra* note 1, at 62–63 (noting that "the Act reflected a carefully calibrated political compromise").

48. *Id.* at 66–67 ("What began as a policy allowing offshore drilling in the Gulf under a more relaxed regulatory regime than applied elsewhere gradually became a policy of allowing offshore drilling, as a practical matter, almost *only* in the Gulf.").

billion acres of the outer continental shelf readily available.⁴⁹ He famously declared at a press conference, “We will offer one billion acres for leasing in the next five years. We will not back away from our plans to have 42 lease sales.”⁵⁰ MMS was born into this atmosphere of intense focus on the increase of production and the revenue increases that accompany it, and its handling of leases in federally controlled waters was no exception.

2. Leasing in Ohio

With respect to drilling in the Gulf, MMS, a federal agency, handled the leasing of drilling rights to federally controlled underwater lands.⁵¹ The relevant statutes encouraged that agency to lease land and to use those leases strategically and enthusiastically to boost U.S. oil and gas production and bring in revenue to the U.S. Treasury and economy. The laws were written such that leases in the Gulf were not subject to certain requirements that would have slowed down the leasing and production processes and therefore the revenue stream.⁵²

Ohio, on the contrary, has a relatively small amount of federally controlled land to lease for oil and gas development. It has the Wayne National Forest⁵³ in southeastern Ohio, and a single, small national park, Cuyahoga Valley National Park.⁵⁴ Administration of oil and natural gas activities in the Wayne National Forest is administered by the U.S. Department of Agriculture’s Forest Service, under the Federal Land Policy and Management Act of 1976⁵⁵ and the Wayne National Forest Land and Resources Management Plan (Forest Plan).⁵⁶ The Wayne National Forest land includes a mix of federally owned mineral rights (41 percent—493 active wells) and privately owned mineral rights (59 percent—790 active wells).⁵⁷ According to the Forest Service, as of June 2012, the Wayne National Forest has

49. *Id.* at 63.

50. *Id.*

51. 30 C.F.R. § 250.101 (2011); *see also* HOGUE, *supra* note 2, at 5.

52. 43 U.S.C. § 1351(a)(1).

53. WAYNE NAT’L FOREST, <http://www.fs.usda.gov/wayne> (last visited Apr. 5, 2013).

54. CUYAHOGA VALLEY NAT’L PARK, www.nps.gov/cuva/index.htm (last visited Apr. 5, 2013).

55. Federal Land Policy and Management Act of 1976, Pub. L. No. 94-579, 90 Stat. 2743.

56. FOREST SERV., U.S. DEP’T OF AGRIC., FINAL REVISED LAND AND RESOURCE MANAGEMENT PLAN, WAYNE NATIONAL FOREST (2006).

57. Forest Serv., U.S. Dep’t of Agric., *Administration of Oil and Natural Gas Activities*, WAYNE NAT’L FOREST, <http://www.fs.usda.gov/detail/wayne/home/?cid=stelprdb5376502> (last visited Apr. 5, 2013).

1,283 active vertical wells—in the federally and privately owned minerals categories combined.⁵⁸

As of June 6, 2012, there was no Utica or Marcellus shale drilling occurring and none proposed for the Wayne National Forest.⁵⁹ Still, the federally owned land in the Wayne National Forest is available for lease, by nomination, or expression of interest to the Bureau of Land Management (BLM).⁶⁰ Nominations could be made for Utica or Marcellus shale development in the same way they are made for any other type of oil and gas development on federal land.⁶¹ If a nomination or expression of interest was made, the BLM would then evaluate the requested land for availability.⁶² To evaluate land for availability, the BLM assesses the property rights (land and mineral) to the land, checks for restrictions on its use, and determines its availability for lease.⁶³ It prepares a competitive bid package and posts a public notice that the land will be made available for lease.⁶⁴ After a lessee is selected, the lessee must engage in a process of planning, evaluation, environmental review, and public involvement during the course of development.⁶⁵

The federal government owns more than 90 percent of the land in the Cuyahoga Valley National Park, and unlike the Wayne National Forest, National Park lands, with few exceptions, are not available for mineral lease. That said, the Cuyahoga Valley National Park includes some privately owned land within its boundaries as well as some land for which the park owns the surface rights but not the mineral rights. In those instances, a potential mineral developer would have to cross park land to develop mineral rights, and would have to comply with park rules and regulations regarding that process. In particular, they would have to “submit a plan of operation, listing all of the details and the potential impacts of hydraulic fracturing and the specific

58. *Id.*

59. Forest Serv., U.S. Dep’t of Agric., *Frequently Asked Questions on Oil and Gas Management*, WAYNE NAT’L FOREST, <http://www.fs.usda.gov/detail/wayne/home/?cid=stelprdb5376538> (last visited Mar. 28, 2013).

60. *Id.*

61. *Id.*

62. *Federal Oil and Gas Leasing and Development in the Eastern States*, BUREAU OF LAND MGMT, U.S. DEP’T OF INTERIOR, http://www.blm.gov/es/st/en/prog/minerals/about_minerals.html (last visited Apr. 5, 2013).

63. *Id.*

64. *Id.*

65. *Id.*

chemicals used.”⁶⁶ According to Park biologist Meg Plona, “there would have to be an environmental assessment, and the plan would have to be approved by the National Park Service.”⁶⁷

Significantly, and in contrast to the land and mineral leasing systems run by the federal government on federal land in Ohio, most Ohio drilling is done on private land, state-owned land, or lands owned by local government entities.⁶⁸ The vast majority of lands being leased for drilling and exploration, therefore, are not leased by any agency, state or federal. Unlike the situation in the Gulf, landowners are not negotiating with an agency for their leases. Instead, the drilling companies negotiate leases and rights to drill directly with landowners through brokers called “landmen.”⁶⁹

The Ohio Department of Natural Resources (ODNR) provides some limited advice for landowners to assist them when entering into leases for drilling on their land.⁷⁰ But, other than imposing requirements regarding issues such as drilling unit size and notification of neighbors, the Ohio agency does not control leasing.⁷¹ There are many problems surrounding the leasing of land for shale oil and gas development in Ohio. Eastern Ohio landowners are being approached by landmen to arrange for leasing the mineral rights to their land. The landowners may be uninformed about the true value of the resources under their land, unrepresented with respect to their financial interests and legal rights, out resourced, outmaneuvered, and taken advantage of. But unlike the circumstances of conflicting internal authority that was evident in the Gulf, in Ohio, the agency with primary control of shale oil and gas development, the ODNR,

66. John Funk, *Shale Gas: Drilling Down, Cuyahoga Valley Landowners Get Offers to Lease*, PLAIN DEALER (Cleveland), Mar. 15, 2012, at A1 (quoting Meg Plona, a biologist with the Park’s resource management division).

67. *Id.* (quoting Meg Plona).

68. DIV. OF OIL & GAS RES. MGMT., OHIO DEP’T OF NATURAL RES., OHIO OIL AND GAS SUMMARY 1 (2011) [hereinafter MCCORMAC REPORT].

69. *See, e.g., About Us*, N. APPALACHIAN LANDMAN’S ASS’N, <http://www.nalalandman.org/about-us> (last visited Apr. 5, 2013) (“Landmen link landowners with the companies and people who want to pay them for rights to energy and minerals on their properties.”).

70. General Information of *Leasing for Oil and Gas in Ohio*, OHIO DEP’T OF NATURAL RES., <http://www.dnr.state.oh.us/mineral/landowner/tabid/17732/Default.aspx> (last visited Apr. 5, 2013); *see also* OHIO DEP’T OF NATURAL RES., OIL & GAS LEASING IN OHIO, *available at* <http://ohiodnr.com/Portals/11/Pdf/leasing-fact-sheet2.pdf>.

71. Frequently Asked Questions about *Leasing for Oil and Gas in Ohio*, OHIO DEP’T OF NATURAL RES., <http://oilandgas.ohiodnr.gov/Citizens/Leasing-Information.aspx/#tabname3> (last visited Mar. 29, 2013) (“The Division of Oil & Gas Resources Management does not get involved in contractual differences between the landowner and the producer.”).

does not have responsibility over leasing decisions. Because the ODNR does not control leasing, it also collects no revenue from leases and thus does not face the conflicts of interest that existed within MMS.

B. Revenue Generation

This Section explores MMS's role in revenue generation with respect to the oil production taking place in the Gulf and shows that MMS's revenue-collecting role helped create an untenable internal conflict of interest within that agency. It then describes and compares the role of Ohio agencies in terms of revenue generation from the development of shale oil and gas to determine whether the Ohio regulatory scheme presents a similar problem.

1. Revenue Generation by the Federal Agency

Prior to the birth of MMS, the Department of the Interior's BLM had collected revenues for natural resources leases on federal land.⁷² But after finding problems with BLM's collection efforts, then-Secretary Watt incorporated that revenue-collection function within the new agency, MMS.⁷³ After this incorporation, MMS was carrying out two major, potentially conflicting, functions with regard to offshore drilling—regulatory oversight and revenue collection. MMS's revenue-generating functions came through its collection of upfront payments for leases and royalties on productive wells.⁷⁴ MMS received some direct congressional appropriations,⁷⁵ and in addition, MMS obtained revenue from some other congressionally authorized continental shelf rental receipts, inspection fees for OCS facilities, and cost recovery fees. In fact, the agency took in an average of \$13 billion in minerals revenue.⁷⁶ Prior to its reorganization, MMS had collected over \$210 billion in revenues from its management of oil and gas, metals, and other programs.⁷⁷ Between 2005 and 2007, it “completed

72. H.R. REP. NO. 97-942, at 40 (1983).

73. DEEP WATER, *supra* note 1, at 64.

74. Act of Dec. 30, 1982, Pub. L. No. 97-394, 96 Stat. 1966, 1973 (appropriating \$196,506,000 to MMS for leasing and royalty management).

75. *Id.*

76. Press Release, U.S. Dep't of the Interior Office of the Sec'y, Salazar Divides MMS's Three Conflicting Missions (May 19, 2010), <http://www.doi.gov/news/pressreleases/Salazar-Divides-MMSs-Three-Conflicting-Missions.cfm>.

77. *Id.*; see also Reorganization of Title 30: Bureaus of Safety and Environmental Enforcement and Ocean Energy Management, 76 Fed. Reg. 64,432 (Oct. 18, 2011).

1,080 audits of energy firm royalty payments.”⁷⁸ “Between August 1990 and January 2008, MMS initiated 623 civil penalty reviews that resulted in 498 civil penalties for which the agency collected \$18,591,792 in fines.”⁷⁹

The program also generated U.S. Treasury revenues by receiving oil and gas royalties in kind (in the form of product), rather than in cash, and competitively selling the commodities in the marketplace. The MMS retained a portion of the revenues generated through royalty-in-kind operations to cover related administrative expenses. During Fiscal Year 2007, royalty-in-kind operations generated an additional \$63 million in benefits for the U.S. Treasury. So, like the parties it was overseeing, MMS was selling oil in the marketplace. This effort was effective. Since its inception in 1982, MMS had disbursed approximately \$200 billion to federal, state and American Indian accounts.⁸⁰

To bring in continually greater revenues, of course, the oil and gas industry needed to move drilling operations further offshore to more productive fields, and MMS needed to facilitate this result in order to continue generating abundant revenues.⁸¹ To facilitate revenue generation from the same entities for which one is responsible for oversight certainly breeds conflicting interest. So, at the same time that MMS was raking in cash for the federal treasury, it was also controlling the leasing of offshore drilling sites, promulgating the rules that governed those offshore drilling, and handling the inspections of drilling operations.

2. Revenue Generation in Ohio

In Ohio, the big topic of conversation concerning oil and gas revenues focuses on severance taxes. Ohio severance taxes—those levied when Ohio’s natural resources are separated, or severed, from Ohio—are collected by the Ohio Tax Commissioner.⁸² The Commissioner’s office is mainly, though not completely, unrelated to

78. Miles Moffeit, *Minerals Division Workers Punished*, DENVER POST, Nov. 23, 2008, http://www.denverpost.com/news/ci_11047268. Further, from 2001 to 2006 “MMS’s minerals revenue program accounted for . . . \$36 billion.” Press Release, Bureau of Ocean Energy Management, MMS Moves to Strengthen Compliance Effort (Dec. 6, 2006).

79. Press Release, *supra* note 76.

80. MINERALS MGMT. SERV., U.S. DEP’T OF INTERIOR, BUDGET JUSTIFICATIONS AND PERFORMANCE INFORMATION FISCAL YEAR 2010, at 11 (2010).

81. *See* DEEP WATER, *supra* note 1, at 56 (discussing the consequences of increasing revenue by drilling further offshore).

82. TAX ANALYSIS DIV. & THE COMMC’NS OFFICE, OHIO DEPARTMENT OF TAXATION 2011 ANNUAL REPORT 10, 13 (2011) (collection overseen by the Excise, Motor Fuel and Public Utilities Tax division).

the regulatory workings of the ODNR.⁸³ And ODNR's Division of Oil and Gas is not completely free from collecting and handling revenue, as it has statutory authority to collect fees based on oil and gas development and operation.⁸⁴ Although most of the Ohio Revised Code sections allow for the collection of fees for permits or inspections, the cost recovery assessment in section 1509.50 is tied to the Ohio severance taxes assessed via Ohio Revised Code sections 5749.06 and 5749.02.⁸⁵ Although the statute calls for this "assessment" to be "treated the same and equivalent for all purposes as the taxes levied on the severance of oil and gas," the statute concludes that "the assessment imposed by this section is not a tax."⁸⁶ According to the statute, money received through these sections will be paid to the newly created oil and gas well fund.⁸⁷ The fund also receives income from civil penalties and severances taxes.⁸⁸ Money in the fund is to be used for the Division's expenses associated with administering Revised Code Chapters 1509 and 1571 (dealing with underground storage of gas), and for other expenses that are critical and necessary for the protection of human health and safety and the environment related to oil and gas production.⁸⁹ So, the statute indicates that although the Division must use its revenues to sustain itself in carrying out its assigned duties, "expenses of the division in excess of the moneys

83. *See id.* at 13 (showing that the Commissioner's office oversees severance and natural gas distribution taxes).

