

# Something Smells: Hog Farming Waste Management in North Carolina

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## I. Introduction

Over the past three decades, the agricultural industry in the United States has witnessed dramatic shifts in structure and production methods. The notions of small time, local producers have given way to mass scale production in the hands of a few large agribusinesses. Aside from economic hardships for small farmers, this industry shift has directly exacerbated the increase in pollution to the waters of the nation.

Three major factors of this industry shift have promoted rampant pollution. The first is that the consolidation of the agriculture industry into fewer corporate entities has allowed for the vertical integration of the production process.<sup>1</sup> This means that one corporation could have complete control from the time an animal is born to the moment that its meat is transported to a grocery store. Inherently, this allows for less regulation and oversight of potential pollution sources. Second, is the emergence of CAFOs (concentrated animal feeding operations).<sup>2</sup> A CAFO is a facility which confines large numbers of animals in a very small space and is categorized as such if it meets a threshold number of a specific animal set forth by the EPA.<sup>3</sup> The sheer quantity of animals, sometimes numbering in the millions, produces incredible amounts of waste that is at high risk of diffusing into the surrounding environment. Finally, large agribusiness has been successful in lobbying for agricultural subsidies that support mass planting

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<sup>1</sup> Dutzik, Tony et al., *Corporate Agribusiness and America's Waterways: The Role of America's Biggest Agribusiness Companies in the Pollution of our Rivers, Lakes and Coastal Waters*, ENV'T AM. RESEARCH & POLICY CTR. (November 2010).

<sup>2</sup> *Id.* at 5.

<sup>3</sup> EPA- *Regulatory Definitions of Large CAFO, Medium CAFO, and Small CAFO* (2015)  
[http://www3.epa.gov/npdes/pubs/sector\\_table.pdf](http://www3.epa.gov/npdes/pubs/sector_table.pdf).

of chemical intense corn for ethanol production and animal feed.<sup>4</sup> This directly increases the risk of pollution from fertilizer and chemical in downstream runoff.

While the environmental risks posed by large agribusiness are too expansive to enumerate here, the impact of manure and waste management practices is an area that deserves serious attention. Manure is highly nutrient rich; in fact swine manure contains all 13 essential nutrients used by plants.<sup>5</sup> When the most crucial nutrients such as nitrogen and phosphorous are released into bodies of water they contribute to major algae blooms. The algae in turn causes the levels of dissolved oxygen in the water to plummet and fish and other aquatic level can no longer survive.<sup>6</sup> Aside from the detriment to marine life, release of nitrates into groundwater is a public health concern. Nitrates, unsafe for human consumption in quantities greater than 10 mg/L, have been implicated in disruption of thyroid function, bladder cancer, and methemoglobinemia.<sup>7</sup> The later, also known as blue baby syndrome, is a disease where nitrates in water given to a baby will alter one of its blood proteins and could ultimately lead to a slow suffocation.<sup>8</sup> Another large impact of manure runoff and pollution may seem intuitive yet worth mentioning; it has a pervasive and foul odor. Manure particles can easily be picked up by the wind and blown into nearby residential communities. The risks of pollution are exponentially exacerbated when manure is concentrated in waste containment apparatuses at huge animal feeding centers. Hog farming in North Carolina is a prime example of how the merging and consolidation of an industry has directly threatened the environment, public health, and the constitutionally guaranteed protection of the state's lands and waters.

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<sup>4</sup> Dutzik at 5.

<sup>5</sup> Chastain, John P. et al., *Swine Manure Production and Nutrient Content* (January 2003) [https://www.clemson.edu/extension/livestock/camm/camm\\_files/swine/sch3a\\_03.pdf](https://www.clemson.edu/extension/livestock/camm/camm_files/swine/sch3a_03.pdf).

<sup>6</sup> Dutzik at 6.

<sup>7</sup> EPA- *Basic Information About Nitrates in Drinking Water* (February 5, 2014) <http://water.epa.gov/drink/contaminants/basicinformation/nitrate.cfm>.

<sup>8</sup> World Health Organization- *Water Related Diseases* 2015 [http://www.who.int/water\\_sanitation\\_health/diseases/en/](http://www.who.int/water_sanitation_health/diseases/en/).

