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Environmental Disasters and Human Health Consequences: A Year in Review

*By Susan Johnson, Blythe Brauer, Samantha Bird, Andrea Abergel, Jon Davey, and Mary Strayhorne**

Introduction

Several domestic and international environmental disasters yielded widespread adverse environmental health consequences in the past year. The following article examines the causes, effects, and legal and political implications of four recent major industrial catastrophes. First, the article reviews a deadly industrial explosion resulting from improper chemical storage in rural Texas in April 2013. Next, we move across the globe to a collapse of a textile factory in Bangladesh that occurred just one week later, highlighting some of the adverse consequences to globalization without proper government oversight. The article then focuses on three events that raise public health concerns as they relate to drinking water. First, we focus on the widespread contamination of a public drinking water source in North Carolina by a major energy producer. Next, we review the ongoing struggle to resolve the harmful implications of the West Virginia chemical spill. Lastly, we explore the increasing environmental and health effects of natural gas exploration and hydraulic fracturing.

These cases demonstrate the direct impact that industrial carelessness often has on human health and underscore the importance of natural resource preservation and protection. More than 1,000 people were killed and countless injured as a result of these tragedies. While the long term effects remain to be seen, the events of the last year demonstrate the increasing need for environmental responsibility not only to preserve the environment for its own sake but also to maintain and improve public health.

Disastrous Explosion at Texas Chemical Plant

At 7:30 pm on April 17, 2013, a fire broke out at the West Chemical and Fertilizer Company plant in West, Texas, a town of roughly 2,800 people located 75 miles south of Dallas. After local firefighters arrived on the scene shortly before 8:00 pm, the plant exploded.[1] The explosion flattened all the buildings within a five-block radius, including a nursing home and an intermediate school.[2] The blast was so intense that the U.S. Geological Survey registered it as a 2.1 magnitude earthquake.[3] Over 200 people were injured and 15 were killed, most of whom were first responders from the local fire department.[4]

The company that owned the plant, Adair Grains Inc., used it to store chemicals and fertilizer for sale to farmers. The facility stored substantial amounts of potentially explosive chemicals, including ammonium nitrate.[5] According to the Environmental Protection Agency ("EPA"), Adair Grains was in possession of 540,000 pounds of ammonium nitrate.[6] Investigators from the Texas Department of Insurance and the state Fire Marshall's Office concluded that the ammonium nitrate caused the explosion due to its high flammability.[7] While the source of ignition is unknown, anything from a faulty golf cart to an electrical malfunction could easily have set the ammonium nitrate on fire.[8]

> *"It would take OSHA ninety years to inspect each similarly situated facility in Texas alone."*

Ammonium nitrate is so volatile that businesses with supplies of the chemical are stringently monitored. At the time of the explosion, seven state and federal agencies were monitoring the West plant;[9] however, inspectors had not visited the plant since 2011, when it was found in violation of safety protocol.[10] The Chairman of the U.S. Chemical Safety Board, testifying in front of the U.S. Senate Environment and Public Works Committee, conceded that the West plant was lost in the "patchwork of U.S. safety standards and guidance."[11]

In 2011, the U.S. Pipeline and Hazardous Materials Safety Administration fined Adair Grains $5,250 for not having a security plan in place at the West plant.[12] In 2006, EPA responded to a citizen's complaint about an ammonia smell emanating from the plant.[13] They referred the situation to the Texas Commission on Environmental Quality ("TCEQ"). It took TCEQ eleven days to respond, despite the fact that ammonia smell, particularly from a fertilizer plant, is considered high priority.[14] TCEQ ended up fining the company $2,300 for failing to secure an air permit authorization for their ammonium nitrate tanks.[15] TCEQ would normally be obligated to disclose these violations to the U.S. Occupational Safety and Health Administration ("OSHA"), but it failed to do so because Adair assured the agency there was no chance of an explosion even in "the worst case scenario."[16] OSHA had not inspected the plant since 1985.[17]

Agencies overseeing facilities like the West plant are stretched very thin. It would take OSHA ninety years to inspect each similarly situated facility in Texas alone.[18] As a result, the

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government relies on businesses to follow the law and take the proper precautions to avoid disaster. Adair Grains had "ample opportunity to know and follow the law" and knew the potential consequences for failure to take the proper safety precautions.[19] A post-explosion inspection by OSHA cited twenty-four violations at the facility and proposed $118,300 in fines for "exposing workers to fire and explosion hazards of ammonium nitrate and chemical burns and inhalation hazards from ammonia storage and servicing" as well as "unsafe handling of ammonium nitrate" and "failing to have an emergency response plan and appropriate fire extinguishers."[20]