84. *See* OHIO REV. CODE ANN. § 1509.02 (West 2012) (creating an oil and gas well fund). Various sections of the Ohio Revised Code also allow the Division of Oil and Natural Gas to collect funds. *See id.* § 1509.06(G) (permit fees); *id.* § 1509.061 (request to revise existing tract); *id.* § 1509.062(E) (temporary inactive well status); *id.* § 1509.13(D) (permit to abandon); *id.* § 1509.22(D) (storage or disposal of brine); *id.* § 1509.222(A)(2) (registration certificate and identification number for transportation of brine); *id.* § 1509.34 (priority liens); *id.* § 1509.50 (oil and gas regulatory cost recovery assessment).

85. *Id.* § 1509.50(A) ("An owner shall pay the assessment in the same manner as a severer who is required to file a return under section 5749.06 of the Revised Code. . . . Except for an exempt domestic well, the assessment imposed shall be in addition to the taxes levied on the severance of oil and gas under section 5749.02 of the Revised Code.").

86. *Id.* § 1509.50(D).

87. *Id.* § 1509.02 ("All moneys collected by the chief pursuant to sections 1509.06, 1509.061, 1509.062, 1509.071, 1509.13, 1509.22, 1509.221, 1509.222, 1509.34, and 1509.50 . . . shall be deposited into the state treasury to the credit of the oil and gas well fund, which is hereby created.").

88. *Id.*

89. *Id.*

available in the fund shall be paid from general revenue fund appropriations to the department.”⁹⁰

It is this last section that is troubling, especially in light of the issues that occurred in the Gulf. ODNR’s Division of Oil and Gas is, to a not insubstantial extent, collecting funds to sustain itself, and this allows a potentially dangerous conflict of interest to persist within the agency, as it did in the MMS.

As mentioned above, Ohio has been focused on the issue of severance tax revenues generated through oil and gas development. On June 11, 2012, Ohio Governor John Kasich signed Amended H.B. 487 into law.⁹¹ The new law initially proposed to impose higher severance taxes on horizontal wells than were previously imposed.⁹² However, this section was removed from the bill before H.B. 487 was signed into law. The bill earmarked an incremental portion of the severance taxes on horizontal wells for personal income tax relief. Because the incremental tax benefit was tied to the price of natural gas, which can swing substantially, it is unknown what level of impact this tax would have had on personal income taxes in Ohio. Ohio Governor John Kasich attempted to add this section into law through a different bill, H.B. 59, but this effort to achieve higher severance taxes also failed. There has been some indication that there are new efforts to impose a statewide severance tax, but no further official action has occurred.⁹³

The issue has been controversial, mainly because of the plan to spend the severance tax revenue on general income tax reductions rather than anything specifically related to environmental protection, shale development, or marketing of shale development, or, really, anything related to the resources themselves. Still, regardless how the money would have been spent, what matters here is how the tax is ultimately determined and collected.

90. *Id.*

91. Press Release, Ohio Governor John R. Kasich, *Kasich Signs Three Bills into Law* (June 11, 2012), <http://www.governor.ohio.gov/Portals/0/pdf/news/06%2011%2012%20Kasich%20Signs%20Main%20MBR%20Energy%20and%20Gaming%20Bill.pdf>.

92. ERNST & YOUNG LLP, *ANALYSIS OF OHIO SEVERANCE TAX PROVISIONS OF H.B. 487*, at 1 (2012).

93. Brent Larkin, *There’s No Logical Argument Against Kasich’s Proposed Fracking Tax*, PLAIN DEALER (Cleveland), Mar. 31, 2013, http://www.cleveland.com/opinion/index.ssf/2013/03/theres_no_logical_argument_ag_a.html; see also Jim Siegel & Joe Vardon, *Kasich’s Tax Proposals, Medicaid Expansion Out in House GOP Plan*, COLUMBUS DISPATCH, Apr. 19, 2013, <http://www.dispatch.com/content/stories/local/2013/04/09/Ohio-GOP-kills-Kasichs-tax-plan.html>.

The new law would have increased Ohio's severance tax from 0.5% (or 0.8% depending on the type of well) to 2.7%.⁹⁴ Still, even with the increased rate, according to the accounting firm Ernst & Young, Ohio's effective tax rate would be 16% to 40% lower (depending on what the well is producing) than other states' severance taxes.⁹⁵ Currently, Ohio taxes oil at a rate of 20 cents per barrel and natural gas at a rate of 3 cents per thousand cubic feet.⁹⁶ This total rate includes both a severance tax and a cost recovery assessment.⁹⁷ The new law would have changed the system a bit.⁹⁸ It divides wells into two categories, by type of well: "horizontal wells" and "other wells," which is a catch-all category that includes anything that is not horizontal.⁹⁹ Oil that does not come from a horizontal well will still be taxed at the current 20 cent rate.¹⁰⁰ The new law would have changed the rate for gas from wells in the "other" category. It would have been taxed at the lesser of the current rate or 1% of the market value.¹⁰¹ This cap would have insured that taxes on gas from "other" wells will not be increased.

Horizontal wells are in another category. The new law would have imposed higher taxes on both oil and gas from these wells. It divided this category into wet gas and dry gas, with wet gas and oil being taxed at 4% of market value, phased in from an initial rate of 1.5% for up to two years.¹⁰² Dry gas will be taxed at a rate of 1% of market value.¹⁰³ Low-producing wells are exempt from the Ohio severance tax.¹⁰⁴

Despite the fact that the increased severance taxes were not enacted, the rates are legislated, not determined by the ODNR Division of Oil and Gas. Severance taxes are neither determined nor collected by the same agency that regulates shale oil and gas development, so there appears, at first look, to be no direct or internal conflict of interest there. That said, the oil and gas regulatory enforcement assessment, the rates for which are tied directly to the

94. ERNST & YOUNG LLP, *supra* note 92, at 2.

95. *Id.*

96. *Id.* at 3.

97. *Id.*

98. *Id.*

99. *Id.*

100. *Id.*

101. *Id.*

102. *Id.*

103. *Id.*

104. *Id.*

severance tax system, is collected by the Division for its own sustenance. This apparent conflict warrants further study.

C. *Enforcement*

The next lesson from the Gulf that might help improve Ohio's efforts towards the safe and productive development of its shale oil resources concerns enforcement (and creation) of safety regulations. To support the assertion that the MMS was enforcing regulations against the same industry from which it was both generating revenue and encouraging production, this Section describes some issues that arose in MMS's exercise of its enforcement responsibilities in the Gulf. The premise is that conflicts of interest, in part, led to subpar enforcement, which may well have contributed to the events that enabled disaster. This Section then examines enforcement efforts in Ohio.

1. Federal Enforcement in the Gulf

The federal government, through the U.S. Department of the Interior, has broad regulatory authority over U.S. natural resources, such as the oil beneath the Gulf of Mexico. The federal government controls the leasing, exploration, and development of oil and gas on the OCS.¹⁰⁵ As discussed above, the Secretary of the Interior had delegated all of these authorities to MMS at the time of the Gulf disaster.¹⁰⁶ This means that the federal government also controlled the manner in which these activities were carried out and the rules that applied to them concerning safety and environmental protection. Through MMS, the federal government issued books of regulations pertaining to the operations and safety procedures applicable at the enormous floating drilling and production terminals. In particular, MMS promulgated “hundreds of pages of technical requirements for pollution prevention and control, drilling, well-completion operations, oil and gas well-workovers (major well maintenance), production safety systems, platforms and structures, pipelines, well production, and well-control and -production safety training.”¹⁰⁷ Under the OCSLA, lease and permit holders must maintain their facilities “in compliance with occupational safety and health standards” and “free

105. See DEEP WATER, *supra* note 1, at 67 (“The federal government has never lacked the sweeping authority required to control whether, when, and how valuable oil and gas resources located on the outer continental shelf are leased, explored, or developed.”).

106. See JOINT INVESTIGATIVE REPORT, *supra* note 1, at 157 (discussing the powers of MMS at the time of the disaster); *supra* note 10 and accompanying text.

107. DEEP WATER, *supra* note 1, at 68 (citing 30 C.F.R. pt. 250 (2010)).

from recognized hazards to employees.”¹⁰⁸ They must “maintain all operations . . . in compliance with regulations intended to protect persons, property and the environment.”¹⁰⁹ Clearly, something went wrong.

Additionally, under the OCSLA, MMS was required to enforce the regulations in 30 C.F.R. part 250,¹¹⁰ and therefore the agency required annual and periodic inspections, some scheduled and some unannounced, to assure compliance.¹¹¹ Inspections were to cover “pollution, drilling, well completion, production, crane, electrical, and personal safety.”¹¹² MMS inspections included evaluation of documents as well as on-site inspections and even some testing of equipment.¹¹³ Records inspections might include a look at surveys, records of blowout preventer tests and inspections, documentation of pressure tests, and records of condition of drilling mud.¹¹⁴ Visual inspections of the rig might include inspection of drilling fluid handling areas, general safety conditions, safety valves, electrical grounding, and more.¹¹⁵ Actual testing of equipment in a routine inspection would include testing of many specific safety devices and their operability.¹¹⁶ MMS maintained a checklist for these inspections, called a Potential Incident of Non-Compliance (PINC) list, in an effort to achieve some consistency of inspections nationwide.¹¹⁷ MMS inspectors can write up violations and issue fines for noncompliance.¹¹⁸ At the time of the blowout, the Joint Investigative Panel determined there was no PINC on the inspectors’ list that would require the inspectors to regularly verify that the major inspection requirements had been met during the drilling inspections.¹¹⁹ In particular, 30 C.F.R. § 250.446(a) requires an operator to conduct a major inspection of its blowout preventer components every three to five years.¹²⁰ Because there was

108. JOINT INVESTIGATIVE REPORT, *supra* note 1, at 157 (citing 43 U.S.C. § 1348(b)(1) (2006)).

109. *Id.*

110. *Id.* at 158.

111. DEEP WATER, *supra* note 1, at 68.

112. *Id.*

113. JOINT INVESTIGATIVE REPORT, *supra* note 1, at 162.

114. *Id.*

115. *Id.*

116. *Id.*

117. *Id.*

118. *Id.* at 162–63.

119. *Id.* at 163.

120. *Id.* (citing 30 C.F.R. § 250.446(a) (2012)).

no PINC reference on the inspectors' list for this provision, inspectors did not verify that those inspections of the blowout preventer components had been completed.¹²¹ Perhaps this inspection would have helped prevent disaster.

This example of an area where more comprehensive inspection could have been done, and might have been useful, is but one of many such circumstances. The Joint Investigative Panel's report includes many more. Suffice to say, inspectors did not seem to cover some of the areas, pieces, and parts that might have been helpful in preventing the disaster.

Finally, an additional issue related to agency operations in the Gulf, though not, as above, directly related to internal conflicts of interest, was the problem of chronic underfunding of the agency. Chronic underfunding is important for a number of reasons, not the least of which is the impact underfunding has on the ability of an agency to carry out its duties. MMS was responsible for promulgating the regulations that would render the whole operation safe. In particular, as discussed above, an MMS inspection should involve document review, on-site inspection of the facility, and equipment tests. Among other records-related reviews, MMS inspectors should review surveys, records regarding well control drills, and documentation of pressures in the blowout preventer. On-site inspections should include visual reviews of many different pieces of equipment-diverter systems, drilling fluid handling areas, and safety valves. Yet during the 1990s, when the MMS faced a dramatic increase in the offshore activity it was responsible for overseeing, the financial resources available "decreased precipitously."¹²² In 1996, just as major development in deepwater drilling activities was expanding, the MMS's budget reached its lowest point.¹²³

Although tasked with inspection and enforcement responsibility, MMS was not able to provide enough inspectors in the Gulf to conduct even the required rig and well construction inspections. The *Deepwater Horizon* was inspected on three occasions in the months immediately preceding the disaster, and the Joint Investigative Panel found that those inspections were not deficient.¹²⁴ But there were a lot of rigs and not so many inspectors in the Gulf. It was just not possible to keep up a comprehensive inspection program due to tightness of agency funding, expansion of the number of rigs that needed inspection, and the large numbers of items on the inspection

121. *Id.* at 163 ("Because no PINC existed for [30 C.F.R. § 250.446(a)], MMS inspectors did not regularly verify that the major inspection requirements had been met during drilling inspections.").

122. DEEP WATER, *supra* note 1, at 72.

123. *Id.* at 73 fig. 3.3.

124. JOINT INVESTIGATIVE REPORT, *supra* note 1, at 164.

agendas.¹²⁵ Furthermore, government and industry leaders pressured the MMS to lower or to eliminate enforcement mechanisms, stating that they were too burdensome and not conducive to safety.¹²⁶

With regard to permit issuance and enforcement, while the oil and gas industry works twenty-four hours a day, seven days a week, government workers, such as the MMS regulators, generally only worked traditional office hours, requiring “‘on-call’ responsibility” to be assigned to senior engineers.¹²⁷ But those engineers were at a major disadvantage because they were not permitted to access the permit database from off-site locations due to security concerns.¹²⁸ Furthermore, even during regular business hours, there was a severe lack of engineers to process the permit reviews. This shortage ultimately led to permit shopping, where applications were “shopped around” by contacting district offices outside the jurisdictional area in efforts to find an engineer who would approve it.¹²⁹

Further still, with regard to agency leadership and technical expertise, MMS personnel suffered from a severe loss of essential expertise throughout their ranks. According to a survey done by the Secretary of the Interior, “[a]lmost half of the [MMS] inspectors surveyed do not believe they have received sufficient training.”¹³⁰ The MMS had no oil and gas inspection certification program, nor did it have any exam required for inspector certification.¹³¹ Some inspectors even noted that they “rel[ie]d on industry representatives to explain the technology at a facility.”¹³²

125. *See* DEEP WATER, *supra* note 1, at 68 (discussing the details of inspections and noting that MMS’s “resources did not keep pace with industry expansion into deeper waters and industry’s related reliance on more demanding technologies”).

126. *See* Oil and Gas and Sulphur Operations in the Outer Continental Shelf—Incident Reporting Requirements, 71 Fed. Reg. 19,640, 19,640 (Apr. 17, 2006) (to be codified at 30 C.F.R. pt. 250) (discussing comments made by industry trade organizations and others involved in the industry regarding the proposed rule).