## II. Background

If water pollution from manure runoff has the potential for such large scale environmental and public health concerns, it would logically follow that legislatures and regulatory industries should be interested in controlling it. However, this has not proved to be the case to the extent that one would imagine. The Clean Water Act (CWA) of 1972 was the first major federal effort to address water pollution.<sup>9</sup> The CWA is administered by the Environmental Protection Agency (EPA) and in conjunction with state governments. It created the National Pollution Discharge Elimination System (NPDES) Program in order to “protect and improve water quality by regulating point source discharges”.<sup>10</sup> Point source pollution is “any single identifiable source of pollution from which pollutants are discharged, such as a pipe, ditch, ship or factory smokestack.”<sup>11</sup> Under the NPDES program, point source dischargers are required to obtain permits through state agencies.<sup>12</sup> The permits are issued once the facility can show that they are utilizing the best available technology in order to reduce pollutants in their discharge, and they prove that they will meet the required water quality standards.<sup>13</sup>

However, agriculture has, for the most part, been exempt from regulation under the CWA. Only CAFOs are considered to be point source dischargers, and even with this classification there has been major resistance to NPDES permitting. Two significant court rulings in the past decade have validated agribusiness’ fight against the permitting requirements. In 2005, the Second Circuit Court of Appeals in *Waterkeeper Alliance et al. v. EPA* held that the EPA can require NPDES permits only where there is an actual discharge event by a CAFO, not

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<sup>9</sup> EPA- *The Clean Water Act: Protecting and Restoring Our Nation’s Waters* (September 20, 2012) <http://water.epa.gov/action/cleanwater40/cwa101.cfm>.

<sup>10</sup> *Id.*

<sup>11</sup> *Id.*

<sup>12</sup> *Id.*

<sup>13</sup> *Id.*

just a potential to discharge.<sup>14</sup> The 2011 decision in *National Pork Producers Council v. EPA* furthered the assertion that the EPA cannot require permits prior to any discharge occurring.<sup>15</sup> The court's determination that requiring permits for "proposed discharges" lies outside of the statutory construction of the CWA was a large victory for CAFOs and a concerning loss for environmental groups.<sup>16</sup>

While point source discharge from CAFOs is a concern in and of itself, groundwater contamination is not even addressed by the CWA.<sup>17</sup> Groundwater is the water below the earth's surface that flows between porous spaces in soil and rock formations.<sup>18</sup> Significantly, groundwater supplies water for 51 percent of the U.S. population, and this figure is even greater for rural populations.<sup>19</sup> The CAFO waste storage systems present a huge risk for groundwater contamination, as they are prone to leaks and seepages directly into groundwater that may subsequently find its way into drinking wells.

### **III. Hog Farming in North Carolina**

North Carolina has experienced the changing tides of large agribusiness, most dramatically in the hog farming industry. During the 1980's and early 1990's, the hog industry of North Carolina exploded with the help of state politician Wendell Murphy. A hog farmer himself, Murphy supported exempting hog farms from local zoning laws, helped them procure tax exemptions and subsidies, and provided protection from environmental litigation.<sup>20</sup> With this favorable business climate in place, large corporations such as Smithfield Food, Inc. made

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<sup>14</sup> *Waterkeeper Alliance et al. v. EPA* 399 F.3d 486 (2005).

<sup>15</sup> *Pork Producers Council v. EPA* 635 F.3d 738 (2011).

<sup>16</sup> *Id.* at 752.

<sup>17</sup> Clean Water Act 33 U.S.C. §1251.

<sup>18</sup> The Groundwater Foundation 2015.

<sup>19</sup> *Id.*

<sup>20</sup> Stith, Pat. "Murphy's Law: For Murphy, Good Government Means Good Business" THE NEWS & OBSERVER (February 22, 1995).

eastern North Carolina their home.<sup>21</sup> The influx of large agribusiness led to a decrease in smaller farms and the overall total number of farms, yet dramatically increased the number of animals within the state. In 1986, there were 15,000 hog farms in the state, with approximately 2.5 million total hogs. By 2007, there were only 2,800 remaining farms, and a staggering 10 million hogs.<sup>22</sup> Today, North Carolina ranks 2<sup>nd</sup> in total number of pigs produced, behind only Iowa.<sup>23</sup> The majority of the animals are concentrated in the southeast region of the state, particularly in Dublin, Sampson, Bladen, and Robeson counties.<sup>24</sup> Notably, the hog farms in these rural counties are clustered around low socioeconomic and minority communities.<sup>25</sup>

