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ENVIRONMENTAL ISSUES ASSOCIATED WITH DISASTER PLANNING AND RESPONSE*

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Abstract

The breadth, detail, and complexity of environmental laws makes compliance and risk-minimization challenging even under normal circumstances. The task becomes significantly more daunting when a natural disaster strikes, such as the saga of the Arkema chemical plant during and after Hurricane Harvey illustrates. An industrial accident there resulted in an explosion and fire, which sickened first responders, led to the evacuation of everyone within a mile-and-half of the facility, and resulted in indictments of the company that owned the facility, its CEO, and the plant manager.

The Arkema incident serves as a cautionary tale for regulated industries demonstrating the need to prepare well-thought out responses for natural disasters—a need that will only grow as climate change increases the frequency and the magnitude of storm events. This paper first discusses the incident at Arkema, then provides a high-level overview of some of the regulatory obligations, liabilities, and defenses pertinent to regulated industries before, during, and after a disaster strikes. It then discusses emerging issues relating to climate change and the use of per- and poly-fluorinated alkyl compounds to fight fires and offers a conclusion and recommendation.

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*The "before, during, and after analysis" in Part II, Relevance of Environmental Laws to Natural Disasters—Regulatory Obligations, Liabilities, and Defenses is an outgrowth of work of the American College of Environmental Lawyers Disaster Planning and Response Task Force and, in particular, of papers presented at a regional meeting of the college in conjunction with the Murrah Center for Homeland Security Law & Policy, 2019 National Summit on Homeland Security Law. For the agenda of the topics covered by that summit, see http://murrahcenter.org/summit/.

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Hurricane Harvey and Arkema

Hurricane Harvey made landfall in Texas on August 25, 2017. The wettest tropical cyclone in U.S. history, it dumped over four feet of rain in the Houston area and caused about $125 billion in damages in total—mostly from catastrophic flooding. As Houston has the largest concentration of petrochemical manufacturing in the world, it is unsurprising the storm and its aftermath resulted in numerous unpermitted chemical releases.[2]

The Arkema plant—located nearby in Crosby, Texas—manufactured organic peroxides, which need to be kept below freezing to prevent them from decomposing and catching fire.[3] The potential dangers from the plant were known because a January 2016 analysis by the *Houston Chronicle* and Texas A&M University identified the Arkema facility as a risk for harm to the public.[4]

When Harvey hit in the Summer of 2017, its heavy rainfall caused the plant to lose power. The peroxides were placed in refrigerated trailers, which Arkema tried to move to higher ground. Three trailers could not be moved to higher ground and lost refrigeration, and the chemicals stored in them heated up and caught fire, leading to an explosion on August 31, 2017.[5]

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[1] The indictments were for reckless emission of an air contaminant and endangering first responders. Office of the District Attorney, Harris County, Texas, Arkema Indicted for Toxic Cloud, Aug. 3, 2018, https://app.dao.hctx.net/arkema-indicted-toxic-cloud.

[2] Over 8 million pounds of air pollution released. Jeff Mosier, *Texas plants spewed 8 million pounds of air pollutants as Hurricane Harvey hit*, PITTSBURGH POST-GAZETTE, Aug. 16, 2018, https://www.post-gazette.com/business/powersource/2018/08/16/Texas-plants-spewed-8-million-pounds-of-air-pollutants-as-Hurricane-Harvey-hit/stories/201808160196.

[3] Christopher Mele, *Chemical Maker and Its Chief Indicted for Explosions During Hurricane Harvey*, N.Y. TIMES, Aug. 3, 2018, https://www.nytimes.com/2018/08/03/business/arkema-chemical-plant-explosion-texas.html.

[4] M. Sam Mannan *et al*., Ranking of Chemical Facilities Based on the Potential to Cause Harm to the Public (Jan. 2016), https://assets.documentcloud.org/documents/2822336/PCHP-Report-Updated-Edited-on-050216.pdf.

[5] Christopher Mele, *Chemical Maker and Its Chief Indicted for Explosions During Hurricane Harvey*, N.Y. TIMES, Aug. 3, 2018, https://www.nytimes.com/2018/08/03/business/arkema-chemical-plant-explosion-texas.html.

The fire led to a week-long evacuation of over two hundred residents, and twenty-one people sought medical treatment for exposure to smoke and chemicals.[6] First responders filed lawsuits against Arkema for damage to their health.[7] Local residents followed with their own actions, alleging air and water contamination causing respiratory problems, pneumonia, headaches, nausea, and dizziness.[8] Texas authorities charged company officials with reckless emission of air contaminant and endangerment of persons under the Texas Water Code;[9] the U.S. Chemical Safety Board and the Texas Commission on Environmental Quality each opened investigations.[10]

Factual Overview

Before discussing regulatory issues associated with natural disasters, it is useful to define the term and provide context. There are any number of definitions.