127. DEEP WATER, *supra* note 1, at 74.

128. OUTER CONTINENTAL SHELF SAFETY OVERSIGHT BD., U.S. DEP’T OF THE INTERIOR, REPORT TO SECRETARY OF THE INTERIOR KEN SALAZAR 6 (2010) (“[O]n-call engineers . . . are not allowed to access the permit database from off-site locations.”).

129. *See id.* (“[S]ome operators call various district offices to find an engineer who will eventually give approval.”).

130. *Id.* at 11.

131. *See id.*

132. *Id.*

In addition to lacking a sufficient number of inspectors,¹³³ the Safety Oversight Board strongly criticized MMS's handling of inspections. For example, management promoted single-inspector inspections in an effort to increase the total number of inspections, even though "most inspectors interviewed said that two-person teams would increase efficiencies, eliminate reliance on an operator representative for observations on safety tests, improve the thoroughness of the inspection, and reduce the ability of operators to successfully pressure an inspector not to issue [a citation]."¹³⁴ These interviews revealed an internal concern that the MMS was focused more on the quantity rather than the quality of inspections.

In addition, while engineers in the private sector were realizing steadily increasing salaries, salaries for government engineers were stuck in the midranges of the federal pay scale.¹³⁵ Thus, MMS had difficulty attracting the experience and expertise needed to oversee the increasingly complicated oil and gas drilling activities.¹³⁶ This lack of resources hampered the ability of the MMS to perform its vital functions, such as inspections and technological research.¹³⁷

2. Enforcement in Ohio

The Ohio legislature and the Ohio DNR have taken a firm hand in the promulgation and enforcement of statutes and regulations applicable to oil and gas development in Ohio. Ohio Revised Code section 1509.02 creates the Division of Oil and Gas Resources (DOGRM) Management within the ODNR, and gives the Division "sole and exclusive authority to regulate the permitting, location, and

133. See *Enforcement Measures*, BUREAU OF SAFETY AND ENVTL. ENFORCEMENT, <http://www.bsee.gov/About-BSEE/BSEE-Regions/Gulf-of-Mexico-Region/Enforcement-Measures.aspx> (last visited Apr. 5, 2013) (describing how the BSEE inspection program in the Gulf is directed by one regional office and five district offices and using fiscal year 2009 as an example to show that there were a small number of inspectors for a large number of inspections); *Deepwater Horizon Inspections: MMS Skipped Monthly Inspections on Doomed Rig*, HUFF POST GREEN (May 25, 2011, 5:30 PM), http://www.huffingtonpost.com/2010/05/16/deepwater-horizon-inspect_n_578079.html ("The job falls to the 55 inspectors in the Gulf who are supposed to visit the 90 drilling rigs once per month and the approximately 3,500 oil production platforms once per year.").

134. DEEP WATER, *supra* note 1, at 78 (citing OUTER CONTINENTAL SHELF SAFETY OVERSIGHT BD., *supra* note 128, at 9).

135. See DEEP WATER, *supra* note 1, at 79 (citing OUTER CONTINENTAL SHELF SAFETY OVERSIGHT BD., *supra* note 128, at 11–12).

136. *Id.*

137. See DEEP WATER, *supra* note 1, at 72–76 (discussing the impact of decreasing resources on various aspects of safety regulation).

spacing of oil and gas wells and production operations within the state.”¹³⁸ The legislature pointedly indicated its intent to preempt local regulation of oil and gas development by specifying that the Division’s regulations will constitute “uniform statewide regulation” and a “comprehensive plan with respect to all aspects of the locating, drilling, well stimulation, completing, and operating of oil and gas wells within this state.”¹³⁹ These provisions seem to target directly the Ohio Constitution’s home rule provision, article XVIII, section 3,¹⁴⁰ which allows localities the power of self-government, that is, to regulate themselves except when those regulations are in conflict with the state’s general laws. The legislature has stated that its regulation of oil and gas development is a general law. So, by this statute, the Ohio legislature seems to be claiming that local regulation of shale oil and gas operations, in any way, would conflict with the general laws.¹⁴¹ Whether that is true is an issue for another day.

Ohio legislation has strengthened the ODNR’s management of oil and gas drilling. Effective June 30, 2010, Senate Bill 165, as modified by its substitute bill, directed sweeping and comprehensive regulation

138. OHIO REV. CODE ANN. § 1509.02 (West 2012).

139. *Id.* The Ohio legislature has amended this section several times, each time altering the language to emphasize its intention to preempt local regulation of oil and gas drilling and operations. For example, in 2009 the language gave the agency “authority to regulate the permitting, location, and spacing of oil and gas wells within the state.” See 2004 Ohio Legis. Serv. Ann. L-987 (West). In 2012, the same section said “authority to regulate the permitting, location, and spacing of oil and gas wells *and production operations* within the state.” OHIO REV. CODE ANN. § 1509.02 (West Supp. 2012) (emphasis added). In 2009, it said, “comprehensive plan with respect to all aspects of the locating, drilling, and operating of oil and gas wells within this state, including site restoration and disposal of wastes from those wells.” 2004 Ohio Legis. Serv. Ann. L-987 (West). And in 2012, the language was changed to say “comprehensive plan with respect to all aspects of the locating, drilling, *well stimulation, completing,* and operating of oil and gas wells within this state, including *site construction* and restoration, *permitting related to those activities,* and the disposal of wastes from those wells.” OHIO REV. CODE ANN. § 1509.02 (emphasis added). These changes are evidence of the legislature’s consistent efforts to limit control of oil and gas production and operations to the ODNR.

140. See OHIO CONST. art. XVIII, § 3 (“Municipalities shall have authority to exercise all powers of local self-government and to adopt and enforce within their limits such local police, sanitary and other similar regulations, as are not in conflict with general laws.”).

141. See *Vill. of Struthers v. Sokol*, 140 N.E. 519, 519–20 (Ohio 1923) (“In determining whether an ordinance is in ‘conflict’ with general laws, the test is whether the ordinance permits or licenses that which the statute forbids and prohibits, and vice versa.”). Still, the Ohio legislature was clearly attempting to claim preemption of local regulation. Whether that was successful is a topic for another paper.

of oil and gas exploration and drilling.¹⁴² It directed the agency to oversee rules on well construction and amended language that affected the size, shape, and make-up of parcels that could be leased for drilling, and it included requirements for spill control and containment plans.¹⁴³

Following the legislature's enactment of Senate Bill 315, the ODNR promulgated rules on best management practices. Senate Bill 315 directed the ODNR to fill in, or refine, areas of regulation not addressed, or not addressed sufficiently, through Senate Bill 165. For example, Senate Bill 315 included new rules on well pad design, certification, and construction; design standards for centralized fresh water impoundments; and the development of best management practices for pre-drill sampling.¹⁴⁴ This sampling enables drillers, and thereby landowners, to understand the baseline status of the ground water wells in the area where drilling will occur. Results of the pre-drill sampling must be posted "prior to" drilling, but need not be included in initial applications to drill.¹⁴⁵ They must be conducted to a 300-foot radius in designated urban areas, and a 1,500-foot radius in nonurban areas, unless ODNR modifies the requirements, which it can. ODNR has "best management practices for pre-drilling water sampling" and is developing standards for certified samplers and laboratories.¹⁴⁶ In another example, Senate Bill 315 directed ODNR to

142. See JAMES ZEHRINGER, DIRECTOR, OHIO DEP'T OF NATURAL RES., HOUSE PUBLIC UTILITIES COMMITTEE PROPONENT TESTIMONY IN SUPPORT OF SUBSTITUTE SENATE BILL 315, at 5 (2012), available at <https://www.dnr.state.oh.us/Portals/11/oil/pdf/UpdatedSB315HouseProponentTestimonyofDirectorZehringer.pdf> ("SB 165 of the 128th General Assembly was a bipartisan bill that thoroughly overhauled Ohio's oil and gas regulations and created a firm foundation for proper oversight of the oil and gas industry in Ohio. However, there are certain aspects of the horizontal drilling process that were not fully or adequately addressed. Sub. SB 315 addresses those remaining regulatory issues.").

143. See S.B. 165, 128th Gen. Assemb., Reg. Sess. (Ohio 2010), available at http://www.legislature.state.oh.us/BillText128/128_SB_165_EN_N.pdf (unofficial version of the bill amending various sections of the Ohio Revised Code).

144. S.B. 315, 129th Gen. Assemb., Reg. Sess. (Ohio 2012).

145. *Id.*

146. See DIV. OF OIL & GAS, OHIO DEP'T OF NATURAL RES., BEST MANAGEMENT PRACTICES FOR PRE-DRILLING WATER SAMPLING (2012). The Ohio EPA currently has a lab certification program. See *Certified Laboratories*, OHIO EPA, <http://epa.ohio.gov/ddagw/labcert.aspx> (last visited Apr. 5, 2013) (click on "How to obtain a Laboratory Certification") ("A certificate of approval to perform drinking water analyses is issued by the Ohio EPA, Division of Drinking and Ground Waters (DDAGW) to a laboratory achieving a satisfactory evaluation based on an on-site survey. . . . To be eligible to obtain an on-site survey,

revise its regulations to account for the drilling technologies currently being used in Ohio, including horizontal drilling and hydraulic fracturing. For example, it newly defines “horizontal well” as an oil and gas well “in which the wellbore reaches a horizontal or near horizontal position . . . and the well is stimulated.”¹⁴⁷

In Ohio, “[i]nspectors investigate citizens’ complaints, enforce and oversee well construction and waste disposal activities, and the plugging of wells and site restoration.”¹⁴⁸ They “are available to act on emergencies, such as well or tank fires that are a threat to public health or safety.”¹⁴⁹ With regard to oil spills, in particular, “[d]ivision inspectors respond to reported oil spills and coordinate remediation of contaminated streams or ponds with the Ohio EPA and the ODNR Division of Wildlife” and “division inspectors often assist firefighters by advising them about potential hazards and serving as a liaison between the firefighters and the well owner.”¹⁵⁰ Ohio also inspects well drilling operations. In particular, Division inspectors “witness critical phases of well drilling operations to ensure [the safety of citizens] and the protection of soil and water resources.”¹⁵¹

In 2010, ODNR’s Division of Mineral Resource Management (DMRM) had twenty-one oil and gas inspectors assigned to five of its

a laboratory must have received an approval letter from the Ohio EPA, Division of Environmental Services (DES), Laboratory Certification Section, for the current laboratory floor plans, have participated acceptably in any required Proficiency Test, and have submitted an application for an on-site survey. If the submitted survey application is acceptable, an on-site survey will be performed according to the date scheduled by the Laboratory Certification Office.”) *See generally* OHIO REV. CODE ANN. ch. 3745 (West 2012) (pertaining to laboratory certification standards, which include rules for Ohio public drinking water systems adopted under Ohio Revised Code Chapter 6109, and rules for underground injection well control adopted under section 6111.044).

147. S.B. 315.

148. Div. of Oil and Gas Res., Ohio Dep’t of Natural Res., *Regulatory Enforcement*, OHIO.GOV, <http://oilandgas.ohiodnr.gov/complaint> (last visited Apr. 5, 2013).

149. *Id.*; *see also* STATE REVIEW OF OIL AND NATURAL GAS ENVTL. REGULATIONS, INC., OHIO HYDRAULIC FRACTURING STATE REVIEW 28 (2011), [hereinafter STRONGER] (“Specific positions, including inspectors and geologists, were identified as necessary to address complaints, including those associated with hydraulic fracturing.”).

150. DIV. OF MINERAL RES. MGMT., OHIO DEP’T OF NATURAL RES., OHIO OIL AND GAS FIELD ENFORCEMENT, *available at* <http://oilandgas.ohiodnr.gov/portals/oilgas/pdf/oilgasfieldenforcement.pdf> (last visited Mar. 6, 2013).

151. *Id.* Also, “[b]efore a well plugging operation starts, division inspectors must approve plugging materials, methods and a plugging plan for each well” in non-coal-bearing areas “based upon records of site-specific geology and well construction.” *Id.*

seven field offices. The agency has an inspector priority matrix to assist it in risk assessment and to help define inspectors' work priorities. The agency has prioritized well construction and hydraulic fracturing operations as critical areas on which inspectors must focus. Inspectors were responsible for issuing 1,533 permits in 2010, including 690 drilling permits, according to the 2011 ODNR Ohio Oil and Gas Summary.¹⁵² Furthermore, these inspectors were responsible for overseeing the plugging of 355 wells, and the drilling of 460 oil and gas wells in forty-two of Ohio's eighty-eight counties.¹⁵³ In total, the ODNR's inspectors processed over 49,435 production reports for 2010.¹⁵⁴

Ohio's Senate Bill 165 provided statutorily for fee increases to support new positions within the agency, presumably for additional inspectors, and created multiple new funding mechanisms to support the agency's activities.¹⁵⁵ Before the implementation of Senate Bill 165, there were approximately thirty-five full-time equivalent positions in the oil and gas program.¹⁵⁶ Plan implementation and additional funding could double this number.¹⁵⁷ Well constructors must notify ODNR within twenty-four hours or at "another time period agreed to by the chief's authorized representative" prior to well pad construction, and ODNR must conduct a site review prior to issuing a permit and prior to well pad construction.¹⁵⁸ ODNR sends out a weekly notice to the county engineer of each county that contains an active well or has proposed drilling activities.¹⁵⁹ The agency also provides notice to municipal authorities in those areas.¹⁶⁰

Ohio seems to suffer from enforcement problems similar to those that befell MMS in the Gulf. A single agency controls permitting, inspection, and enforcement, which is not at all unusual in an

152. See MCCORMAC REPORT, *supra* note 68, at i (discussing the findings on the number of permits issued).

153. *Id.* at 1, 2, 10.

154. *Id.* at 1.

155. See S.B. 165, 128th Gen. Assemb., Reg. Sess. (Ohio 2010) (amending OHIO REV. CODE ANN. § 1509.02 to have all money collected be used "for expenses that are critical and necessary for the protection of human health and safety and the environment related to oil and gas production in this state").