The large-scale hog operations in eastern North Carolina quickly made it on environmentalists' radar with major concerns of water pollution. In 1995, the waste lagoon at the Ocean View Farm in Onslow County overflowed and spilled 25 million gallons of manure into the New River and resulted in massive die-offs of aquatic life.<sup>26</sup> Lagoon is a deceptive name for what in reality is a man-made outdoor basin that is filled with animal waste.<sup>27</sup> They are typically around eight to twenty feet deep and the de-oxygenated conditions in the depth of the waste allow for anaerobic respiration to convert volatile organic compounds into carbon dioxide and methane.<sup>28</sup> The remaining nutrients in the liquid waste can then be used to fertilize crop fields.<sup>29</sup> While lagoons are a cheap way to deal with the problem of the massive amounts of waste

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<sup>21</sup> North Carolina in the Global Economy, Duke Center on Globalization, Governance & Competitiveness 2015

<sup>22</sup> U.S. Department of Agriculture. National Agricultural Statistical Service. North Carolina Field Office.

<sup>23</sup> *Id.*

<sup>24</sup> Nicole, Wendee. CAFOs and Environmental Justice: The Case for North Carolina *Environ Health Perspect* 121:A182-A189 (2013).

<sup>25</sup> *Id.*

<sup>26</sup> *Huge Spill of Hog Waste Fuels an Old Debate in North Carolina*, N.Y. TIMES (Jun. 25, 1995)

<http://www.nytimes.com/1995/06/25/us/huge-spill-of-hog-waste-fuels-an-old-debate-in-north-carolina.html>.

<sup>27</sup> [http://water.epa.gov/scitech/wastetech/upload/2002\\_10\\_15\\_mtb\\_alagoons.pdf](http://water.epa.gov/scitech/wastetech/upload/2002_10_15_mtb_alagoons.pdf).

<sup>28</sup> *Id.*

<sup>29</sup> *Id.*

produced at CAFOs, they are prone to spills in adverse weather, seepage into groundwater, and can emit noxious odors.<sup>30</sup>

The concern of the safety of lagoons was highlighted again when Hurricane Floyd hit the North Carolina coast in 1999 and flooded many of the lagoons.<sup>31</sup> Waste flowed out of the lagoons into rivers and created a great public health concern that private wells would be exposed to bacteria.<sup>32</sup> With the hogs still producing waste, in fact four times as much as humans, farmers had to scramble to figure out what to do with the waste.<sup>33</sup>

One practice that hog farmers use to reduce the waste in lagoons is to spray the untreated, liquefied manure directly onto crop fields. This practice is employed by 95 percent of the hog farms in North Carolina, and offers a more cost effective option than hauling away waste in trucks and directly applying the manure to the soil.<sup>34</sup> The high pressure spraying practice allows particles of manure to become airborne and travel large distances. Communities situated near the fields constantly complain of the overwhelming odors, which can lead to difficulty breathing, asthma attacks, bronchitis and difficulty sleeping.<sup>35</sup> Links have been found between the odors of sprayed manure, the hydrogen sulfide released from the manure and high blood pressure in residents near sprayed fields.<sup>36</sup> Overall, communities near the fields and lagoons who cannot even spend time outside some days report a lower quality of life.<sup>37</sup>

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<sup>30</sup> *Id.*

<sup>31</sup> Peter T. Kilborn, *Hurricane Reveals Flaws in Farm Law as Animal Waste Threatens N. Carolina Water*, N.Y. TIMES (Oct. 17, 1999) <http://www.nytimes.com/1999/10/17/us/hurricane-reveals-flaws-in-farm-law-as-animal-waste-threatens-n-carolina-water.html?pagewanted=all>.

<sup>32</sup> *Id.*

<sup>33</sup> *Id.*

<sup>34</sup> Ron Seely, *Manure Spraying Under Scrutiny*, WISCONSINWATCH.ORG (April 27, 2014) <http://wisconsinwatch.org/2014/04/manure-spraying-under-scrutiny/>.

<sup>35</sup> Nicole, *Environ Health Perspect* 121:A182-A189.