The U.S. Department of Homeland Security ("DHS") requires businesses to disclose information on large-scale explosive chemical storage.[21] Though Adair Grains stored 1,350 times the amount of ammonium nitrate that should trigger DHS oversight, it did not disclose information to DHS.[22] The company operated "willfully off the grid," and DHS did not even know the plant existed until after the explosion occurred.[23]

Several insurance companies brought the first lawsuit against Adair Grains on behalf of individuals and businesses in West that suffered injury and property damage just three days after the explosion.[24] The suit claimed the company was negligent in the operation of its facility by "creating an unreasonably dangerous condition which led to the fire and explosion."[25] Between April and August 2013, thirteen other lawsuits were filed against Adair Grains in the three district courts of the county.[26]

In June 2013 the city of West filed suit against Adair Grains and CF Industries, the chemical company that supplied the plant with two 100-ton shipments of ammonium nitrate weeks before the explosion.[27] Many of the other plaintiffs proceeded to amend their suits and added CF Industries as a defendant. The suits allege that CF Industries produces a safer product than ammonium nitrate and is therefore aware of its dangers.[28] The city is seeking $17 million for negligence and product liability.[29] Environmental law attorneys have expressed doubt that the plaintiffs will prevail in the cases against CF Industries because ammonium nitrate is used extensively throughout the country in everything from fertilizer to first-aid icepacks.[30] To argue that a particular product is somehow defective to succeed with a products liability claim will therefore be extremely difficult.[31]

In October 2013, the 170th State District Court in Waco, Texas, appointed a nine-member steering committee comprised of plaintiffs' and defendants' lawyers to decide how to proceed with the complex, multi-party litigation. The plaintiffs were split into three groups: those who lost relatives, those who suffered injuries, and those who suffered property damage.[32] The case is currently in the discovery phase, and attorneys estimate there may be millions of documents to examine. The first trial date is set for January 26, 2015, the others for later that year.[33]

Even if the plaintiffs are able to recover damages from Adair Grains and CF Industries, it is unlikely this one incident will be sufficient warning for other corporations to make costly adjustments to improve their chemical storage practices. Congress has recognized that the security of these facilities cannot be left to "chance or the good intentions of only the most responsible companies."[34] The Department of Homeland Security has already made plans to expedite the approval of security plans for thousands of chemical plants that have been backlogged for years. It is imperative that all of the federal and state agencies that regulate these corporations coordinate to streamline the inspection process and ensure no facility is overlooked.

The Collapse Heard around the World: *Why Negligent Officials in Bangladesh and Big Fashion Houses Are Contributing to Environmental Disasters and Death*

On April 24, 2013, an eight story commercial building named Rana Plaza collapsed in Savar, a sub-district of the capital of Bangladesh.[35] Over eleven hundred people died in the collapse and over twenty-five hundred were injured.[36] Over 48 hours after the building's collapse, garment workers were still pinned beneath tons of mangled metal and concrete. Rescue crews struggled to save them, as desperate relatives clashed with police. This event is considered the deadliest garment factory accident and structural failure in history.[37] The building, composed of separate garment factories employing about 5,000 people, also contained apartments, a bank, and several other shops, some of which immediately closed after inspectors discovered cracks in the building the day before the collapse.[38] Despite warnings, managers ordered garment workers to return the day following the discovery of the cracks,[39] threatening to withhold a month's pay otherwise.

The lead architect of the building claims it was never meant for factory-type production and work.[40] Officials nonetheless renewed licenses for the factories. While the number of factories in Bangladesh has soared in recent years to over 240,000, there are only 50 government inspectors who issue operating licenses and monitor their safety.[41] There are 3,500 licensed garment factories that employ more than 3 million workers, mostly women from impoverished villages, who are paid as little as $30 per month and endure unsafe working conditions.[42]

A top Labor Ministry official claims that Bangladeshi authorities were negligent for allowing garment factories to operate in such buildings and for allowing the few city officials who issue licenses to do so without performing proper safety checks.[43] He further contends that Bangladeshi officials should have been acting to ensure their buildings met international labor standards. Some counter that the negligence extends beyond Bangladesh and that international companies who purchase low cost clothing from such factories should share some of the blame for the dismal working conditions factory workers face.[44]