156. See STRONGER, *supra* note 151, at 6 (indicating that one of the strengths of Senate Bill 165 is its ability to create funding mechanisms to increase full time oil and gas program employees).

157. *Id.*

158. OHIO REV. CODE ANN. § 1509.06(J) (West 2012).

159. *Id.* § 1509.06(B).

160. *Id.*

administrative state, but, like MMS, the Ohio agency is underfunded and therefore suffers from an insufficient number of inspectors. This was a problem in the Gulf, and ODNR and the Ohio legislature should continue to work to ensure that Ohio is able to carry out sufficient high-quality inspections to identify looming problems and make corrections before disaster strikes.

One additional issue regarding the Ohio enforcement process for shale oil and gas development is that, under the Ohio rules, the Department's orders to issue, deny or modify a permit to drill a horizontal well are not subject to Ohio's Administrative Procedure Act (APA).¹⁶¹ This means that they are not subject to public comment or to the timeframe requirements required by the Ohio APA. This is troubling, and it sets Ohio's process apart from the federal system (and systems in other states), which generally allow for more public participation. Assuming that agencies do learn and improve through the public participation process, this omission limits the ability of the Ohio agency to learn about potential issues and areas of concern with respect to its permitted drilling operations.

D. Conclusion Regarding Conflicts of Interest

Whereas at the time of the Gulf disaster the MMS controlled several activities that presented internal conflicts of interest, Ohio's regulation of oil and gas production does not present this problem, at least not to the same extent. Unlike the situation with MMS, Ohio does not have a single agency controlling the conflicting functions of leasing, enforcement, and revenue collection.

Whereas MMS controlled leasing of drilling rights in the Gulf, ODNR has no control over leasing. Instead, Ohio leases are private transactions. No state agency in Ohio is handing out leases. And although MMS collected revenue in various forms, ODNR does not serve that function. The Ohio system is not without fault, but its faults do not vest in the agency an authority that would conflict directly with its other responsibilities. Still, ODNR's system presents

161. See KATHLEEN LUIKART ET AL., OHIO LEGISLATIVE SERV. COMM'N, BILL ANALYSIS, SUB. S.B. 315, at 12 (discussing the nonapplicability of the Administrative Procedure Act); see also CRAIG KASPER & MARK BONIFAS, NAVIGATING OHIO'S SHALE OIL & GAS LEGISLATION: UTICA SHALE ISSUES IN LAW, PRACTICE AND POLICY (2012). In addition, the Ohio Supreme Court recently held that the Ohio Oil and Gas Commission lacks jurisdiction to hear appeals of drilling permits issued by the ODNR Division of Oil and Gas. *Chesapeake Exploration, L.L.C. v. Oil & Gas Comm'n*, 985 N.E.2d 480 (Ohio 2013). Even though the Commission has jurisdiction to hear appeals from orders of the chief of the Division of Oil and Gas, drilling permits are not considered appealable "orders." *Id.* at 483; see OHIO REV. CODE ANN. § 1509.06 (West Supp. 2012) (divesting the Commission of jurisdiction over permitting decisions).

some problems regarding revenue collection. In particular, the gas well fund, which is statutorily authorized and tied to the severance tax rates, helps fund the agency and Ohio's coffers. This is concerning and is worthy of further study. Rather than the agency dismantling seen at the federal level, the DMRM has realigned staff into single program areas, which makes sense substantively, provided the reorganization does not create internal conflicts of interest. In particular,

[t]he Oil and Gas Program developed a very detailed realignment plan, which included a thorough analysis of funding, staffing levels, and priority workloads. The realignment plan was used as a guideline for the development of SB 165. Specific positions, including inspectors and geologists, were identified as necessary to address complaints, including those associated with hydraulic fracturing. Well construction and hydraulic fracturing operations were re-prioritized as critical job coverage. SB 165 included increases in certain fee schedules and created a number of new funding mechanisms to support division activities. The division staffing levels will almost double and hiring of staff has been initiated.¹⁶²

Thus, the oil and gas program developed its realignment plan, with stakeholder input that included an analysis of funding, staffing levels and priority workloads.

More recently, in October 2011, the oil and gas program formerly under the ODNR DMRM became a standalone division known as the Division of Oil and Gas Resources Management.¹⁶³ This has effectively separated oil and gas regulation from the regulation of the state's other natural resources. If Ohio can keep an eye on the funding mechanisms, and keep the inspection function independent of revenue collection, Ohio's system will not present the debilitating conflict of interest that MMS faced in the Gulf.

II. RESEARCH AND FOLLOW-THROUGH

The next lesson from the Gulf that could be useful in Ohio is that of follow-through in research or investigation, especially when there is an indication of a potentially dangerous problem. According to the many investigations and reports following the Gulf coast disaster, failure to follow through on indicated safety issues was a persistent and ultimately devastating problem. This Part will provide some examples of insufficient follow-through on research from the Gulf experience, and will suggest that Ohio agencies demand better accountability from the drilling industry with respect to following

162. STRONGER, *supra* note 151, at 28.

163. Am. Sub. H.B. 153, 129th Gen. Assemb., Reg. Sess. (Ohio 2011).

through in determining the causes of accidents and preventing them from occurring in the future.

A. *Some Examples of Insufficient Research or Follow-Through in the Gulf*

In addition to facilitating the insufficient numbers and quality of inspections in the Gulf, underfunding of MMS meant that there were insufficient resources to do the research needed for responsible rulemaking.¹⁶⁴ Fundamentally, there have been numerous and rapid changes in the technologies associated with oil and gas development and production in ultra-deep water as well as shale.¹⁶⁵ With respect to offshore drilling advances, there have been improvements in offshore drilling rigs, including the advent and incorporation of dynamic positioning devices and more sophisticated navigation systems, enabling drilling in waters thousands of feet deep.¹⁶⁶ Many of these advances have reduced adverse impacts for the environment. For example, according to a Department of Energy Report, technological advances in the oil and gas industry have led to the use of 22,000 fewer wells than were necessary in 1985 to develop the same annual amount of oil and gas reserves,¹⁶⁷ a decrease in drilling waste by as much as 148 million barrels due to increased well productivity,¹⁶⁸ and a decrease in the drilling footprint of well pads in relation to production due to advances in drilling technology, such as modular drilling rigs and slimhole drilling.¹⁶⁹ Also, the size and weight of drilling rigs have decreased, thus reducing their surface impact,¹⁷⁰

164. See DEEP WATER, *supra* note 1, at 72–73 (because of inadequate funding, MMS could not keep regulations up to date with modern technologies).

165. See David Blackmon, *Horizontal Drilling: A Technological Marvel Ignored*, FORBES (Jan. 28, 2013, 3:31 PM), <http://www.forbes.com/sites/davidblackmon/2013/01/28/horizontal-drilling-a-technological-marvel-ignored> (discussing the recent innovation in horizontal drilling and how it has enabled operators to maximize returns); see also Lynn Helms, *Horizontal Drilling*, N.D. DEP'T OF MINERAL RES. NEWSL., Jan. 2008, available at <https://www.dmr.nd.gov/ndgs/newsletter/NL0308/pdfs/Parshall.pdf> (discussing three generations of horizontal drilling, including how the current generation has led to a dramatic boost in production rates).

166. See *Offshore Drilling*, NATURALGAS.ORG, http://www.naturalgas.org/naturalgas/extraction_offshore.asp (last visited Apr. 6, 2013) (providing an overview of offshore drilling).

167. OFFICE OF FOSSIL ENERGY, U.S. DEP'T OF ENERGY, ENVIRONMENTAL BENEFITS OF ADVANCED OIL AND GAS EXPLORATION AND PRODUCTION TECHNOLOGY 36 (1999).

168. *Id.*

169. *Id.* at 36, 38–39, 41.

170. *Id.* at 39.

while new exploration techniques have helped double the success rate of targeting productive wells, thereby reducing the amount dry holes.¹⁷¹ With respect to advances in shale oil and gas production technology in particular, in recent years increases in available horsepower have enabled drillers to accommodate horizontal wells rather than merely the vertical wells of the past.¹⁷² In addition, advances in the composition of fracturing fluids have led to better, longer lasting fractures in the target formation.¹⁷³ Recovery of oil and gas via vertical drilling is strictly limited to the depth of the pipe itself; for example, when drilling into a shale formation 100 feet thick, vertical drilling allows one to reach only 100 feet of rock, and limits recovery to that amount.¹⁷⁴ With the arrival of horizontal drilling, it is now possible for well operators to set a pipe horizontally through a mile or more of the same formation, thereby accessing 5,200 feet of rock rather than the 100 feet accessible using vertical drilling.¹⁷⁵ Drillers can now also drill extremely precisely, hitting specific targets far underground. It just makes sense that these advances would lead to vastly greater productivity.

So, changes have occurred in the areas of technology, practice, and risk management. In the Gulf, this is due largely to the expansion of oil and gas exploration into ever-deeper waters, and the necessary and resulting advances in technology that make that drilling possible and largely successful. On land, the combination of hydraulic fracturing and horizontal drilling has also moved quickly, leaving regulators scrambling to keep up with advances in the way technology is used. In the Gulf, neither government nor industry had kept up sufficiently with these changes in terms of their ability to manage and oversee the safety of resulting operations.¹⁷⁶ For example, rather than upgrading the requirements for modern blowout-preventer stacks, which had developed into the critical last line of defense for deepwater wells, the MMS actually began loosening its formerly frequent testing requirements, based upon assumptions that this new technology would be more reliable than the old technology.¹⁷⁷ Furthermore, the agency took this action even though a series of studies conducted by the MMS and third parties raised the possibility of high failure rates

171. *Id.* at 29.

172. Blackmon, *supra* note 165.

173. *Id.*

174. *Id.*

175. *Id.*

176. DEEP WATER, *supra* note 1, at 251.

177. The MMS said the revised testing requirements could save industry \$35–46 million per year without compromising safety. *See MMS Eases Rule for BOP Testing*, OIL & GAS J., June 8, 1998, at 32.

for blowout systems and blind-shear rams under certain deepwater conditions.¹⁷⁸

This lack of funding and resources extended beyond the MMS and also affected the Coast Guard, which is responsible for regulating the “safety of life and property on Outer Continental Shelf (OCS) facilities, vessels, and other units engaged in OCS activities.”¹⁷⁹ That said, the September 11, 2001, terrorist attacks led to pressure on the Coast Guard to focus on border and port security, and as a result, the Coast Guard transferred much of its responsibility for fixed platform safety to the MMS in 2002.¹⁸⁰ This further strained the already taxed MMS.

As will be explained in the following sections, three examples of areas where MMS or the companies involved failed to follow through on research or investigation include kick detection, drilling techniques, and cleanup technologies. To be sure, advances in these areas were, and are, constant. The companies involved often are at the forefront of those advances, and their employees may be among the most knowledgeable on each of these subjects. Still, there is evidence that they moved too quickly towards oil production at the Macondo well, without following through on research or investigations that might well have been protective of people’s lives and the environment. There were well-documented instances where trouble was indicated and employees did not fully investigate and resolve the indicated problems, thus leaving the door open for disaster that might have been averted, and the responsible agency was not diligent about requiring follow-through on research or investigation.

1. Kick detection

Although I explicitly excised issues of engineering from this Article, one engineering-related issue is simply too important to ignore. At the time the Macondo blowout occurred, the crew was already aware that the well had experienced a “kick” in well pressure in the past. Specifically, on March 8, 2010, just a month before the disaster, the crew experienced a kick and what is almost euphemistically called a “well control event,” which they failed to

178. See DEEP WATER, *supra* note 1, at 71–74 (discussing MMS and third party technical tests conducted on new technologies).

179. Outer Continental Shelf Activities, 33 C.F.R. § 140.1 (2012).

180. Inspection Under, and Enforcement of, Coast Guard Regulations for Fixed Facilities on the Outer Continental Shelf by the Minerals Management Service, 67 Fed. Reg. 5912 (Feb. 7, 2002) (to be codified at 33 C.F.R. pt. 140); see also DEEP WATER, *supra* note 1, at 75–76 (explaining how the Coast Guard had failed to update safety rules and instead passed authority to MMS, thus stretching MMS’s inadequate resources even thinner).

detect during the thirty-minute period following it.¹⁸¹ Most of the crew members who were present for the March event were also on duty during the ultimate blowout.¹⁸² Rig management personnel have openly admitted that those individuals “screwed up by not catching the kick.”¹⁸³ Most distressing, however, is that upon experiencing the “kick” or “well control event” in March, crew and management were not diligent in determining its causes with an eye toward preventing repetition of the problems. In fact, BP failed even to perform an incident investigation following the March event.¹⁸⁴ A full investigation into the cause of the March event might well have prevented the April disaster. BP also did not inform people involved in the work at the rig of issues concerning the cementing job—knowledge which also might have helped avoid the ensuing pressure problems.¹⁸⁵

Other failures to investigate or research test anomalies were documented as well.¹⁸⁶ In particular, an engineer, Mark Hafle, failed to follow up with investigation of pressure test anomalies identified by another engineer, Donald Vidrine.¹⁸⁷ The Joint Investigative Panel concluded that failure to address situations such as anomalous pressure test results and oddities in displacement operations

181. JOINT INVESTIGATIVE REPORT, *supra* note 1, at 110. BP crewmembers “missed potential indications of problems during the March 8 event that they should have caught.” *Id.* But for additional information regarding the circumstances surrounding the earlier kick and BP’s reaction to it, see DEEP WATER, *supra* note 1, at 109–22, which describes the timeline of kick detection events and gives a rundown of the kick detection process and who is responsible for the various monitoring functions.

182. JOINT INVESTIGATIVE REPORT, *supra* note 1, at 77 (noting that all except for one person, a mudlogger, were present for both events).

183. *Id.* at 76 (internal quotation marks omitted).

184. JOINT INVESTIGATIVE REPORT, *supra* note 1, at 195.

185. *Id.* at 69–70.