The Federal Emergency Management Agency ("**FEMA**") relies on a statutory definition of "major disaster" under the Robert T. Stafford Disaster Relief and Emergency Assistance Act ("**Stafford Act**"):

> "Major disaster" means any natural catastrophe (including any hurricane, tornado, storm, high water, winddriven water, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm, or drought), or, regardless of cause, any fire, flood, or explosion, in any part of the United States, which in the determination of the President causes damage of sufficient severity and magnitude to warrant major disaster assistance under this chapter to supplement the efforts and available resources of States, local governments, and disaster relief organizations in alleviating the damage, loss, hardship, or suffering caused thereby.[11]

In more general terms, the term "disaster" is defined by the International Federation of Red Cross and Red Crescent Societies as "a sudden, calamitous event that seriously disrupts the functioning of a community or society and causes human, material, and economic or environmental losses that exceed a community's or society's ability to cope using its own resources" that can be caused by nature as well as having human origins.[12] A more specialized, related term—"environmental emergencies"—is defined as "sudden-onset disasters or accidents resulting from natural,

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6 *Id*.

7 Melody M. Bomgardner, *First responders sue Arkema*, CHEMICAL & ENGINEERING NEWS, Sept. 11, 2017, https://cen.acs.org/articles/95/web/2017/09/First-responders-sue-Arkema.html.

8 Emma Platoff, *Lawsuits over Arkema Chemical Disaster in Texas Add Up*, INS. J., Apr. 3, 2018, https://www.insurancejournal.com/news/southcentral/2018/04/03/485171.htm

9 Perla Trevizo, Arkema hit with new criminal charges in 2017 plant fire during Harvey, Houston Chronical, Apr. 10, 2019, https://www.chron.com/news/houston-texas/houston/article/Arkema-hit-with-new-criminal-charges-in-2017-fire-13756762.php.

10 U.S. Chemical Safety and Hazard Investigation Board, Organic Peroxide Decomposition, Release, and Fire at Arkema Crosby Following Hurricane Harvey Flooding, Report Number: 2017-08-I-TX (May 2018), https://www.csb.gov/file.aspx?DocumentId=6068; Texas Commission on Environmental Quality, Hurricane Harvey Response: Arkema Chemical Plant, Crosby Texas, https://www.tceq.texas.gov/response/hurricanes/arkema-facility-response.

11 42 U.S.C. § 5122(2); 44 C.F.R. § 206.2(a)(17); *see also* 44 C.F.R. § 206.36.

12 International Federation of Red Cross and Red Crescent Societies, What is a Disaster?, https://www.ifrc.org/en/what-we-do/disaster-management/about-disasters/what-is-a-disaster/

technological or human-induced factors, or a combination of these, that causes or threatens to cause severe environmental damage as well as loss of human lives and property."[13]

In sum, authorities in disaster relief contemplate human- and technology-caused disasters (e.g., tank car derailments, terrorist attacks, and pipeline ruptures) in addition to natural disasters. In the case of Arkema, arguably a combination of the two, produced the catastrophe—a hurricane, which precipitated the incident, and an all-too-human failure to implement an adequate contingency plan to supply back-up power or remove peroxide before the storm hit.

Legal Context

I. Overview of Environmental Laws

Environmental law regulates business activities because of their effects or potential effects on the environment and on human health via the environment. Environment law comprises statutes and the common law—both tort and contract—as well as rules, permits, and judicial and administrative orders.

Environmental statutes take a variety of approaches to protection of human health and the environment.

- Many deal with wastes and their disposition. These so-called pollution statutes include the Clean Water Act ("**CWA**"),[14] the Oil Pollution Act ("**OPA**"),[15] the Clean Air Act ("**CAA**"),[16] the Resource Conservation and Recovery Act ("**RCRA**"),[17] the Underground Injection Control ("**UIC**") Program of the Safe Drinking Water Act ("**SDWA**"),[18] and the Comprehensive Environmental Response, Compensation, and Liability Act ("**CERCLA**" or "**Superfund**").[19]

- Some focus on the use of raw materials and the manufacture, importation, and distribution of products, *e.g.*, the Toxic Substances Control Act ("**TSCA**"),[20] the Federal Insecticide, Fungicide and Rodenticide Act ("**FIFRA**"),[21] the Emergency Planning and Community Right-to-Know Act ("**EPCRA**")[22] of Superfund, as amended by the Superfund Amendments and Reauthorization Act ("**SARA**"), and the drinking water program of the SDWA.[23]

- Others—so-called conservation statutes—require review of proposed activities based on their potential impact on the environment or various segments of it. Examples include the National Environmental Policy

[13] United Nations Environmental Programme, Environmental Management and Disaster Preparedness at 43 (2005), http://www.unep.or.jp/ietc/Publications/DM/wcdr_session_report.pdf.
[14] 33 U.S.C. §§ 1251 *et seq*.
[15] 33 U.S.C. §§ 2701 *et seq*.
[16] 42 U.S.C. §§ 6901 *et seq*.
[17] 42 U.S.C. § § 300h *et seq*.
[18] 42 U.S.C. §§ 300f *et seq*.
[19] 42 U.S.C. §§ 9601 *et seq*.
[20] 15 U.S.C. §§ 2601 *et seq*.
[21] 7U.S.C. §§ 136 *et seq*.
[22] 42 U.S.C. §§ 1100 *et seq.*
[23] The Occupational Safety and Health Act ("**OSHA**") sometimes is also included in this category.