Such companies using factories in Bangladesh to produce their goods include retail clothing companies like the United Colors of Benetton, the Children's Place, Mango, and Walmart.[45] Bangladeshi officials submitted a plan after the collapse that would establish an independent inspectorate to oversee all their factories funded by contributions from the clothing companies, but many companies rejected the proposal due to cost and legal risk.[46] While rejecting the proposal, Walmart stated it would monitor the 279 factories it uses in Bangladesh and report the

results on their website.[47] Walmart and other American companies promised to stop production if urgent safety problems were uncovered, and factory owners and government authorities were notified of the proposed improvements. Carrefour, Benetton, Marks & Spencer, El Corte Inglés, H&M, and Inditex signed on to the safety agreement.[48] In addition to inspections, the plan will help pay for safety upgrades.

The Bangladesh labor market remains relatively unstable, however. With the new agreements in place, the conditions may improve and injured workers may find relief but not to the extent that most human rights activists demand, which include legally binding contracts between Bangladesh and international companies that use their factories. Absent the legally binding contracts with international companies, Bangladeshi officials will remain alone in bearing legal responsibility for the wrongful deaths arising from apparent negligence and greed. Bangladesh responded to suits alleging negligence and wrongful death by suspending seven inspectors accused of renewing the licenses of garment factories in the building that collapsed and ordering the arrest of the owner of the nine-storied commercial building.[49]

"Absent the legally binding contracts with international companies, Bangladeshi officials will remain alone in bearing legal responsibility for the wrongful deaths arising from apparent negligence and greed."

The magnitude of human loss associated with building collapses is considerable, largely due to the inadequacies of lax structural requirements and management agencies in Bangladesh and other developing countries. The quality of the environment, both natural and man-made, depends on its management, control and organization and therefore stricter environmental standards are imperative. One of the aims of environmental management moving forward should be to reduce or completely eliminate the vulnerability of the environment to such disasters through prevention, mitigation, preparedness, and capacity building to prevent future man-made building collapses. The Bangladeshi government should strive to review and tighten policy guidelines to make Bangladesh a safer environment for living and working.

Catastrophe in North Carolina: What is in the Future for Coal Ash Waste?

In early 2014, North Carolina experienced the third largest coal ash spill in U.S. history. It began on February 2, when a Duke Energy ("Duke") security guard noticed an unusually low coal ash pond.[50] A subsequent investigation revealed that a pipe at the bottom of the twenty-seven acre pond was spewing 50,000 to 82,000 tons of coal ash and 27 million gallons of contaminated water into the Dan River, which serves as a drinking water source for several Virginia municipalities.[51]

The North Carolina Department of Environment and Natural Resources ("DENR") initially determined that the ash dam basin remained intact despite the leak, with most of the ash contained in the pond.[52] DENR worked with Duke Energy officials and the U.S. EPA to control the spill and ascertain the leak's potential effects on human health. Authorities inserted a plug to stop the flow of coal ash, which they subsequently had to replace after it leaked an additional 1,000 gallons of wastewater into the river.[53] Officials in affected areas such as Virginia Beach, Virginia, shut off water supply originating with the contaminated waters and relied instead on local resources.[54]

Federal prosecutors began a criminal investigation within a week of the incident and shortly thereafter issued subpoenas to DENR and Duke.[55] Legal issues surrounding Duke's handling of coal ash first arose in 2013 when it became the subject of multiple unrelated federal suits under the Clean Water Act.[56] DENR effectively halted those suits aimed at forcing Duke to clean up its coal ash locations[57] and instead undertook enforcement of the sites' cleanup, asserting minimal penalties against the company and setting a low bar for future state penalty assessments. Minimal regulation of the coal ash pond allowed Duke to continue its irresponsible storage practice—overloading its coal ash sites and thereby increasing the risk of drinking water contamination. At a press conference a week after the spill was made public, Governor Pat McCory, a former Duke employee with stock in the company, denied influencing DENR's intervention or having any communication with the company regarding its legal obligations.[58]

The third of the unrelated 2013 federal suits was pending at the time of the incident in February 2014. In response, DENR asked the state judge to stay the federal settlement while the state conducted an investigation of the coal ash facilities in the state, demonstrating active steps to correct the regulatory mishaps of the prior year.[59] Investigators hoped to reveal how often regulators inspected the coal ash sites, the extent of subsequent enforcement actions, the identity of the key players, and whether the relationship between DENR and Duke required more settlements for criminal violations.[60]