186. *See id.* at 196 (listing failures to conduct tests and other potential contributing causes); *see also* NAT’L COMM. ON THE BP DEEPWATER HORIZON OIL SPILL & OFFSHORE DRILLING, MACONDO: THE GULF OIL DISASTER, CHIEF COUNSEL’S REPORT 228 (2011) [hereinafter CHIEF COUNSEL’S REPORT] (“Despite knowing all of these cementing-related risks, BP’s onshore team did not emphasize them to the individuals conducting the negative pressure test (including its own well site leaders). It also did not emphasize these risks to the individuals who were monitoring the well for kicks during riser displacement (Transocean and Sperry Drilling personnel), much less involve those individuals in discussions about how to mitigate the risks of cement failure.” (citing Testimony of Brett Coteles (BP), Hearing Before the Deepwater Horizon Joint Investigation Team (Aug. 27, 2010) (transcript at 113))).

187. JOINT INVESTIGATIVE REPORT, *supra* note 1, at 196.

contributed to well control failure.¹⁸⁸ This failure to pursue obviously indicated investigations may also have contributed to the disaster. In fact, criminal charges against Vidrine and another top-ranking rig supervisor, Robert M. Kaluza, followed as a result of this failure to pursue “glaring red flags indicating that the well was not secure.”¹⁸⁹ Clearly, follow-through and completion of indicated investigations and research was a problem in the Gulf.

Some of these issues lie in failure to detect a problem in the first (and the later) instance, and others lie in management and training problems—in particular, failure to communicate known risks, which should have been apparent going forward following the March kick.¹⁹⁰ Kicks are not common at the temporary abandonment stage of the drilling process—when the drilling rig is removed, later to be replaced with a production rig.¹⁹¹ The fact that a kick occurred at that stage should have raised some red flags. Apparently, several anomalies had occurred in the process that might have raised an alarm, but the crew

188. *Id.* Incidentally, Vidrine and another top-ranking BP supervisor on the rig, Robert M. Kaluza, were indicted on twenty-three counts of criminal charges, including involuntary and seaman’s manslaughter, for allegedly ignoring warning signs that a blowout would occur and thus causing the explosion that sank the rig. *See* Steven Mufson, *In Spill Deal, BP to Plead Guilty to Manslaughter*, WASH. POST, Nov. 16, 2012, at A1 (reporting the \$4 billion payment being made by BP as the largest criminal settlement in U.S. history).

189. Mufson, *supra* note 188.

190. Transocean and BP did not have adequate procedures to address the risk or impact of decisions. *See* CHIEF COUNSEL’S REPORT, *supra* note 186, at 244 (“I thought about this a lot yesterday and asked for input from the rig and none of us could come up with anything we are not already doing You can tell them what the hazards are, but until they get used to identifying them their selves, they are only following your lead”); *see also id.* at 181 (“By this point, rig personnel had observed several serious anomalies. Each was a sign that fluids are moving in the well. Those anomalies should have caused alarm. But there appears to have been no hint of alarm. The crew actively investigated the anomalies and performed diagnostic interventions. But it appears that the crew did not perform the most basic kick detection intervention—a flow check. If they had done so, they would have directly seen flow coming out of the well and should have shut in the well. The fact that the crew apparently did not perform a flow check suggests that [the drill crew] either did not consider or had already ruled out the possibility of a kick.” (internal quotation marks omitted)).

191. *Id.* at 185 (“In a 2001 study of 48 deepwater kicks in the Gulf of Mexico, the vast majority of kicks occurred during drilling operations. By contrast, only one kick occurred in association with a well abandon[ment] operation.” (internal citations and quotation marks omitted)).

did not perform an indicated “flow check,” which would have alerted them to the fact that flow was coming out of the well.¹⁹²

Another related issue is that the crew had become, in the words of BP’s well team leader, “too comfortable.”¹⁹³ They were so comfortable with explicable deviations from the norm that they effectively ceased questioning and reporting discrepancies and other issues of potential concern to the BP personnel onshore.¹⁹⁴ In particular, BP personnel on the rig, when confronted with a negative pressure test that did not meet the applicable standards, chose to conduct an alternative test and explain away the problem.¹⁹⁵ They did not pursue the problem and resolve it.¹⁹⁶ This is a failure not only in training and communication, but fundamentally, it is a failure in research and follow-through. Research into the actual causes of the March kick might well have been pivotal in preventing the April disaster. That said, while drilling operators have acknowledged that kick detection was critical, they’ve also suggested that no technology was available to determine reliably the ultimate cause of a kick.

2. Drilling Techniques

Although drilling in deep water was not new at the time of the Gulf disaster, the 18,000 foot Macondo well was deeper than many of the wells that came before it,¹⁹⁷ and several of the technologies used in drilling were relatively untested in very deep water and in the harsh conditions associated with it, including extremely high pressure.¹⁹⁸ For example, the operation crew apparently never took the extreme pressure into account when evaluating the operation of the blowout preventer.¹⁹⁹ This oversight led to the utilization of a material that

192. *Id.* at 181.

193. JOINT INVESTIGATIVE REPORT, *supra* note 1, at 110.

194. *Id.*

195. See CHIEF COUNSEL’S REPORT, *supra* note 186, at 183–84 (describing how the alternative kick detection was mediocre and dependent on human factors). “[S]ome of the sensors were not particularly accurate. For example, electronic sensors for pit volumes can be unreliable, so much so that the crew would sometimes revert to using a string with a nut to measure pit volume change. . . . [T]he sensors often lacked precision and responded to movement unrelated to the state of the well. . . . These shortcomings can result in rig personnel not receiving quality data and, furthermore, discounting the value of the data they do receive.” *Id.* at 184.

196. JOINT INVESTIGATIVE REPORT, *supra* note 1, at 111 (explaining that despite decades of combined experience, supervisory personnel on the rig failed to communicate operational anomalies).

197. DEEP WATER, *supra* note 1, at 96.

198. *Id.* at 51.

199. NATIONAL ACADEMY REPORT, *supra* note 7, at 71.

buckled under the high pressure and pushed the drill pipe up against the wellbore and away from the cutting reach of the blind shear rams.²⁰⁰

There were several distinct challenges that arose from the move to ultra-deep water. For example, risers connecting a drilling vessel to the blowout preventer on the seafloor had to be lengthened substantially.²⁰¹ This greater length caused them to be “exposed to strong ocean currents encountered in the central Gulf.”²⁰² Also, “higher volumes of mud and drilling fluid were required in these long risers,” which made “drillers’ jobs more demanding.”²⁰³ Predictably, “[c]onnecting and maintaining blowout preventers thousands of feet beneath the surface can only be performed by remote-operating vehicles,” and the difficulty of this endeavor is only exacerbated by extremely “low temperatures and high pressures at the ocean bottom.”²⁰⁴ At that depth, well shut-in pressures can surpass 10,000 pounds per square inch, bottom-hole temperatures can exceed 350 degrees Fahrenheit, and salt and tar-zone formations can cause additional trouble.²⁰⁵ Further, methane hydrate, pockets of “[m]ethane gas locked in ice (‘fire ice’) forms at low temperature and high pressure,” and when disturbed “can activate the release of 160 cubic feet of gas from one cubic foot of methane, . . . destabilizing the drilling foundation.”²⁰⁶

Despite these many difficulties, the drilling industry adapted quickly. They developed the spar platform, which allowed for greater stability in the drilling platforms.²⁰⁷ The design was essentially “a giant buoy consisting of a large-diameter, vertical cylinder supporting a deck for drilling and processing.”²⁰⁸ There were also advances in computer technology and remote-operating vehicles that allowed for maintenance and operation of the deep-water blowout preventers.²⁰⁹

200. *Id.* at 69–70.

201. *See* DEEP WATER, *supra* note 1, at 51 (describing the challenges of ultra-deep-water drilling and production).

202. *Id.*

203. *Id.*

204. *Id.*

205. *Id.*

206. *Id.* at 52.

207. *Id.* at 48–49 (describing how geological conditions led to rapid innovation resulting in a transition away from semisubmersible wells to wells housed on a floating platform).

208. *Id.* at 48.

209. *Id.* at 51–52.

Welding techniques improved.²¹⁰ The oil and gas industry was able to build the first floating production, offloading, and storage facility to facilitate production from the deep reservoirs of the Lower Tertiary geologic formation.²¹¹ This affected deep-water drilling directly, as it allowed for drilling further out from shore into much deeper waters.²¹²

Despite these technological advances, under these conditions the margin for error was small. The Joint Investigative Panel “concluded that the failure of the [blowout preventer] to shear the drill pipe and seal the wellbore was caused by the physical location of the drill pipe.”²¹³ There were also numerous failures surrounding cementing methodologies and testing. So, the advances were many and significant, but the risks of human error remained enormous.

B. Some Areas for Additional Research or Follow-Through in Ohio

In Ohio, of course, there are also areas where follow-through could be improved and where additional research could prove protective of life, property, and the environment. For example, Ohio would benefit from research on the effects of a shale oil and gas wellhead blowout in this specific ecosystem. Drilling organizations often claim that as properly designed and executed, drilling for oil and gas in shale rock is sufficiently protective of the environment, in particular of the ground water through which the wells pass.²¹⁴ It is true that there have been few instances of accidents causing groundwater contamination. But it has happened. As recently noted in *National Geographic*, “Catastrophic well-casing failures can happen at any time. The EPA is now investigating a 2011 blowout during fracking in a well near Killdeer[, North Dakota,] that pierced the aquifer the town relies

210. *Id.* at 50.

211. *Id.* at 51.

212. *Id.*

213. JOINT INVESTIGATIVE REPORT, *supra* note 1, at 198.

214. *See Hydraulic Fracturing: Safe Oil and Natural Gas Extraction—Video*, AM. PETROL. INST., <http://www.api.org/oil-and-natural-gas-overview/exploration-and-production/hydraulic-fracturing/hydraulic-fracturing-safe-oil-natural-gas-extraction.aspx> (last visited Apr. 6, 2013) (providing an overview of the fracturing process); *Frequently Asked Questions*, OHIO DEP’T OF NATURAL RES., <http://oilandgas.ohiodnr.gov/Citizens/Oil-Gas-FAQ.aspx> (last visited Apr. 6, 2013) (providing answers to questions regarding the production of gas through fracking); *see also Environment and Safety*, OHIO OIL AND GAS ASS’N, <http://ooga.org/our-industry/environment-safety> (last visited Apr. 6, 2013) (providing an overview of well construction in Ohio and government regulations designed to keep the environment, and water in particular, safe). “Whenever you penetrate the earth’s surface and create a well bore, there is some risk to the process. However, proper regulations and oversight by the Division of Oil and Gas Resources Management (DOGRM) helps to mitigate these risks.” *Id.*

on.”²¹⁵ It is a known possibility that human error can cause well failure and a resulting blowout. Blowouts, as we know, can cause explosions, death, injuries, and harm to ecosystems. Because this event is a known possibility, not only as predicted in the Gulf, but also as proven in the hydraulic fracturing of shale in North Dakota, Ohio should heed the warnings these events provide. Ohio should follow through by conducting or commissioning research on the causes and prevention of shale well blowouts, and regulate accordingly.

Additional research needs in Ohio include a stepped-up focus on cleanup protocols suited to Ohio’s ecosystems. It is well documented that the Gulf benefited from the natural presence of oil-eating microbes.²¹⁶ Ohio’s ecosystem does include similar microbes far beneath the Earth’s surface, but they are of a different variety than those found in the Gulf.²¹⁷ Although we are learning, we know very little about the ability of Ohio’s ecosystems to respond to large spills of oil or gas. Unlike the cleanup operations in the Gulf, which benefited from ocean current dispersion of the released oil,²¹⁸ because Ohio’s shale operations are land based, both below ground and on the surface, they cannot benefit from ocean current dispersion of spills.

215. Dobb, *supra* note 5, at 56.

216. See Mengran Du & John D. Kessler, *Assessment of the Spatial and Temporal Variability of Bulk Hydrocarbon Respiration Following the Deepwater Horizon Oil Spill*, 46 J. ENVTL. SCI. & TECH. 10,499 (2012) (discussing a bloom of bacterial biomass in the Gulf of Mexico for a period of several months following the oil spill); see also Harlan Kirgan, *Oil-Eating Bacteria Feasted on Oil from Deepwater Horizon’s Broken Well Says Scientist*, GULFLIVE.COM (July 28, 2011, 6:45 AM), http://blog.gulflive.com/mississippi-press-news/2011/07/oil-eating_bacteria_feasted_on.html (discussing how large quantities of oil-eating bacteria devoured the oil spilled by Deepwater Horizon).

217. See Spencer Hunt, *Creatures Thrive in ‘Fracking’ Wells*, COLUMBUS DISPATCH (Jan. 6, 2013, 8:40 AM), <http://www.dispatch.com/content/stories/science/2013/01/06/creatures-thrive-in-fracking-wells.html> (mentioning a study to determine whether microbes are native to local shales or were introduced by drillers).

218. See David Biello, *How Going with the Flow Helped Microbes Eat BP’s Oil Spill*, SCI. AM. (Jan. 9, 2012), <http://blogs.scientificamerican.com/observations/2012/01/09/how-going-with-the-flow-helped-microbes-eat-bps-oil-spill> (“Water mixing ensured that the 200 billion grams of hydrocarbons injected into the Gulf of Mexico became, ultimately, some 100 sextillion microbial cells of propane- and ethane-consuming *Colwellia*, aromatic-eating *Cycloclasticus*, methane-munching *Methylococcaceae*, alkane-eating *Oceanospirillales*. They also ensured that hydrocarbons were introduced into waters already hosting microbe blooms spurred by earlier oil and gas releases. The team of researchers suggest that this ‘autoinoculation’—early blooms drifting back to the spill site and chowing down anew—allowed the microbes to work fast over the course of the months-long disaster as well as keeping oxygen depletion from growing too severe in any one place.”).

It is well known that human error, particularly with respect to the cement job, was an important factor in the circumstances surrounding the Gulf spill.²¹⁹ Consequently, additional research in Ohio on technology that would allow for better understanding and assessment of the cement jobs would be valuable because the integrity of the wells generally hinges on the quality of the cementing job. Errors in cementing can cause an accident at the wellhead, or an accident “down hole.”²²⁰ It would be good to have a clearer understanding of the realistic worst-case scenario of a wellhead or down-hole accident in Ohio and to understand whether Ohio is prepared to handle an accident that meets or exceeds a predicted worst-case scenario. That is, in the vicinity of each well, does Ohio have an appropriate number of specifically trained emergency responders, appropriate vehicles, and approved and proven dispersants?