Act ("**NEPA**"),[24] the Endangered Species Act,[25] the Wild and Scenic Rivers Act, and the National Historic Preservation Act.[26]

Environmental statutes generally prescribe standards and contain substantial sanctions for noncompliance. The federal pollution statutes, for example, establish technology-based limitations for pollutant-emitting activities, which may be ratcheted down further, if necessary to protect the environment, and administrative requirements, such as permitting, recordkeeping, and the reporting of routine and emergency releases.

Pollution statutes, consistent with the concept of cooperative federalism, task the federal government with establishing a floor for regulatory requirements—purportedly to prevent states and regulated entities from racing to the bottom—and delegate authority for implementing those programs to those states that promulgate requirements at least as stringent as federal law.[27] States also may have their own independent programs that parallel or supplement federal programs.[28] As a consequence, companies must be knowledgeable about state as well as federal law.

Because the pollution statutes enacted in the 1970s were prescriptive in nature and generally did not deal with problems of the past,[29] Congress enacted Superfund in 1980. Superfund imposes strict and, generally, joint and several liability on so-called potentially responsible parties ("**PRPs**") for the remediation of sites of environmental concern.[30] Thus, a PRP's compliance with the law will not cut off liability, and available Superfund defenses are relatively narrow.[31]

Under the various environmental statutes, civil and criminal liability, as well as Superfund liability, may be imposed on individuals as well as companies.[32] Moreover, both governments and private litigants may bring suit not only for regulatory violations, but also for activities or conditions created by an industry that gives rise to an imminent and substantial endangerment.

The costs of non-compliance can be high and include the possibility of administrative, civil, and criminal sanctions.[33] But substantial, too, are the costs of compliance, in the form of capital and operating expenses for, e.g., required pollution control equipment, and the time and expense for acquiring necessary permits. And, as noted, compliance is not the only basis for liability under

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[24] 42 U.S.C. §§ 4321 *et seq*.

[25] 16 U.S.C. §§ 1531 *et seq*.

[26] 54 U.S.C. §§ 300101 *et seq*.

[27] CWA, OPA, CAA, and the UIC Program are administered by the EPA and by its state counterparts. Superfund is run entirely by the federal government.

[28] For example, Texas regulates the management of industrial as well as hazardous solid waste.

[29] These include CWA, CAA, SWDA, and RCRA.

[30] PRPs include present owners and operators and certain past owners and operators (i.e., those at the time of disposal) of contaminated properties, as well as those who arranged for disposal of their wastes at such properties and transporters who selected those properties for disposal. 42 U.S.C. § 9607(a).

[31] Under the original Superfund act, there were three defenses—act of God, act of war, and act of a third party. 42 U.S.C. § 9607(b) Subsequent amendments added others: The 1986 amendments added an innocent land owner defense, while the 2002 amendments added the bona fide prospective purchaser and contiguous land owner defenses. 42 U.S.C. § 9607(q). The three newest defenses require, among other things, a defendant to show it conducted "all appropriate inquiry" pre-acquisition, has no affiliation with the responsible party, and took all appropriate post-acquisition caretaking; they apply only to purchasers (or lessees) of real estate and not to those who acquire stock.

[32] For example, the definition of "person" under the pollution statutes, includes corporations, partnerships, political subdivisions, and natural persons. 42 U.S.C. § 9601(21).

[33] Sanctions can come in the form of fines, injunctive relief (e.g., orders compelling compliance or prohibiting non-compliant operations), or—for criminal violations—imprisonment.

environmental laws. Under CERCLA and state analogs, as well as OPA,[34] there is additional exposure for costs of investigation and remediation of contamination and for natural resource damages. The common law provides causes of action that expose businesses to suits for toxic tort and property damage as well as for injuries stemming from breaches of contract involving contaminated property.

II. Relevance of Environmental Laws to Natural Disasters—Regulatory Obligations, Liabilities, and Defenses

As noted, compliance and risk minimization present a difficult task even under normal circumstances, and the challenge grows when a natural disaster strikes and greatly increases the potential for an unauthorized release of contaminants. Many environmental statutes, especially the pollution statutes, prescribe conditions not only for routine releases, but also to lessen the potential for, and magnitude of, accidental releases. They do so with provisions that impose requirements dealing with preventing and responding to accidental releases of contaminants, regardless of whether the cause is natural, human, or technological. A number impose planning requirements; others require release notification or response. Recognizing that not all releases are preventable, some environmental statutes provide defenses for accidental releases, especially for those relating to acts of God.

The time for a regulated business to start thinking about regulatory obligations and liabilities, or risk avoidance and minimization, is not when news breaks of a natural disaster bearing down on one of its facilities. Regulated industries need to identify all pertinent regulatory requirements, including those that pertain to potential accidental as well as routine releases, before they commence operations. Regulatory compliance should help reduce risks.

Prudent companies will go beyond compliance to be sure they have taken all practicable steps to minimize risk before, during, and after a natural disaster strikes. They will identify the types of natural disasters that might strike and develop continency plans to address them before opening a facility. After operations begin, they will revisit their plans to make sure that they not only appear effective on paper, but also are effective in practice—through practice. In developing those plans, industries must consider procedures mandated by the statutes and regulations under which they operate.