<sup>36</sup> *Id.*

<sup>37</sup> *Id.*

#### **IV. Regulation History in North Carolina**

The major lagoon overflows of the late 1990s managed to induce some action on the part of the state legislature. The Clean Water Responsibility and Environmentally Sound Policy Act of 1997 placed a moratorium on the construction of farms with 250 or more hogs, the expansion of existing farms, and the building of new lagoons and animal waste management systems.<sup>38</sup> This piece of legislation however did nothing to improve the conditions and practices of existing lagoons.<sup>39</sup>

A permanent ban on the building of new lagoons came in 2007 through the Swine Farm Performance Standards Bill.<sup>40</sup> Once again though, existing operations could continue to utilize their lagoons and practice spraying. The legislation did provide for a cost-sharing program to incentivize farms to update their waste management systems to incorporate Environmentally Superior Technologies (EST).<sup>41</sup> However, as of 2014, only two of the approximately 2,800 farms in the state chose to complete the lagoon conversion program.<sup>42</sup> Much to the chagrin of the environmental community, the 2007 bill also contained a provision which would allow farmers to go ahead and replace their current lagoons if their structural integrity was in imminent danger of failing.<sup>43</sup>

Lagoons survived a third piece of North Carolina state legislation that came in 2011. This “Act to facilitate improved operations and conditions at certain preexisting swine farms by

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<sup>38</sup> North Carolina Sess. Law 1997-485.

<sup>39</sup> *Id.*

<sup>40</sup> North Carolina Sess. Law 2007- 523.

<sup>41</sup> *Id.*

<sup>42</sup> Annual Report to the Environmental Review Commission of the North Carolina General Assembly of the Implementation of the Lagoon Conversion Program 2014.

<sup>43</sup> North Carolina Sess. Law 2007- 523.

providing for the construction or renovations of swine houses at those farms” allows for the update of buildings without having to update waste management systems to ESTs.<sup>44</sup>

## **V. Current Permit Requirements and Enforcement**

While hog CAFOs in North Carolina have actively resisted the NPDES permit program that is issued under the CWA, the state has its own permit for the waste management systems of animal operations.<sup>45</sup> Referred to as the “General Permit”, it is issued by the Environmental Management Commission (EMC) of North Carolina’s Department of Energy and Natural Resources (DENR).<sup>46</sup> A facility must get a permit for its waste management system if its meet the statutory definition of “animal operation,” meaning it has 250 or more hogs.<sup>47</sup> The animal waste management system is considered to be the “combination of structures and nonstructural practices serving a feedlot that provide for the collection, treatment, storage, [and] land application of animal waste.”<sup>48</sup> The most recent renewal of the provisions of this permit was finalized on March 7, 2014, and will be in effect until September 30, 2019. Over 2,000 hog farms in North Carolina are subject to the requirements of this permit.<sup>49</sup>

The renewal of this version of the permit is significant because it does not require the waste management systems to adhere to any higher environmental standards than the last version of the permit. Despite available advanced technology, the permit still provides for the persistence of preexisting lagoons and sprayfield practices.<sup>50</sup> Unsurprisingly, there has been a strong

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<sup>44</sup> North Carolina Sess. Law 2011-118.

<sup>45</sup> N.C. Gen. Stat. § 143-215.1(a)(12) (2013).

<sup>46</sup> Swine Waste Management System General Permit AWG10000 (“General Permit”).

<sup>47</sup> 115A N.C. Admin. Code § 2T.1304 (2014).

<sup>48</sup> N.C. Gen. Stat. § 143-215.10B(3).

<sup>49</sup> North Carolina Department of Environmental Quality <http://portal.ncdenr.org/web/wq/animal-facility-map>.

<sup>50</sup> General Permit.

backlash from environmental groups, such as EarthJustice, who were quick to point out some of the major shortcomings of this current version of the permit.<sup>51</sup>

Under the General Permit, hog waste may be sprayed as close as 100 feet from a well that would provide drinking water. This is in spite of research that indicates that nitrates can travel over 300 feet from hog facilities.<sup>52</sup> After spraying the waste, the permit allows 60 days to perform an analysis of a representative sample of soil for only nitrogen, phosphorous, zinc and copper. Not only is this too long of a window to properly assess the nutrient impact, it also fails to address the need for more advanced microbial profiling of the manure.<sup>53</sup> Studies have shown that antibiotic-resistant strains of *E.coli* have been detected near swine facilities that utilize lagoons and sprayfields, yet no requirement to monitor this dangerous bacterium exists.<sup>54</sup>