Looking forward, some coal combustion products companies have suggested amending the regulatory authority EPA has over hazardous materials to include coal ash as a waste regulated under the Resource Conservation and Recovery Act ("RCRA").[61] Additionally, there has been pressure on the

Obama administration to start policing waste storage sites across the nation.[62] Currently, the federal government empowers the states to regulate the waste sites, which results in inconsistent regulation.[63] EPA has set a December 14, 2014 deadline to release a draft of regulatory revisions to RCRA to upgrade coal ash disposal under Subtitle D as a non-hazardous waste.[64] To complement the regulatory action, Congress is considering amending RCRA to require states to enforce the federal non-hazardous waste standards.[65]

Criminal investigations related to the Duke site are still underway after twenty subpoenas were sent to DENR.[66] The state agency has hired its own attorney to investigate Duke's practices, and reported at least eight subsequent violations since the February spill.[67] As the criminal proceedings continue, the public seeks answers and accountability. Voters blame Duke and the state government for not doing enough to protect natural resources from toxic chemicals.[68] A poll of North Carolinians revealed that Democrats, Republicans, and Independents all agree on the need for leaders who are willing to stand up to big oil companies.[69] More importantly, North Carolinians voiced their concerns about regulating coal ash as a hazardous substance and expressed a desire to move power plants away from rivers and lakes to specifically designed landfills for environmental safety.[70]

"A poll of North Carolinians revealed that Democrats, Republicans, and Independents all agree on the need for leaders who are willing to stand up to big oil companies."

Questions Remain Over West Virginia Chemical Spill

On January 9, 2014, approximately ten thousand gallons of 4-methylcyclohexane methanol ("MCHM") and polyglycol ethers ("PPH") spilled from a Freedom Industries container into West Virginia's Elk River.[71] Approximately 300,000 people in nine counties immediately lost access to running water.[72] Though the government predicts no long-term health effects from the exposure,[73] at least 400 people sought medical treatment for nausea, vomiting, burning eyes, and rashes following the spill.[74] Months later, many Charleston-area residents were still relying on bottled water and question the extent to which Freedom Industries will be held accountable as the polluter. After this event, similar questions linger over future spill prevention and industrial chemical testing requirements.

The leak occurred one and a half miles from Charleston's drinking water intake and treatment facility.[75] Freedom Industries employees did not notice the spill until after residents complained of a licorice smell the day of the spill. Initial mitigation efforts failed[76] and MCHM subsequently overwhelmed the water treatment facility's filters, prompting a do-not-use order.[77] Officials lifted the ban on water use in most communities after nine days but reinstituted it in some places on January 30.[78] Three months after the spill, many residents continued to use bottled water whenever possible, noting lingering licorice-type odors.[79]

Government officials know little about MCHM's environmental or health hazards, as federal chemical safety law is largely a morass. The Toxic Substances Control Act ("TSCA")[80] is the federal statute that primarily governs chemical safety,[81] but it exempts MCHM and roughly 64,000 other chemicals from safety testing.[82]

Because TSCA permits MCHM use and transport in industrial capacities without significant testing, industry and government officials as well as the general public were left without a modicum of information on how to address the cleanup.[83] Under TSCA, the EPA cannot test MCHM to determine its risk to health or the environment, unless the agency shows the chemical poses an unreasonable risk.[84] Such circular reasoning significantly impedes thorough testing. Further, EPA does not oversee aboveground storage tanks like those at issue in this spill,[85] and because the U.S. Department of Transportation does not regulate the transportation of MCHM, emergency response teams do not consider MCHM hazardous.[86] While the spill reinvigorated a stalled Senate proposal to update TSCA,[87] environmental groups are largely opposed to the proposed measure because it does not go far enough to protect the public's health.[88]

Regardless of whether and to what extent Congress acts, courts will play a key role in assuaging the spill's effects as many people adversely impacted by the spill will want recompense for the damage Freedom Industries caused. But Freedom Industries filed for bankruptcy on January 17, 2014, stymying attempts to sue the company.[89] While prosecutors are investigating their options,[90] it remains unclear how long it will take and to what extent it may lead to criminal prosecution.

The spill's aftermath illustrates why significant policy changes regarding chemical safety are so hard to come by: the great chasm between local and federal chemical regulatory regimes, Congressional inability or unwillingness to act, and a slow moving judicial process do not immediately provide for clean water or safer MCHM and related chemical storage practices.