A. Before

Regulatory programs that provide for planning requirements for regulated industries include:

- EPCRA, a statute responding to concerns about environmental and safety hazards posed by the storage and handling of toxic chemicals passed in the wake of the 1984 disaster in Bhopal, India. Sections 301 to 303, as implemented by 40 C.F.R. Part 355 (Emergency Planning and Notification), Subpart B, require (1) local governments to prepare emergency response plans and review them annually; (2) state governments to oversee and coordinate local planning efforts; and (3) facilities maintaining certain amounts of

[34] OPA provides for damages broader than other environmental statutes, including for loss of subsistence use of natural resources, damages to real or personal property, loss of profits or earning capacity, loss of government revenues, and increased cost of public services. 33 U.S.C. § 2702(b)(2).

extremely hazardous substances to notify state and local emergency response commissions and to cooperate in emergency plan preparation.

- CWA, a statute establishing the basic structure for regulating discharges of pollutants into the waters of the United States and implementing quality standards for surface waters. Section 311, as implemented by 40 C.F.R. Part 112 (Oil Pollution Prevention), requires certain owners and operators of onshore or offshore facilities to prepare and implement Spill Prevention, Control, and Countermeasure Plans and others, Facility Response Plans..

- CAA, a statute designed to control air pollution on a national level by setting national ambient air quality standards and requiring states to adopt enforceable plans to achieve and maintain air quality. Section 112(r), implemented by 40 C.F.R. Part 68 (Chemical Accident Prevention Provisions), requires facilities that use an Extremely Hazardous Substance ("**EHS**") to develop a Risk Management Plan ("**RMP**"), then revise and resubmit them every five years. Section 112(r)(1) additionally imposes a general duty on stationary source owners and operators "to prevent the accidental release and to minimize the consequence of any such release of [listed] substances or any other extremely hazardous substance."

- RCRA, a statute establishing a framework for a national system of solid waste control that includes both non-hazardous solid waste requirements and hazardous solid waste requirements. Section 3004, implemented by 40 C.F.R. Part 264, Subpart C (Preparedness and Prevention), requires owners and operators of hazardous waste treatment, storage, and disposal facilities to maintain their facilities in a way designed to minimize the possibility of an emergency and ensure that resources are available to handle an emergency. Section 3004, implemented by 40 C.F.R. Part 264, Subpart D (Contingency Plans and Emergency Procedures), requires owners and operators to develop contingency plans to minimize unanticipated damage from their treatment, storage, or disposal of hazardous waste.

- The Homeland Security Act,[35] a statute designed to reduce the vulnerability of the United States to terrorism, minimize damage from terrorist attacks, and assist recovery from such attacks that was introduced in the wake of September 11. The regulation implemented as 6 C.F.R. Part 27 (Chemical Facility Anti-Terrorism Standards) promulgated pursuant to Section 622, requires a chemical facility, possessing threshold amounts of listed chemicals, to conduct a security vulnerability assessment of its operations, and submit either a site security plan or alternative security plan that meets the Chemical Facility Anti-Terrorism and Risk-Based Performance Standards.

- The National Oil and Hazardous Substances Pollution Contingency Plan ("**NCP**"), a blueprint for responding to oil spills and hazardous substance releases that developed in response to a massive oil spill near the English coast from the *Torrey Canyon* oil tanker. Created pursuant to CERCLA and CWA, as amended by OPA, and implemented in 40 C.F.R. Part 300, this statutory program provides an organization structure and procedure for preparing for,

[35] 6 U.S.C. §§ 101 *et seq.*

and responding to, discharges of oil and releases of hazardous substances, pollutants, and contaminants. In addition, it includes regulations in 40 C.F.R. Part 109 that were created to assist state, local, and regional agencies to develop oil removal contingency plans in consultation with private interests.

These programs all push the regulated community to be aware of the possibility of disasters and take proactive measures to prevent accidents from becoming catastrophes. Simply put, these laws encourage the regulated community to identify and address potential concerns and to deal with any consequences, including, as discussed below, providing appropriate notifications and taking appropriate actions.

B. During

Many of the referenced regulatory programs contain release reporting and response requirements, including:

- EPCRA Section 304, implemented by 40 C.F.R. Part 355 (Emergency Planning and Notification) Subpart C. This regulation requires facilities to notify the State Emergency Response Commission ("**SERC**") and Local Emergency Planning Committee ("**LEPC**") for any area likely to be affected by any release of an EHS at or above its applicable reportable quantity and additionally notify the National Response Center ("**NRC**") of a release of a CERCLA-listed hazardous substance.

- RCRA, as implemented by 40 C.F.R. Section 270.30(l)(6). This regulation requires a provision in all permits compelling a permittee that becomes aware of a noncompliance that may endanger health or the environment to provide oral notice to the EPA Regional Administrator or the State Director within 24 hours and written notice within five days.