In terms of follow-through, Ohio has room for improvement as well. For example, in May 2012, the ODNR stated a goal of tripling the number of inspectors by the end of 2012—which would have increased its capacity to a total of ninety inspectors on staff.²²¹ As of December 2012, the department only had “36 full-time inspectors, 8 supervisors with inspection duties, and 9 vacant inspector positions.”²²² Currently, DOGRM has forty-six field inspectors, is in the process of hiring more, and has six additional employees who, although not inspectors, help with field inspection.²²³ Thus, one area that can be improved is simply following through with goals that the agency has set for itself, be it with staffing or creating a new environment of safety compliance and awareness. These are lessons Ohio could heed from watching the experiences in the Gulf.

219. See David Hammer, *Six Fateful Missteps: Several Decisions, Seemingly Separate—And One Final Mechanical Meltdown—Combined to Ignite the Deepwater Horizon Disaster*, TIMES-PICAYUNE, Sept. 5, 2010, at A1 (laying out six errors and a timeline).

220. Rachel Ehrenberg, *The Facts Behind the Frack*, SCIENCE NEWS, Sept. 8, 2012, http://www.sciencenews.org/view/feature/id/343202/description/The_Facts_Behind_the_Frack; see also Russell Gold, *Faulty Wells, Not Fracking, Blamed For Water Pollution*, WALL ST. J., Mar. 25, 2012, <http://online.wsj.com/article/SB10001424052702304537904577277814040731688.html>.

221. Joe Guillen, *Whatever Happened to the State’s Plan to Triple the Number of Oil and Gas Inspectors as Fracking Intensifies in Ohio?*, PLAIN DEALER (Cleveland), Dec. 30, 2012, at B7.

222. *Id.*

223. Telephone Interview by Glenn Morrical with Kelly Robbins, Ohio Dep’t of Natural Res. (May 3, 2013).

III. EMERGENCY PLANNING AND PREPAREDNESS

The third lesson from the Gulf from which Ohio should learn is the importance of emergency preparedness and planning for disaster. In the Gulf, the quality of planning and preparedness for disaster was shameful. By focusing on that lack of planning and its disastrous result in the Gulf, perhaps Ohio agencies, organizations, businesses, and lawmakers can improve their emergency planning and preparedness.

A. *Emergency Planning and Preparedness in the Gulf*

Federal law required an emergency response plan for deepwater rigs, but because BP had calculated its “worst case scenario” to be lower than the threshold level required to trigger a site-specific emergency response plan, no such plan was required or created.²²⁴ A fifty-two-page section of the regional plan focused on the *Deepwater Horizon*, but it was vague and unspecific regarding response procedures for the rig.²²⁵ If there had been a site-specific emergency response plan, the plan would have specifically directed rig personnel to precise procedures for handling the spill. Instead, the company was allowed to submit a more generic plan applicable to the entire Gulf of Mexico region, in which it was operating approximately seventy wells and holding hundreds of leases.

The 582-page Gulf Oil Response Plan²²⁶ for the Gulf of Mexico region was not specific to any rig, and had bits copied from plans written for drilling operations in Alaska.²²⁷ It referred to walruses, which live near BP’s Alaskan operations but have no habitat near the Gulf of Mexico.²²⁸ It included nonfunctional contact information, apparently copied from older reports. The plan, to the extent it pertained to the Gulf Region, rather than the coast of Alaska, relied on local resources—local fire response, local boats, and local stores of berms.²²⁹ But it ultimately turned out that there were not enough

224. NICHOLAS P. CHEREMISINOFF & ANTON DAVIETSHIN, EMERGENCY RESPONSE MANAGEMENT OF OFFSHORE OIL SPILLS: GUIDELINES FOR EMERGENCY RESPONDERS 47 (2010).

225. See, e.g., Holbrook Mohr et al., *BP’s Gulf Oil Spill Response Plan Lists the Walrus as a Local Species. Louisiana Gov. Bobby Jindal is Furious*, CHRISTIAN SCI. MONITOR (June 9, 2010), <http://www.csmonitor.com/From-the-news-wires/2010/0609/BP-s-gulf-oil-spill-response-plan-lists-the-walrus-as-a-local-species.-Louisiana-Gov.-Bobby-Jindal-is-furious>.

226. BP, REGIONAL OIL SPILL RESPONSE PLAN—GULF OF MEXICO (2009).

227. DEEP WATER, *supra* note 1, at 84.

228. *Id.*; see also Mohr et al., *supra* note 225 (“Under the heading ‘sensitive biological resources,’ the plan lists marine mammals including walruses, sea otters, sea lions and seals. None lives anywhere near the Gulf.”).

229. DEEP WATER, *supra* note 1, at 84.

boats on the ground (or in the water!), and the operators of those boats were not specifically trained for a disaster of the magnitude that occurred.²³⁰ There weren't enough berms or booms, and the chemical oil dispersants were not easily accessible.²³¹ The spill response and mitigation efforts of the drillers, regulators, and responders was, at least at first, uncoordinated.²³² When disaster struck, emergency plans and preparedness proved insufficient.

The period of time between the first explosion and the final evacuation of the living employees from the rig was wrought with mishaps and unexpected circumstances. Still, employees on the rig have said in the aftermath of the disaster that there had been a strong safety culture on the rig—lots of rules and strict penalties for failure to follow them, and regular safety drills.²³³ Despite this apparent safety culture, it does not appear that employees were trained to handle some of the dangerous eventualities that came to pass when the rig exploded.²³⁴ Furthermore, based upon the number of disastrous or potentially disastrous workplace incidents caused by BP in the past,²³⁵ there seems to be evidence that BP's safety approach was oriented towards individual worker occupational safety, as opposed to overall process safety or major catastrophe prevention.²³⁶ For instance, the Safety Board's report on the Texas City refinery explosion, which occurred in 2005, noted that "while most attention was focused on the injury rate, the overall safety culture and process safety management (PSM) program had serious deficiencies."²³⁷ In

230. *Id.* at 141.

231. *Id.* at 265.

232. *Id.*

233. *See*, JOINT INVESTIGATIVE REPORT, *supra* note 1, at 183–84 (listing testimony from a BP supervisor extolling the safety values engrained by the company's policies). "Notwithstanding BP's health and safety policies . . . the Panel found BP conducted drilling operations at Macondo in a manner that increased the risks of the project." *Id.* at 184.

234. *Id.* at 183–84; *see also* David Barstow, *Deepwater Horizon's Final Hours*, N.Y. TIMES, Dec. 26, 2010, at 1 ("The Horizon was like a Gulf Coast town that regularly rehearsed for Category 1 hurricanes but never contemplated the one-hundred-year storm. The crew members, though expert in responding to the usual range of well problems, were unprepared for a major blowout followed by explosions, fires and a total loss of power.").

235. These incidents included a Texas City refinery explosion, North Sea gas line rupture, and a Scottish main steam pipe rupture, among others. *See* DEEP WATER, *supra* note 1, at 218–19.

236. *Id.* at 218.

237. U.S. CHEM. SAFETY & HAZARD INVESTIGATION BD., INVESTIGATION REPORT: REFINERY EXPLOSION AND FIRE 19 (2005).

addition, there was major confusion regarding the appropriate chain of command for the emergency situation that ensued, which, when compounded with the number of contractors and subcontractors involved in the drilling operations, left fleeing employees unsure about the procedures to be followed.²³⁸

Additionally, it would be irresponsible to discuss the safety culture in the oil and gas industry without mentioning the involvement of the American Petroleum Institute (API). In the United States, the API plays a significant role in developing safety standards for the oil and gas industry.²³⁹ The API, which possesses great technical expertise, produces standards, recommended practices, specifications, codes, technical specifications, reports, and studies.²⁴⁰ The U.S. Department of the Interior formally adopts many of these recommended standards and practices as regulations.²⁴¹ Unfortunately, it has become apparent that the “API’s ability to serve as a reliable standard-setter for drilling safety is compromised by its role as the industry’s principal lobbyist and public policy advocate.”²⁴²

238. *Id.* at 26 (noting BP’s “‘check the box’ mentality” and employees’ fear of reporting potential problems due to possible retaliation).

239. *See* DEEP WATER, *supra* note 1, at 225 (“Since 1924, API has developed industry standards and practices that promote reliability and safety through the use of proven engineering practices. API standards are developed through a collaborative effort among industry experts, technical experts from government, and other interested stakeholders. The industry has helped create more than 500 standards, including some 240 exploration and production standards that address offshore operations.”).

240. *See* AM. PETROL. INST., API 2010 PUBLICATION PROGRAMS AND SERVICES (2010) (listing API standards, recommended practices, equipment specifications, other technical documents, reports, and studies).

241. *See The Deepwater Horizon Incident: Are the Minerals Management Service Regulations Doing the Job?: Oversight Hearing Before the Subcomm. on Energy and Mineral Resources of the H. Comm. on Natural Res.*, 111th Cong. 98 (2010) (statement of Erik Milito, Grp. Dir., Upstream & Indus. Operations, Am. Petrol. Inst.) (“Seventy-eight of these standards are referenced in Minerals Management Service regulations.”). For MMS rulemakings that incorporate industry standards into regulations over time, see Oil and Gas and Sulphur Operations in the Outer Continental Shelf, 61 Fed. Reg. 60,019 (Nov. 26, 1996) (to be codified at 30 C.F.R. pt. 250); Oil and Gas and Sulphur Operations in the Outer Continental Shelf—Pipelines and Pipeline Rights-of-Way, 72 Fed. Reg. 56,442 (Oct. 3, 2007) (to be codified at 30 C.F.R. pts. 250, 253, 254 & 256). *See also* News Release, MMS, Minerals Management Service to Adopt the Latest Edition of Industry Standard on Fixed Offshore Production Platforms (Apr. 21, 2003) *available at* <http://www.boem.gov/boem-newsroom/press-releases/2003/press0421.aspx> (discussing the MMS regulations and proposed amendments to 30 C.F.R. pt. 250).

242. DEEP WATER, *supra* note 1, at 225.

Specifically, because increases in safety requirements often make operations more costly, API regularly resists agency rulemaking that would make operations safer.²⁴³ For instance, the API led the effort to persuade the MMS not to adopt a new regulatory approach known as the Safety and Environmental Management System, advocating instead for continued reliance on voluntary and recommended safety practices.²⁴⁴ Additionally, the API opposed revisions to the incident-reporting rule that would likely have better identified safety risks across the industry.²⁴⁵ “As described by one representative, API-proposed safety standards have increasingly failed to reflect ‘best industry practices’ and have instead expressed the ‘lowest common denominator’—in other words, a standard that almost all operators could readily achieve.”²⁴⁶ It seems clear that in addition to the reorganization of the MMS, agencies at all levels should ensure that the technical experts relied upon for creating safety practices do not have an inherent conflict that could impair their ability to act in the best interest of the public, rather than the regulated industry.

1. Safety Training on the *Deepwater Horizon*

Although rig workers regularly participated in emergency drills and the rig presented an environment that appeared to be focused on safety, operators never prepared for the worst.²⁴⁷ For example, practice drills had not been carried out in the absence of reliable communication technology, as was the case during the disaster, or in circumstances that simulated the total confusion in chains of command that occurred in the wake of the explosion. Further, for all the evacuation drills, “they had never rehearsed inflating and lowering the raft.”²⁴⁸

According to workers on the rig, training sessions contemplated a blowout coming up through only the drilling pipe. This blowout, however, did not play by the rules. “I had no idea it could do what it did,” said floorhand Caleb Holloway.²⁴⁹ As originally designed, the emergency gas detection system should automatically trigger the general master alarm—the shrill warning that signaled for evacuation

243. *Id.* (citing Letter from Allen Verret, Offshore Operators Comm., & Tim Sampson, Am. Petrol. Inst., to the U.S. Minerals Mgmt. Serv. (Sept. 15, 2009)).

244. DEEP WATER, *supra* note 1, at 228.

245. *Id.* (citing an unpublished Commission interview with Elmer Danenberger, a technical consultant in the oil drilling industry and formerly of MMS).

246. *Id.* at 225.

247. Barstow, *supra* note 234.

248. *Id.*

249. *Id.*

of the rig—if it detected high levels of gas.²⁵⁰ Transocean, though, had set the alarm system so that the general master alarm had to be activated manually, rather than automatically.²⁵¹ This was done, apparently, so it wouldn't wake people up at night in the event of an accidental trigger.²⁵²

Another rig worker, Yancy Keplinger, the crew member in charge of monitoring danger alarms on the *Deepwater Horizon*, was on the bridge at the time of the blowout.²⁵³ The alarms, in addition to flashing magenta, were making a warning sound.²⁵⁴ Keplinger testified that he repeatedly attempted to silence the alarms so he could think about what to do next. “I don't think anybody was trained for the massive detectors that were going off that night,” he said.²⁵⁵

Witnesses differ about what exactly happened next. But they agree on a basic point: even with the *Deepwater Horizon* burning, powerless, and gutted by explosions, there was still substantial resistance to the strongest possible measure that might have saved the rig. The Emergency Disconnect System, which operates like an eject button, would have disconnected the rig from the wellhead, removing the fire's fuel source and possibly sealing the well. But according to Chris Pleasant, who was stationed on the bridge, the captain told him, “No, calm down, we're not hitting E.D.S.”²⁵⁶

2. Lack of Clarity in Chain of Command

Apparently, when the rig is “latched-up” to the well, the person in command is a BP employee.²⁵⁷ When the rig is not attached, or it is in a state of emergency, it is considered a sea vessel and the captain is in charge.²⁵⁸ State of emergency, however, is very loosely defined, and according to the Officer Installation Manager “that would be if say

250. U.S. COAST GUARD & MINERALS MGMT. SERV., USCG/MMS MARINE BOARD OF INVESTIGATION INTO THE MARINE CASUALTY, EXPLOSION, FIRE, POLLUTION, AND SINKING OF MOBILE OFFSHORE DRILLING UNIT DEEPWATER HORIZON, WITH LOSS OF LIFE IN THE GULF OF MEXICO 21–22 APRIL 2010 310–11 (2010) [hereinafter COAST GUARD INVESTIGATION].