Additionally, the monitoring practices required under permit are grossly inadequate. While the industry best practice is use of automated lagoon waste level monitors and recorders, their implementation is not required.<sup>55</sup> In the event of a mass burial of animals, it is also not a requirement to monitor the groundwater on premises for seepage of potentially contaminated fluids.<sup>56</sup> This is in spite of the recent emergence of Porcine Epidemic Diarrhea (PED), a high mortality hog disease spread through feces.<sup>57</sup> In the event of a serious system failure, the permit does not require any notification to the public that their health and community are at risk.<sup>58</sup>

Even the enforcement of the existing provisions of the permit is insufficient to protect communities and the environment against the waste system hazards. Major cuts at DENR left a

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<sup>51</sup> EarthJustice EPA complaint September 3, 2014 (“EarthJustice complaint”) <http://earthjustice.org/sites/default/files/files/North-Carolina-EJ-Network-et-al-Complaint-under-Title-VI.pdf>.

<sup>52</sup> *Id.*

<sup>53</sup> *Id.*

<sup>54</sup> Anderson, M.E., Sobsey, M.D. *Detection and Occurrence of Antimicrobially Resistant E. coli in Groundwater on or near Swine Farms in Eastern North Carolina*, 54 WATER SCI. & TECH. 211,217 (2006).

<sup>55</sup> EarthJustice Complaint.

<sup>56</sup> *Id.*

<sup>57</sup> American Society of Swine Veterinarians.

<sup>58</sup> General Permit.

skeleton staff of inspectors responsible for the thousands of hog farms that hold the permit.<sup>59</sup> The permit does not set forth any practices beyond simple visual inspection to ensure that waste collection, treatment, and storage structures are in working order and not leaking pollutants.<sup>60</sup> Ultimately, the permit merely establishes a system of self monitoring where the swine facilities make their own records, but are not require to share them with the public or DENR.<sup>61</sup> Without measures in place to ensure accountability, there is little incentive for farmers to adhere strictly to the few restrictions they are provided.

## **VI. EPA Probe into Civil Rights Violations by the Hog Industry**

A defining characterization of the communities affected by the lagoons and sprayfield practices is their disproportionately large population of minorities. After the September 2014 approval of the latest version of the General Permit, a complaint was filed with the EPA for relief under Title VI of the Civil Rights Act of 1964, 42 U.S.C. §§ 2000d to 2000d-7, and the United States Environmental Protection Agency's implementing regulations, 40 C.F.R. Part 7.<sup>62</sup> North Carolina Environmental Justice Network, Rural Empowerment Association for Community Help (REACH), and Waterkeeper Alliance Inc, filed the complaint and are alleging that state agencies, such as DENR, cannot operate in racially discriminatory way. They are claiming that DENR has systematically ignored the complaints of minority communities that lagoons and spray systems are adversely affecting their quality of life by permitting their continued existence.

The EPA agreed to start an official investigation of the allegations in early 2015. However, their 180-day deadline to respond passed in August 2015 without a report or indication

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<sup>59</sup> EarthJustice Complaint.

<sup>60</sup> *Id.*

<sup>61</sup> *Id.*

<sup>62</sup> *Id.*

when one would be issued. The EPA's pattern of failing to take prompt action in response to public claims makes this a hardly surprising development.<sup>63</sup>

## **VII. Conclusion**

The tensions between agribusiness corporate interests and the ability of the government to regulate farms, particularly CAFOs could hardly be more evident than in North Carolina. Article XIV § 5 of the North Carolina constitution guarantees the conservation and protection of all of the state's lands and waters for the benefit of all of its citizenry, and promises to control and limit pollution.<sup>64</sup> When communities are questioning their health and losing their streams, ponds and rivers that they have relied on for fishing and recreational activities, it is hard to feel confident that North Carolina is doing as much as it can to meet this constitutional commitment.

On a national level, one gets the sense that the Clean Water Act in its current form is ill equipped to handle the pollution risks presented by the emergence of Concentrated Animal Feeding Operations. Without the ability to consistently issue permits to CAFOs and monitor their point source discharges and groundwater runoff, the EPA is leaving the job of pollution regulation to those who have no economic incentive to follow the environmental best practices.

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<sup>63</sup> *Clock Ticking as EPA Prepares Response Over Hog Pollution*, N.C. HEALTH NEWS (Aug. 18, 2015) <http://www.northcarolinahealthnews.org/2015/08/18/clock-ticking-as-epa-prepares-response-over-hog-pollution/>.

<sup>64</sup> N.C. CONST. art. XIV, § 5.