- CWA Section 311, implemented by 40 C.F.R. Parts 110 (Discharge of Oil), 112 (Oil Pollution Prevention), and 117 (Determination of Reportable Quantities for Hazardous Substances). The Discharge of Oil regulation provides the framework for determining whether an oil discharge to inland and coastal waters or adjoining shorelines should be reported to the NRC, while the Oil Pollution Prevention regulation identifies discharges that also need to be reported to EPA. The Determination of Reportable Quantities for Hazardous Substances regulation requires the person in charge of a vessel or facility to immediately notify the appropriate federal agency of any reportable discharge of a designated hazardous substance.

- CAA Section 112(r)(1) imposes, as part of general duty to prevent accidental releases, a duty to minimize the consequences when they occur.

- CERCLA Section 103(a), implemented in 40 C.F.R. Section 302.8. This regulation requires a person in charge of a vessel or facility to immediately notify the NRC of any unpermitted release of a reportable quantity of a CERCLA hazardous substance.

In addition, the NCP and Stafford Act provide a means to help coordinate response efforts. The NCP addresses the role played by federal, state, and local agencies when a release of oil or

hazardous substances exceeds the ability of the facility to address it, as in the case of a natural disaster, and provides for the involvement of federal on-scene coordinators. The Stafford Act authorizes the delivery of technical, financial, logistical, and other assistance to states and localities during disasters or emergencies. It tasks FEMA with responsibility for coordinating government-wide relief efforts and the administration of disaster relief resources and assistance to states.

Local, state, and regional contingency plans under the NCP are meant to be designed in consultation with private interests to insure effective, efficient, and coordinated responses to minimize harm from oil discharges. It behooves members of the regulated community to participate in the plan development to make sure that their voice is heard.

C. After

The volume of statutes and regulations assessing liability for unauthorized releases puts that aspect of post-disaster law beyond the scope of this paper. This paper does, however, address a few exemptions that apply to otherwise sanctionable conduct and defenses to liability available to the regulated community.

1. Major Exemptions

a. Emergency and Public Health Exemptions

Many of pollution programs contain exemptions for otherwise prohibited acts during natural disasters. For example, CERCLA Section 104 authorizes the President to take actions consistent with the NCP to protect human health or welfare in response to releases of hazardous substances or other dangerous pollutants,[36] and a Superfund rule allows an On-Scene Coordinator ("**OSC**") to determine it necessary to transfer CERCLA waste during emergencies without following the usual procedures for planning and implementing off-site response actions.[37]

These exemptions are invoked when disasters hit. For instance, during the response to Hurricane Katrina, EPA used the CWA's emergency exemption authority to allow contaminated floodwater to be pumped into Lake Pontchartrain.[38]

b. National Security

Another exemption commonly found in pollution statutes involves national security. CAA Section 112 provides the President authority to exempt, for up to four years, any stationary source from compliance with hazardous air pollutant standards and limitations, if he or she determines the technology necessary to meet the standards unavailable, and an exemption is in the national security interests of the United States.[39]

Although the CAA's national security exemption has never been invoked, a trade group unsuccessfully urged President Obama to issue an executive order exempting the U.S. power industry from the Mercury and Air Toxics Standards rule, arguing that the rule's deadlines for

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[36] 42 U.S.C. § 42 U.S.C. § 9604 (a)(1).

[37] 40 C.F.R. § 300.440(a)(2); see also 42 U.S.C. § 9604(a). See also 40 CFR §264.1(g)(8) (imminent and substantial threat or an actual discharge of hazardous waste during an immediate response.

[38] Comments of the Section of Environment, Energy, and Resources of the American Bar Association Regarding Legislation Creating Exemptions to Environmental Laws and Regulations, Nov. 21, 2005, at 26.

[39] 42 U.S.C. § 7410(i)(4).

compliance could force some utilities out of business, and lead to power shortages at military bases.[40]

2. Major Defenses

a. Act of God Defense

The act of God defense is an affirmative defense to liability for releases caused by an extreme natural event present in pollution statutes, including the CWA, as amended by OPA,[41] and Superfund. For instance, Superfund defines "act of God" to mean "an unanticipated grave natural disaster or other natural phenomenon of an exceptional, inevitable, and irresistible character, the effects of which could not have been prevented or avoided by the exercise of due care or foresight."[42] Most natural disasters are, at some level, foreseeable; that a hurricane would hit Greater Houston is anticable, even if the massive volume of rainfall from Hurricane Harvey was unprecedented. Thus, the issue of foreseeability—present in other environmental defenses as well—has proved to be an insurmountable hurdle,[43] and there are no reported CERCLA cases where a PRP established the defense.[44]

b. Good Samaritan Defense

The Superfund's Good Samaritan defense appears in CERCLA Section 107(d). The defense is available to any person "rendering care, assistance, or advice" in accordance with the NCP or at the direction of an NCP-appointed OSC in response to an emergency created by another person's release of a hazardous substance.[45] It contains a carveback for damages caused by a private actor's negligence or a state or local government's gross negligence.[46]

The Good Samaritan defense became a topic of discussion in the wake of the Gold King Mine disaster, which released an estimated three million gallons of acid mine drainage wastewater into the tributary of the Animas River. The release was caused by EPA's decision to add pipes at a mine entrance plug backed by a tunnel filled with pressurized water, which burst out when excavation began.[47] Although most news coverage focused on castigations of EPA,[48] some analysts noted that the many inactive or abandoned hard rock mines in the United States present an environmental problem, and the carveback for negligence under Superfund, and the complete lack

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[40] Center for a New American Security, Coal Utilities Propose Clean-Air Exemption, Nov. 28, 2011, https://www.csas.org/press/in-the-news/coal-utilities-propose-clean-air-exemption.