251. Barstow, *supra* note 234.

252. *Id.*

253. *Deepwater Horizon Incident Joint Investigation, Yancy Keplinger Testimony Part 2*, C-SPAN VIDEO LIBRARY (Oct. 5, 2010), <http://www.c-spanvideo.org/program/295830-3>.

254. *Id.* at 02:31:00–02:33:08.

255. *Id.* at 02:33:50.

256. Barstow, *supra* note 234.

257. COAST GUARD INVESTIGATION, *supra* note 250, at 38.

258. *Id.*

[the captain] thought some of the key personnel were taken out say for this explosion, for instance.”²⁵⁹ There were explicit safety and command protocols for several situations, but not for a situation where it was unclear whether the rig was attached or unattached.²⁶⁰ When the explosion occurred, rendering electronic monitoring equipment and communications systems unreliable or inoperable, employees struggled to determine the proper chain of command and, therefore, the proper safety protocols.²⁶¹ For instance, the vessel’s “written procedures required multiple people jointly to make decisions about how to respond to ‘dangerous’ levels of gas—a term that wasn’t precisely defined—and some members of the crew were unclear about who had authority to initiate an emergency shutdown of the well.”²⁶² In fact, according to some reports, employees were rushing about and shouting to figure out whether the rig was attached, detached, or in an emergency situation, and, therefore, who was in command of the emergency.²⁶³ The situation was, quite understandably, chaotic. This lack of clarity in the chain of command led to many instances of confusion during the immediate blowout crisis, which almost certainly hampered efforts to avert or contain it.

3. Untested Cleanup Methods

Although BP’s response plan called for the use of oil dispersants, the selected dispersants had not been thoroughly tested prior to use. Variations of the dispersants that were ultimately spread by air over the waters of the Gulf and injected underwater near the sources of oil had been tested, but the variety ultimately used was less well understood and was used in unprecedentedly large quantities.²⁶⁴ As a result, the EPA instituted a moratorium on their use partway through the cleanup process to assess the potential effects and

259. *Id.* at 39.

260. *See Keplinger Testimony Part 2, supra* note 253, at 02:33:57.

261. U.S. COAST GUARD INVESTIGATION, *supra* note 250, at 48–49 (discussing the trauma and chaos employees experienced after the explosion).

262. Douglas A. Blackmon et al., *There Was ‘Nobody in Charge,’* WALL ST. J. (May 28, 2010), <http://online.wsj.com/article/SB10001424052748704113504575264721101985024.html>.

263. Jon Espen Skogdalen, Jahon Khorsandi & Jan Erik Vinnem, *Looking Back and Forward—Evacuation, Escape and Rescue (EER) from the Deepwater Horizon Rig 10* (Jan. 2011) (unpublished Deepwater Horizon Study Group Working Paper), *available at* http://ccrm.berkeley.edu/pdfs_papers/DHSGWorkingPapersFeb16-2011/EvacuationEscapeAndRescue%20EER_%20fromDeepwaterHorizonRig-JES_JK_JEV_DHSG-Jan2011.pdf.

264. U.S. COAST GUARD, *BP DEEPWATER HORIZON OIL SPILL: INCIDENT SPECIFIC PREPAREDNESS REVIEW (ISPR) 43* (2011) [hereinafter ISPR].

damages they might cause.²⁶⁵ Because the dispersants required re-evaluation by the EPA, this process delayed the operations that might have led to less oil reaching the shorelines.²⁶⁶ Substantial research had been undertaken on dispersants in the last several decades, but the results of that research were not well communicated to the people running response operations in the Gulf.²⁶⁷ Even so, there were lingering concerns about the high volume of dispersants being deployed and especially their use deep underwater at the wellhead, which was a “novel use” of the dispersant.²⁶⁸ Regardless of the fact that the EPA ultimately found the dispersant safe enough for use in this circumstance, this type of study should have been completed prior to the occurrence of an emergency calling for its use. The afterthought nature of the study delayed what might have been a speedier, more effective response to the event.

4. Insufficient Resources to Implement the Emergency Cleanup Plan

Although emergency safety procedures and cleanup plans were in place in the Gulf, they did not present strategies sufficient, or sometimes even suitable, to the environmental conditions of the Gulf or to the resources available in the area. For example, although the plan called for reliance on local watercraft, the boats in the area were neither sufficiently numerous nor were crews sufficiently trained for the scope of the disaster that occurred.²⁶⁹ Even the on-board firefighters were not sufficiently trained for the circumstances. “We weren’t trained to fight a blowout fire,” said Matt Jacobs, a firefighter who went straight to the lifeboats when the blowout occurred.²⁷⁰

In addition, the response plans called, in part, for the use of berms to stop oil from flowing into the coastline.²⁷¹ Although berms can be quite effective in flat, calm water, they are predictably less effective when water is choppy.²⁷² So, they work well in lakes but are less effective in the ocean.

The plan, such as it was, did not present a “worst-case scenario” strategy that was executable on the ground—or water. BP’s oil-spill response plan for the Gulf of Mexico was outdated, unreliable and incomplete. For example, BP “claimed that response vessels provided

265. *Id.* at 42.

266. *Id.* at 41.

267. *Id.* at 40.

268. *Id.* at 42.

269. *Id.* at 104.

270. Barstow, *supra* note 234.

271. *See* DEEP WATER, *supra* note 1, at 153–57.

272. *Id.* at 169, 271.

by the Marine Spill Response Corporation and other private oil-spill removal organizations could recover nearly 500,000 barrels of oil per day.²⁷³ This proved not to be true.²⁷⁴ Though incremental improvements in skimming and boom technologies had been realized in the intervening twenty-one years, the technologies proposed for use in response to the *Deepwater Horizon* and *Exxon Valdez* oil spills were largely the same.²⁷⁵ The plan was outdated. For example, it called on noted experimental biologist Peter Lutz to be its wildlife expert, but he had died several years before the plan was submitted.²⁷⁶

MMS was the sole government agency charged with understanding deepwater wells and related [drilling or safety] technology, such as [blowout preventers]. But its supervision of the containment effort was limited, in line with its role in overseeing deepwater drilling more generally. Its staff did not attempt to dictate whether BP should perform an operation, determine whether it had a significant likelihood of success, or suggest consideration of other options. This limited role stemmed in part from a lack of resources. At most, MMS had four to five employees in Houston trying to oversee BP's efforts. One employee described his experience as akin to standing in a hurricane.²⁷⁷

And the cleanup response, some have argued, was more politically motivated than it was focused on the environment. Ultimately, Coast Guard responders distributed many miles of boom according to political, rather than operational, imperatives. They reported feeling trapped “by the outrage that resulted when a parish or state felt slighted by allocation decisions, so they placed boom wherever they could.”²⁷⁸

273. *Id.* at 132.

274. *See BP's Role*, NAT'L COMM'N ON THE BP DEEPWATER HORIZON OIL SPILL AND OFFSHORE DRILLING, <http://www.oilspillcommission.gov/media/response/institutional-bps-role.html> (last visited Mar. 20, 2013) (“Despite these claims, the oil-spill removal organizations were quickly outmatched.”). If the recovery rate was truly 500,000 barrels a day, response personnel should easily have recovered the 35,000 to 60,000 barrels a day that was flowing out. FLOW RATE TECHNICAL GRP., U.S. DEP'T OF THE INTERIOR, ASSESSMENT OF FLOW RATE ESTIMATES FOR THE DEEPWATER HORIZON/MACONDO WELL OIL SPILL 1 (2011).

275. Henry Fountain, *Since Exxon Valdez, Little Has Changed in Cleaning Spills*, N.Y. TIMES, June 25, 2010, at A23.

276. DEEP WATER, *supra* note 1, at 133.

277. *Id.* at 135.

278. *Id.* at 153.

5. Lack of Regionally Unified Spill Response

Another problematic area with regard to emergency preparedness was the lack of a regionally unified oil spill response. Despite the federal efforts, the affected Gulf States each undertook a cleanup operation with an individually focused agenda, so the efforts were not particularly cohesive. For instance, as the states were working to curtail the effects of the spill, local organizers were pushing them to adopt solutions that would create jobs for their local economy. Gulf state governors and other state political officials participated in the response in unprecedented ways, often “taking [important] decisions out of the hands of career oil spill responders”²⁷⁹ and making politically expedient decisions, such as those that would create the most work for individuals—their constituents.²⁸⁰ These high-level state officials, usually politicians, were unfamiliar with oil-spill-response planning.²⁸¹ In Louisiana, for example, the state government declined to empower the officials assigned to work with federal responders within the Unified Coast Guard Command with decision-making authority. Specifically, Louisiana did not even allow those representatives to approve the daily agenda of response activities.²⁸² Instead, Louisiana required that most decisions go through its own Governor’s office.²⁸³

B. Emergency Preparedness, Planning, and Risk Management in Ohio

In Ohio, the ODNR, which has statutory “sole and exclusive authority” to regulate oil and gas drilling operations, does not require specific emergency plans for those operations. To aid emergency crews, however, the ODNR maintains a website designed to allow “emergency response personnel and planners to find well locations and detailed well information, as well as contacts and phone numbers for emergency situations.”²⁸⁴ According to the site, its purpose is to

279. *Id.* at 138.

280. *Id.* at 138–39, 140–41.

281. ISPR, *supra* note 264, at 6.

282. *See* COASTAL PROT. & RESTORATION AUTH. OF LA., STATE OF LOUISIANA INITIAL OIL SPILL RESPONSE PLAN, DEEPWATER HORIZON INCIDENT 2 (2010) (“[T]he latest intelligence information on oil location and forecasts will drive the location and intensity of activity. It is assumed that the logistics and coordination will be executed by the [local response organizations] tasked with the effort.”).

283. *See id.* (describing the process through which local response organizations were to funnel their decisions through state executive agencies).

284. *Emergency Response*, OHIO DEP’T OF NATURAL RES., <http://oilandgas.ohiodnr.gov/Well-Information/Emergency-Response.aspx> (last visited Apr. 6, 2013).

improve response times to oil and gas well emergencies by oil and gas well owners, state regulatory personnel and local emergency responders to reduce public health and environmental risks[,] . . . facilitate full compliance with spill reporting requirements[,] . . . [and] eliminate burdensome Community-Right-To-Know paper reporting requirements while providing a more efficient, convenient and comprehensive information system for local officials.²⁸⁵

This is helpful, for sure, but it is not a site-specific, well-planned emergency response plan.

The federal Spill Prevention Control and Countermeasure (SPCC) program also pertains to emergency response planning for oil and gas handlers in Ohio.²⁸⁶ Because Ohio has not created its own rules under the SPCC program, facilities in the state that are subject to SPCC requirements must satisfy the default federal rules.²⁸⁷ SPCC rules specifically cover oil drilling, production, and refining facilities and require them to prepare an emergency plan if, due to the facility's location, a spill "could reasonably be expected to reach a waterway" or sewer.²⁸⁸ Plans must be written to show how a facility would control a spill, including, for example, "a written commitment of manpower, equipment and materials to expeditiously control and remove any amount of oil that may be spilled."²⁸⁹ These rules would apply to many Ohio shale operations. Still, although Ohio EPA's Division of Emergency and Remedial Response is responsible for conducting investigations on behalf of the federal SPCC program,²⁹⁰ the agency does not actually approve SPCC plans. Rather, the facility itself verifies, through a management sign-off, that its SPCC plan is properly implemented and meets the federal requirements.²⁹¹ To reiterate, the rules require the facility to prepare a plan, but they do not require that any regulator approve it, or even read it.

285. *Id.*

286. OFFICE OF COMPLIANCE ASSISTANCE & POLLUTION PREVENTION, OHIO EPA, UNDERSTANDING THE SPILL PREVENTION, CONTROL AND COUNTERMEASURE (SPCC) REQUIREMENTS 1–2 (2009).

287. *See id.* at 3 (discussing how the Ohio EPA does not approve SPCC plans, but does require entities that release large quantities of oil to submit such plans to the U.S. EPA).

288. *Id.* at 1.

289. *Id.* at 2.

290. *Regulation of Above Ground Oil and Petroleum Product Storage Tanks*, OHIO EPA, http://ohioepa.custhelp.com/app/answers/detail/a_id/308/~regulation-of-above-ground-oil-and-petroleum-product-storage-tanks (last visited Apr. 6, 2013).

291. OFFICE OF COMPLIANCE ASSISTANCE & POLLUTION PREVENTION, *supra* note 286, at 3.

With regard to reporting requirements, which, when made publically available can help with safety and emergency planning, Ohio's

SB 165 requires the operator to submit, along with the well completion report, copies of the well stimulation log, the fracture pressure chart and the invoices, which provide a record of what happened on the job, including materials that were used, when they were used, and in what volumes, as well as whether well integrity has been maintained throughout the operation.²⁹²

The bill also required the DMRM²⁹³ to maintain Material Safety Data Sheet (MSDS) information on chemicals used in the fracturing process.²⁹⁴ If a chemical used in fracturing is one for which the agency does not already have an MSDS, the operator must obtain a copy of the applicable MSDS and provide it.²⁹⁵ This information is important because it is used by emergency responders in the event of a spill or other incident. Senate Bill 315 also added a requirement for including Chemical Abstract Services (CAS) numbers,²⁹⁶ and although DOGRM has this requirement, a proprietary secrets exemption

292. STRONGER, *supra* note 149, at 4.

293. Note that although S.B. 165 referred to the ODNR Division of Resources Management, H.B. 153 later created a separate Division of Oil and Gas Resources Management, which has taken over these statutory obligations.

294. *Id.* at 14.

295. *Id.*; see also OHIO REV. CODE ANN. § 1509.10(E) (West 2012) (“If a material listed or designated under division (A)(9) or (10) or (B)(3) of this section is a material for which the division of oil and gas resources management does not have a material safety data sheet, the owner shall provide a copy of the material safety data sheet for the material to the chief.”)