Latest Legal Developments in Natural Gas Exploration Affecting Human Health

The current worldwide energy crisis and resulting eleventh hour rush to find viable alternative energy sources have triggered the hasty implementation of natural gas technologies with effects that have yet to be willingly revealed by natural gas and oil companies. At present, the federal government is slow to move on implementing federal regulations on hydraulic fracturing as a method for natural gas exploration and extraction. Additionally, states and local governments have been at odds on whether to allow fracking activities within their boundaries, leaving many local governments in forced submission to state political agendas. The legal landscape in state and federal courts portrays a canvas of nuisance and trespass claims with a monolith of personal injury claims surfacing on the horizon. Several events over the course of 2013 shaped the legal landscape around natural gas exploration and human health in the United States, which saw an array of new regulatory schemes and litigation strategies by big business oil and gas companies.

Contemporary natural gas exploration employs the hydraulic fracturing method, or "fracking,"[91] an old mining method employed with a new purpose which has been exhaustively analogized to the famous 19th century American Gold Rush in the west, where gold-seekers used hydraulic mining to separate gold dust from detritus along California and Alaskan-Canadian landscapes.[92] Times have changed, but the big business approach has not.

The pursuit for the "new black gold" has barreled on with little federal oversight, rising conflict between state and local governments, and litigation settlement strategies by oil and gas companies with strange and potentially sinister outcomes. The federal government has been slow to respond to a need for regulatory controls of fracking activities leaving some states tangled in an on-going preemption battle with local municipalities within their jurisdictions.[93] Conflicting court opinions and state policies on energy exploration have frustrated local community efforts to control fracking activity through zoning ordinances, who must then submit themselves to oil and gas exploration with no power to regulate.[94]

The past year saw some states taking a proactive posture with the emergence of water contamination issues related to fracking operations. For instance, California and Illinois both passed legislation to regulate fracking, both consisting of disclosure and public notification requirements related to chemicals used in their fracking operations.[95] Although both states successfully passed disclosure requirement laws, the Illinois Department of Natural Resources faced criticism by environmental advocates for drafting regulations that fell short of the legislature's statutory intent by undermining the effect of the disclosure and flow-back water requirements.[96] Meanwhile, a Wyoming 2011 study on fracking and its effects on drinking water contamination led the U.S. EPA to admit—after discontinuing its own study in deference to the Wyoming efforts—that fracking does "likely impact" groundwater.[97]

"EPA does not oversee aboveground storage tanks like those at issue in this spill, and because the U.S. Department of Transportation does not regulate the transportation of MCHM, emergency response teams do not consider MCHM hazardous."

Litigation and settlements related to fracking activities have typically concluded with settlements or sudden dismissals by Plaintiffs when water contamination by harmful substances related to fracking activities, a conspicuous aspect at claim initiation, becomes a nonissue.[98] Truths appear to be suppressed in the interest of instant justice through an age-old preemptive litigation strategy, the conditional settlement. As a result, most fracking-related complaints remain within the realm of common law nuisance and trespass theories, but some complainants have filed personal injury claims alleging harms caused by water contamination by fracking-related harmful chemical bi-products.[99]

Many lawsuits originate with landowners claiming groundwater contamination caused by oil and gas and drilling companies' operations near the landowner's homes, many of which are concentrated in states like Arkansas, Colorado, Louisiana, Ohio, New York, Pennsylvania, Texas, and West Virginia.[100] In 2013, Ohio and Pennsylvania district court decisions held that the facts and circumstances of two cases supported claims for negligence liability in fracking.[101] Ohio, the stage for recent controversy referred to as "Frackgate," has recently been the venue to Clean Water Act enforcement where a former Youngstowne-based wastewater company owner was charged under the Act's criminal provision for dumping and ordering another employee to dump deep injection mud and brine into a sewer that feeds into the Mahoning River watershed.[102] Plaintiff litigation strategies seem to be shifting gears toward establishing fracking as an "abnormally dangerous activity," which if established would trigger strict liability for negligence in some jurisdictions.[103] Fracking litigation has even implicated the Exxon-Mobil Corporate Executive Officer, Rex Tillerson, who joined a lawsuit with his

neighbors to prevent fracking near his home based on a nuisance theory that fracking would cause a drop in property values.[104]

In light of the recent increase in fracking activity, slow federal regulatory momentum, state and local conflicts, limited environmental impact studies, and litigation still in the early stages, it will likely be a few years before the public will realize the full impact of fracking activities on human health and the environment. The trend of quick settlements by oil, gas, and drilling companies is another element that will slow the illumination of the full picture of fracking effects on human health.

Endnotes: Environmental Disasters and Human Health Consequences: A Year in Review

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