[41] 33 U.S.C. 1321(a)(12)(definition: "Act of God" means an act occassionaed by an unanticipated grave natural disaster") and 1321(f)(defense).

[42] 42 U.S.C. § 9601(1). The statute also limits the defense to situations where the PRP made no contribution to the release or resulting damages. 42 U.S.C. § 9607(b).

[43] *See e.g., United States v. Alcan Aluminum Corp.*, 892 F. Supp. 648 (M.D. Pa. 1995) *aff'd*, 96 F.3d 1434 (3d Cir. 1996);*United States v. M/V Santa Clara I*, 887 F. Supp. 825 (D.S.C. 1995);*United States v. W.R. Grace & Co.*, 280 F. Supp. 2d 1135 (D. Mont. 2002), *aff'd sub nom*., 429 F.3d 1224 (9th Cir. 2005).

[44] In *In Re September 11 Litigation*, 751 F.3d 86, 94 (2d Cir. 2014), the Second Circuit held the act of war affirmative defense relieved World Trade Center owners and lessees and airlines of Superfund liability and analogized an act of War to a tornado. So perhaps the act of God defense is available for tornadoes.

[45] 42 U.S.C. § 9607(d).

[46] *Id*.

[47] U.S. Department of the Interior, Bureau of Reclamation, Technical Evaluation of the Gold King Mine Incident, San Juan County, Colorado at 1-3 (Oct. 2015), https://www.usbr.gov/docs/goldkingminereport.pdf.

[48] Paul Driessen, *EPA's gross negligence at Gold King*, NEW MEXICO POLITICS, Aug. 21, 2015, https://nmpolitics.net/index/2015/08/epas-gross-negligence-at-gold-king/.

of any Good Samaritan defense in the CWA, means that these pollution statutes present a major obstacle to voluntary remediation of such sites.[49] Although bills to expand the protections for Good Samaritans have been proposed,[50] none has passed thus far.

c. Response Action Contractor Defense

CERCLA section 119(a) contains a defense for response action contractors that shields them from liability for damages resulting from a release of hazardous substances.[51] Like the Good Samaritan defense, this defense has clawbacks for releases caused by the contractor's negligence, gross negligence or intentional misconduct.[52] The federal District Court of New Mexico recently addressed this defense in a case arising out of the Gold King Mine disaster. The court found that the plaintiff stated claims under CERCLA for liability of the contractor as a covered person or PRP (operator, arranger, transporter) because of its remediation activities.

In a motion to dismiss, two of the contractors hired by EPA asserted that the complaint failed to plead specific facts specifically showing that their negligence caused the release because, instead of making specific allegations as to each response action contractor on the site, the plaintiffs made general allegations about "the 'EPA crew,' 'EPA On site Team,' and 'Contractor Defendants[.]'"[53] The court rejected the argument, finding that the allegations referring to the negligence of the "EPA crew" or the "Contractor Defendants" gave the contractors fair notice of the plaintiffs' claims and the grounds on which they rested.[54]

d. Government Contractor Defense

Arising under the common law, the government contractor defense extends the protection of sovereign immunity to contractors hired by the government. To establish a displacement of state law, a government contractor must show:

- the case involves "uniquely federal interests";[55]
- a "significant conflict exists between an identifiable federal policy or interest and the operation of state law";[56] and
- the contractor's actions fall within the "scope of displacement."[57]

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49 U.S. Government Accountability Office, Abandoned Mines: Information on the Number of Hardrock Mines, Cost of Cleanup, and Value of Financial Assurances, Statement of Anu K. Mittal, GAO-11-834T, Jul. 14, 2011, https://www.gao.gov/assets/130/126667.pdf

50 Brian Clark Howard, *5 Other Mines at Risk of Spilling Toxic Waste*, NAT. GEO., Aug. 14, 2015, https://news.nationalgeographic.com/2015/08/150814-hardrock-mines-toxic-waste-pollution-colorado-mine-environment-gold-king-spill/.

51 42 U.S.C. § 9619(a)(1). The statute defines "response action contractors" to mean persons who enter a contract with a government or PRP to provide removal or other remedial action in connection with a release or threatened release of a hazardous substance, or pollutant or contaminant. 42 U.S.C. § 9619(e)(2).

52 42 U.S.C. § 9619(a)(2).

53 *In re Gold King Mine Release in San Juan Cty., Colo., on Aug. 5, 2015*, No. 1:18-MD-02824-WJ, 2019 WL 1282997, at *4 (D.N.M. Mar. 20, 2019).

54 *Id*. at *5.

55 *Boyle v. United Technologies Corp*., 487 U.S. 500, 504 (1988) (citing and quoting authority)

56 *Id*. at 507 (internal quotation marks omitted) (citing and quoting authority).

57 *Id*. at 512.