296. See STRONGER, *supra* note 149, at 14 (discussing how DMRM was considering adding a requirement for the CAS numbers in January 2011); see also Mike Chadsey, *Improved Regulations Set the Stage for Increased Shale Development*, ENERGY IN DEPTH (Sept. 8, 2012), <http://www.eidohio.org/senate-bill-315-in-the-books> (“The additives used must be disclosed to the Division of Mineral Resource Management (DMRM)”); OHIO REV. CODE ANN. § 1509.10(A)(9) (“[T]he owner shall include a list of all chemicals, not including any information that is designated as a trade secret pursuant to division (I)(1) of this section, intentionally added to all products, fluids, or substances and include each chemical’s corresponding chemical abstracts service number and the maximum concentration of each chemical. The owner shall obtain the chemical information, not including any information that is designated as a trade secret pursuant to division (I)(1) of this section, from the company that drilled the well, provided service at the well, or supplied the chemicals.”).

remains.²⁹⁷ If specific chemical constituents of hydraulic fracturing fluids are not included on the MSDS, the agency can request submission of the specific chemical information. If the operator does not submit this chemical information, the agencies may impose penalties.²⁹⁸

However, the MSDS does not always contain the precise chemical elements of a listed product.²⁹⁹ DOGRM should consider this problem—whether the agency will be receiving all the chemical information necessary for sufficient investigation and emergency response from the MSDS alone.³⁰⁰ Additional information may be necessary for adequate emergency response, particularly for medical

297. OHIO REV. CODE ANN. § 1509.10(I)(1) (“The owner of a well who is required to submit a well completion record under division (A) of this section or a report under division (B)(3) of this section or a person that provides information to the owner as described in and for purposes of division (A)(9) or (10) or (B)(3) of this section may designate without disclosing on a form prescribed by the chief and *withhold from disclosure to the chief the identity, amount, concentration, or purpose of any product, fluid, or substance or of any chemical component in a product, fluid, or substance designated as a trade secret . . .*” (emphasis added)).

298. See OHIO REV. CODE ANN. § 1509.99(A) (“Whoever violates sections 1509.01 to 1509.31 of the Revised Code or any rules adopted or orders or terms or conditions of a permit issued pursuant to these sections for which no specific penalty is provided in this section shall be fined not less than one hundred nor more than one thousand dollars for a first offense; for each subsequent offense the person shall be fined not less than two hundred nor more than two thousand dollars.”).

299. See *generally* MATTHEW MCFEELEY, NATURAL RES. DEF. COUNCIL, STATE HYDRAULIC FRACTURING DISCLOSURE RULES AND ENFORCEMENT: A COMPARISON (2012) (discussing the rules employed by various states regarding disclosure of the chemicals used in fracking).

300. See Hazard Communication, 29 C.F.R. § 1910.1200 (2012). Section (c), which lists definitions, supports the assertion that OSHA’s regulations that govern MSDSs limit the information operators must disclose. The reason is that only “hazardous chemicals” need to be disclosed on MSDSs, and a chemical must have been subject to significant testing before it will be considered hazardous under the applicable regulations. But there is no requirement that the chemicals used in the exploration and production of shale oil and gas be subjected to this important analysis, and they therefore are not declared hazardous nor required to be disclosed on MSDSs. *Id.*; see also Earthjustice, Citizen Petition Under Toxic Substances Control Act, regarding the Chemical Substances and Mixtures Used in Oil and Gas Exploration or Production 7 (Aug. 4, 2011), available at http://www.epa.gov/oppt/chemtest/pubs/Section_21_Petition_on_Oil_Gas_Drilling_and_Fracking_Chemicals8.4.2011.pdf (discussing that the requirement that only “hazardous materials” need to be disclosed on MSDSs presents a major problem, because MSDSs are one of the public’s primary hazardous chemical accountability mechanisms).

treatment. Ohio is an early adopter of regulations that require operators to disclose all chemicals used in the fracturing fluid, even those that amount to trade secrets, in instances of medical necessity.³⁰¹ The problem is that operators purchase fracturing fluid from vendors who maintain proprietary secrecy over the formulation of the fluid. Operators claim that they cannot disclose what they do not know. So, the system needs work.

Related to safety issues surrounding a damaged well, Ohio law allows the Chief of DMRM (now DOGRM) to order the plugging of a well that has been irreparably damaged.³⁰² In an emergency, the agency can deliver plugging order electronically in as little as thirty minutes. If an order is issued, the company must obtain a plugging permit and provide notice to DMRM (now DOGRM) at least forty-eight hours prior to plugging.³⁰³ If an operator fails to take action to plug a well within a reasonable period of time, DMRM (now DOGRM) may plug the well on its own, with costs of that action to be reimbursed by the operator. An inspector must be on site to witness plugging unless DMRM (now DOGRM) waives this requirement.³⁰⁴

301. Ohio, like most states, has given industry a “free pass” under a trade secrets exemption, and includes no process for factual justification of a trade secrets claim for nondisclosure of fracturing chemicals. Still, Ohio does provide for access to trade secret information for health care providers and does not require that medical professionals sign a confidentiality agreement to get that information. The medical professional is prohibited by law from sharing confidential information regarding the nature of chemical involved. McFeeley, *supra* note 299, at 12–13 (citing OHIO REV. CODE ANN. § 1509.10(H)(2), *amended by* S.B. 315, 129th Gen. Assemb., Reg. Sess. (Ohio 2012)); *see also* ZEHRINGER, *supra* note 142 (discussing the changes in S.B. 315).

302. *See* OHIO REV. CODE ANN. § 1509.12:

When the chief finds that a well should be plugged, the chief shall notify the owner to that effect by order in writing and shall specify in such order a reasonable time within which to comply. No owner shall fail or refuse to plug a well within the time specified in the order. Each day on which such a well remains unplugged thereafter constitutes a separate offense.

Where the plugging method prescribed by rules adopted pursuant to section 1509.15 of the Revised Code cannot be applied or if applied would be ineffective in carrying out the protection that the law is meant to give, the chief, by order, may designate a different method of plugging. The abandonment report shall show the manner in which the well was plugged.

303. *See* OHIO REV. CODE ANN. § 1509.13(A) (“No person shall plug and abandon a well without having a permit to do so issued by the chief of the division of oil and gas resources management.”).

304. STRONGER, *supra* note 149, at 5; *see also* OHIO REV. CODE ANN. § 1509.13(C) (“No well shall be plugged and abandoned without an oil

Despite these positive steps in Ohio, to assure proper preparedness, Ohio should consider requiring customized emergency plans to fit the distinctive characteristics presented by the particular ecosystem of each well. These plans, assuming that they can be created and that they are well prepared, forward thinking, risk averse, accessible, and well communicated to those responsible for implementation, would be a good thing. It would have been better, in the Gulf, if emergency plans had been site specific, reviewed, and implemented. Ohio should learn from this example. It should require site-specific plans that accurately evaluate risk, identify response procedures, verify the training and availability of local response resources, and communicate with responders.

To avoid the emergency planning inadequacies that arose in the Gulf, Ohio must be sure that emergency plans and procedures are well supported both in research and in the level of training and preparedness of the local resources on which the plans depend. Thus, it might be beneficial to perform a thorough study of how Ohio's ecosystem would handle the various types of environmental consequences that could, in a worst-case scenario, arise as a result of a problem with a shale well. And, at a minimum, local emergency responders should be sufficiently numerous, informed, and prepared to act. Currently, state law requires the ODNR to inform county engineers and municipalities when a well is operational or when a company is preparing to drill a well in their area.³⁰⁵ To my knowledge, it requires no further follow-up or planning.

To address the problem of on-the-ground resources, it might make sense for Ohio to do an inventory of fire suppression equipment in the region around each potential well. Also, Ohio needs a method for ensuring the adequacy of specialized training for local fire departments, so they can be prepared to respond effectively to an oil and gas accident at a well.³⁰⁶ At this point, the quality and level of coordination among the ODNR, local responders, and the Ohio EPA

and gas resources inspector present unless permission has been granted by the chief.”).

305. OHIO REV. CODE ANN. § 1509.06(B) (discussing the reporting responsibilities of the chief).

306. The Ohio Oil and Gas Energy Education Program (OOGEEP), a nonprofit organization funded exclusively by oil and gas producers operating in Ohio, provides oilfield emergency training programs for local emergency responders. OOGEEP has trained close to 1,000 Ohio firefighters on topics including evaluating the emergency, responding to production site emergencies, and responding to drilling site emergencies. The training programs are free and approved for continuing education for firefighters. See *Responding to Oilfield Emergencies Training*, OOGEEP.org, <http://oogEEP.org/event/firefighters-event-1/> (last visited May 11, 2013); see also Rhonda Reda, *Responding to Oilfield Emergencies in Ohio*, INCOMMAND, Apr./May/June 2013, at 24.

is very unclear. Even if Ohio fails to institute a system of site-specific emergency planning, it should work on formal coordination of emergency planning and response efforts. There has been little, if any, coordination of emergency planning among the ODNR, Ohio EPA, drillers, and local emergency responders. Groups of County Engineers have developed and entered into agreements to require drilling companies to repair county roads.³⁰⁷ Ohio would benefit from similar coordination in efforts to prepare and plan for emergencies.

CONCLUSION

This Article presented three lessons that should have been learned from the BP Gulf oil spill disaster that began in the Gulf of Mexico on April 10, 2010. The *Deepwater Horizon* exploded and sank, killing eleven crewmembers and spewing oil into the Gulf waters and onto the Gulf coastline. Government and corporate teams have produced volumes of reports on their investigations of the events leading to the disaster, and responses to it, and their recommendations going forward. This Article highlighted three of the issues they identified and applied them to the developing shale industry in Ohio. It began by addressing internal conflicts of interest within the federal government's primarily responsible agency, the U.S. Department of the Interior's Minerals Management Service. It addressed failures in the Gulf to follow through on research or investigations that clearly were indicated as necessary and may have prevented disaster, responsibility for which lay both with the companies involved in the accident and the responsible agency. Finally, it addressed emergency planning and preparedness for disaster, which emerged as woefully inadequate in the Gulf. As Ohio moves quickly in developing its potentially lucrative shale oil and gas resources, Ohio should learn from the events in the Gulf and prevent accidents that could occur here, leading to loss of life and damage to the environment.

In particular, this Article addressed the federal agency structure that was at work in the Gulf at the time of the disaster. It highlighted the role of the U.S. Department of the Interior's Minerals Management Service, and focused on conflicts of interest within the MMS. The MMS developed the regulations applicable to deepwater drilling, and it was also responsible for encouraging production of Gulf

307. See, e.g., Mark Law, *County Requires Prevailing Wages*, INTELLIGENCER (Wheeling, W. Va.), Jan. 7, 2013, <http://www.theintelligencer.net/page/content.detail/id/579567/County-Requires-Prevailing-Wages.html?nav=510> ("Jefferson County commissioners signed a road maintenance agreement with a company looking to build a large pipeline associated with the gas drilling industry across the county that requires contractors to pay prevailing wages to improve or repair county and township roads used in the construction process.").

(and other) oil resources, and that responsibility included the leasing of drilling locations and the collection of revenues associated with production at those sites. Its responsibilities in leasing and revenue generation, which supported its role in encouraging production, and its responsibilities in regulation and enforcement, fundamentally conflicted with one another. In effect, MMS was attempting to carry out its duty to earn revenue for the U.S. Treasury by developing U.S. oil resources, while at the same time carrying out its duty to control the safety of the operations through the creation and enforcement of regulations. This conflict, coupled with other problems, such as underfunding, presented tensions that were unsustainable.

Ohio's agency structure, although similar in some important ways to the federal system, does not present the fundamental internal conflict-of-interest problems that were so apparent at the federal level. Although ODNR has statutory "sole and exclusive authority" to regulate the shale oil and gas operations in the state, ODNR, unlike MMS, does not handle leasing or revenue collection. But Ohio's system of granting "sole and exclusive authority" to ODNR presents problems that are potentially in conflict with Ohio's constitutional home rule provision³⁰⁸ because the legislature attempted, by statute, to eliminate all local regulation of oil and gas exploration and development. That is an issue for another day.

The second lesson this Article addressed is that of the critical need to learn from what we experienced. I called this a lesson in research and follow-through. In the Gulf, the parties involved should have been aware that pressure problems were occurring in the well. They had experienced pressure problems previously at the same well, but there was not sufficient research to determine the causes of problem and thereby prevent a devastating reoccurrence. Although much was known in the Gulf about advances in deep-sea drilling, questions clearly remained about drilling and cementing techniques, which ultimately proved to be problematic. In Ohio, although much is known both about drilling for oil and gas in shale, and about hydraulic fracturing, the combination of these two techniques is not yet well studied. It is well known that accidents have occurred in the hydraulic fracturing of shale. There are not many, but it happens, and Ohio should attempt to learn from the shale well blowouts in, for example, North Dakota, which have damaged local drinking water aquifers. Ohio should also work to improve cleanup protocols. There are still many unknowns in Ohio regarding the potential effects of a blowout, either at a shale wellhead or "downhole" in the well, and the ecosystems that would be damaged by this kind of event. We could learn more about cleanup techniques suitable to the ecosystems in which shale wells are located. Ohio could work on follow-through—for

308. OHIO CONST. art. XVIII, § 3.

example, by ensuring that the extra inspectors that were promised by statute are actually hired and that the chemical disclosure programs that have been discussed come to fruition.

Finally, this Article considered lessons in emergency preparedness. It is well known that the governments and companies involved in the blowout in the Gulf were shamefully unprepared, at least in the first instance, to respond to a disaster of the magnitude that occurred. Emergency plans were not site specific. There were insufficient resources on the ground (and in the water). Cleanup systems were not well understood for the environment in question. Ohio could learn from these inadequacies and build a system of site-specific emergency plans in which Ohioans accurately identify and prepare for worst-case accidents at individual sites and thereby ensure that communication systems are functional and resources are adequately trained and ready to respond.

In these ways, and certainly in countless others, Ohio can learn from mistakes that were made in the Gulf. As Ohio moves quickly and decisively in developing its rich shale oil and gas resources, it should continue to act deliberately. It should pay close attention to research needs, enforcement priorities, and emergency planning.



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