Furthermore, to come within the scope of that displacement, the contractor must show:

- "the United States approved reasonably precise specifications";[58]
- the contractor "conformed to those specifications";[59] and
- the contractor "warned the United States about the dangers known to the contractor but not to the United States."[60]

As can be seen in the district court's denial of the motion filed by the government contractors involved in the Gold King Mine disaster, the defense is near-impossible to make out at the pleading stage, because few complaints are going to contain allegations showing the reasonable precision of an agency's specifications, the contractor's conforming performance, or dangers known to the contractor, but not the agency.[61] To the contrary, most complaints will allege negligence or worse on the part of the contractor. Thus, nearly all defendants will have to, at minimum, bear the cost of discovery before their government contractor defense becomes viable.

3. Potential Additional Exemptions of Defenses

In November 2005, the American Bar Association's Section of Environment, Energy, and Resources ("**SEER**") issued a study evaluating various expansions of the exemptions and defenses for emergency situations proposed in the aftermath of Hurricanes Katrina and Rita.[62] Examples of the proposed legislation include:

- a bill introduced by Senator James Inhofe, which would allow the EPA Administrator to waive or modify the application of any EPA-administered law, for up to 240 days, if he or she determines it necessary for a timely and efficient response to Hurricane Katrina and in the public interest.[63]
- bills introduced by Senator Mary Landrieu and Senator David Vitter, respectively, that would authorize the President to issue emergency permits for any project carried out in response to Hurricane Katrina.[64]
- bills passed by the House of Representatives that would amend the CAA to: (1) extend compliance deadlines for the ozone air quality standard in some areas; (2) codify regulations exempting large equipment replacement projects from new source review; (3) codify the hourly emissions rate test for emission increase determinations; (4) extend ozone attainment deadlines for areas impacted by downwind sources; (5) make the Department of Energy the lead

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58 *Id*.
59 *Id*.
60 *Id*.
61 *In re Gold King Mine Release in San Juan Cty., Colorado, on Aug. 5, 2015*, 2019 WL 1282997, at *5.
62 *See generally* Comments of the Section of Environment, Energy, and Resources of the American Bar Association Regarding Legislation Creating Exemptions to Environmental Laws and Regulations, Nov. 21, 2005.
63 *Id*. at 4.
64 *Id*.

> agency for new refinery environmental permits; and (6) require all challenges to new refinery permits to be heard in the D.C. Circuit.[65]

Noting its inability to find a single example of federal environmental law thwarting disaster response efforts and the dangers of blanket exemptions,[66] SEER opposed "legislation that authorizes or creates broad exemptions, suspensions, or waivers of federal or state environmental laws."[67]

Hot Issues

I. Climate Change

As climate change increases the frequency and severity of hurricanes and other storms, the potential for accidental releases and corresponding regulatory and common law claims also increases. Environmental activists have long pushed to make climate change a litigation centerpiece, and have been creative in their claims. Among the approaches they have taken is to sue energy companies for a failure to adapt to the effects of climate change.

After Hurricane Irma, a federal district court judge in Massachusetts allowed the Conservation Law Foundation (CLF) to bring statutory claims under the citizen suit provisions of the federal Clean Water Act (CWA) and Resource and Recovery Act (RCRA) against ExxonMobil for failing to protect its Everett, MA terminal from the impacts of climate change.[68] Plaintiff claims that ExxonMobil has contributed to an imminent and substantial endangerment in violation of RCRA [sic] and has breached its CWA discharge permit conditions in violation of the Clean Water Act. The judge disallowed claims relating to the distant future, but refused to dismiss claims on impacts that already have occurred or that are imminent or likely in the nearer future. The court rejected ExxonMobil's argument that its permit did not require climate change to be taken into account in its engineering, noting that the permit required ExxonMobil to "consider possible severe weather events, which would include those caused by climate change."[69] CLG brought a similar claim against Shell, alleging it had failed to protect the Providence River and Rhode Island communities near its terminal from the impacts of climate change.[70]

II. PFAS

PFAS are a family of more than 3,000 fluorinated alkyl chemicals produced from the mid-1900s to the turn of this century. Their properties make them useful as oil and water repellants and fire suppressants. Although medical opinion is mixed with regard to risks to human health and the environment from PFAS, these chemicals are of concern because they are ubiquitous, highly mobile, persistent, and bioaccumulative.

Class actions against PFAS manufacturers have been filed in multiple states, and the Judicial Panel on Multidistrict Litigation recently ordered a consolidation of 75 lawsuits involving groundwater

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[65] *Id*. at 5.
[66] *Id*. at 4, 9-11.
[67] *Id*. at 11.
[68] *Conservation Law Foundation, Inc. v. ExxonMobil Corporation*, 1:16-cv-11950 (D. Mass.).
[69] *Id*.
[70] *CLF v. Shell Oil Products US*, No. 1:17-CV-00396 (D. R.I.).

contamination from firefighting foams in the District of South Carolina.[71] The outcomes of two early cases show the stakes of such litigation: 3M settled a groundwater pollution lawsuit with the State of Minnesota for $850 million in February 2018; DuPont and Chemours agreed to a settlement of $671 million for pollution from its Washington Works manufacturing plant in West Virginia in February 2017.[72] Furthermore, in October 2016, Kevin Hardwick, an Ohio firefighter, filed a class action suit against PFAS manufacturers seeking relief "on behalf of a nationwide class of everyone in the United States who has a detectable level of PFAS chemicals in their blood"—a class encompassing 99% of the country.[73]

Users of PFAS-containing products, including refiners, chemical manufacturers, and businesses that make use of PFAS-based firefighting foam are at risk of being targets as well. Although the next wave of litigation has not yet rolled in, it is about to. For example, the U.S. Air Force, which made heavy use of PFAS-containing firefighting foams during training and emergencies since the 1970s, was recently sued by New Mexico's Environment Department over PFAS contamination near two of its bases,[74] and it has been issued multiple violations and compliance requests by the Michigan Department of Environmental Quality.[75]

A prudent company should keep up to date on regulatory and common law developments, while identifying risks posed by its historic or present PFAS use. Building on that background knowledge, it should develop PFAS-specific risk management strategies, including restricting PFAS use in its operations or in mutual assistance programs, obtaining insurance policies that will cover losses from PFAS use or entering agreements with its business partners that contractually assign PFAS liabilities, or pushing the trade associations to which it belongs to petition for legislation or rulemaking creating exemptions for certain PFAS uses, such as in firefighting foams.

Conclusion and Recommendations

As noted, the task of environmental compliance and risk management is particularly daunting when a natural disaster strikes. Environmental regulatory programs contemplate the occurrences of natural (and other) disasters and their potential impacts on a company's operations. Identifying and assuring compliance with those requirements up front is critical to reduce potential legal, as well as environmental and health, risks. But a prudent company will do more.

There are several lessons to be learned from Arkema. The company maintained that it acted prudently, but the plans it made and the measures it implemented proved inadequate in the face of an unprecedented storm. The result was unauthorized releases and potential harm to people and the environment, and legal exposure—to administrative, civil, and criminal enforcement as well as common law claims. With the potential for natural disasters to increase in frequency and magnitude as a result of climate change, assuring adequate preparation becomes more and more critical.

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[71] Aaron Leibowitz, *3M Fire Suppressant MDL Will Be Heard In South Carolina*, LAW360, Dec. 11, 2018, https://www.law360.com/articles/1109934/3m-fire-suppressant-mdl-will-be-heard-in-south-carolina.

[72] Brett Walton, *As PFAS Lawsuits Proliferate, Legal Tactics Emerge*, CIRCLE OF BLUE, Dec. 14, 2018, https://www.circleofblue.org/2018/world/as-pfas-lawsuits-proliferate-legal-tactics-emerge/.

[73] Sharon Lerner, *Nationwide Class Action Lawsuit Targets Dupont, Chemours, 3M, and Other Makers of PFAS Chemicals*, THE INTERCEPT, Oct. 6, 2018, https://theintercept.com/2018/10/06/dupont-pfas-chemicals-lawsuit/; Michael Phillis, *3M, Others Rip PFAS Suit Seeking To Represent 99% Of US*, LAW360, Feb. 15, 2019, https://www.law360.com/articles/1129748/3m-others-rip-pfas-suit-seeking-to-represent-99-of-us.

[74] Kyle Bagenstose and Jenny Wagner, *States, Military Clash on Cleanup of Toxic Chemicals*, ASSOCIATED PRESS, Apr. 6, 2019, https://www.apnews.com/e1ea9b09c6eb486b999c2318a8093669.

[75] *Id*.

Companies should identify all pertinent regulatory requirements (i.e., those arising from statute, rule, permit, order, and ordinance) and then make sure that: (1) all planning and associated recordkeeping and routine reporting requirements are satisfied; (2) all required plans and procedures have been developed and are current; and (3) all personnel are aware of their particular responsibilities under those plans. They should also ensure that, for any given release, it is clear who is to give the notice, when, to whom, and how.

A prudent company will take additional steps to maintain compliance under the worst of conditions, focusing particularly on requirements pertaining to accident releases. For instance, it may wish to retain an environmental consultant to perform a peer review of this identification and planning activity. Such reviews not only help assure compliance, but also assist in identifying otherwise unanticipated situations, perhaps by conducting a fault tree analysis or looking at the issues facing a facility top down rather than the bottom up.

The company will also put in place a plan that identifies personnel with responsibility to take charge during a disaster—as well as their backups—and that spells out the steps that each member of the disaster-response team is to take before, during, and after a natural disaster strikes. Of course, plans are of little value if they are not properly implemented, so disaster-response training is critical. Moreover, as few companies can deal with a natural disaster on their own, a prudent company will consider strengthening local ties long before a disaster looms to assure that first responders and the surrounding community has pertinent information to guide their disaster responses.

Once word of a potential natural disaster breaks, the company should immediately begin taking preliminary steps. In the case of Arkema, perhaps the peroxide should have been removed and taken to a more secure location when the storm was still well out to sea. Once the hurricane became more imminent, potential options became more limited.

There is no silver bullet for addressing natural disasters, but having a rigorous program of environmental compliance and risk management, and focusing on and attempting to predict the consequences of a natural disaster, will help minimize legal as well as environmental and human health risks