



March 4, 2019

Via e-mail to [Christine.Lawson@ncdenr.gov](mailto:Christine.Lawson@ncdenr.gov) and [Swinepermit.comments@ncdenr.gov](mailto:Swinepermit.comments@ncdenr.gov)  
DWR Animal Operations  
Attn: Swine General Permit  
1636 Mail Service Center  
Raleigh, NC. 27699-1636

**Re: Draft Swine Waste Management System General Permit (AWG100000)**

Dear DWR Animal Operations:

We submit these comments on the draft Swine Waste Management System General Permit (AWG100000) (“Draft Permit”) on behalf of the North Carolina Environmental Justice Network (“NCEJN”), the Rural Empowerment Association for Community Help (“REACH”), Waterkeeper Alliance, Inc. (“Waterkeeper”), the Crystal Coast Waterkeeper and the North Carolina State Conference of the NAACP. To avoid redundancy, we incorporate by reference the attached comments submitted on our clients’ behalf on December 21, 2018, as part of the stakeholder process.<sup>1</sup>

As an initial matter, and in connection with our representation of NCEJN, REACH and Waterkeeper in the 2014 administrative complaint alleging racial discrimination filed against DEQ with the U.S. Environmental Protection Agency (EPA) under Title VI of the Civil Rights Act of 1964 (“Title VI complaint”), we refer you to the “Background” section of those comments, which summarizes information provided to DEQ in 2013 concerning the racially discriminatory impacts of the current general permit.<sup>2</sup> Those impacts include air and water pollution emanating from the open pits of waste and sprayfields in which DEQ-permitted swine operations store and disperse billions of gallons of feces, urine and other waste. The consequences of this system are not just environmental, but also racially discriminatory, because they disproportionately burden non-white North Carolinians.

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<sup>1</sup> See *NCEJN, REACH, and Waterkeeper Alliance Stakeholder Comments on General Permit (AWG 100000) (Dec. 21, 2018)*. These comments are herein incorporated by reference and attached hereto as Exhibit 1. See also *Sound Rivers, Cape Fear River Watch, Winyah Rivers Foundation, Crystal Coast Waterkeeper, Crystal Coast Riverwatch, White Oak-New Riverkeeper Alliance, Haw River Assembly, Yadkin Riverkeeper, Catawba Riverkeeper Foundation, Broad River Alliance, and Mountain True, Stakeholder Comments on General Permit (AWG 100000) (Dec. 21, 2018)*; *National Resources Defense Council and Center for Biological Diversity, Stakeholder Comments on General Permit (AWG 100000) (Dec. 21, 2018)*, which are herein incorporated by reference and attached hereto as Exhibits 2 and 3.

<sup>2</sup> See *Complaint by NCEJN, REACH, and Waterkeeper Alliance Against North Carolina DEQ (EPA File No. 11R-14-R4), September 3, 2014* (hereinafter, “Complaint,” attached hereto as Exhibit 4).

DEQ continues violating Title VI because the agency has failed to exercise its authority to provide adequate protections for the health and welfare of surrounding communities and, knowing the risks and impacts of the lagoon and sprayfield system in eastern North Carolina, failed to exercise its duty to include terms to identify and protect those communities in the draft Swine General Permit. We urge DEQ to begin planning now for the transition of North Carolina's swine industry from the antiquated lagoon and sprayfield system to a more sustainable foundation for farming in the state; at a minimum, though, the Draft Permit must comply with the mandates of Title VI, and should be changed to include the following:

- 1) At page 1, an additional provision should be added to the new section listing the “[r]easons for requiring application for an individual permit,” that expressly recognizes the agency’s mandate to comply with Title VI, as follows:
  - Subsection (h) “*a determination that the operation contributes to cumulative and/or discriminatory impacts on communities of concern.*”<sup>3</sup>
- 2) Also at page 1, the permit duration period should be shortened from 5 to 2 years (“*This General Permit shall be effective from October 1, 2019 until September 30, 2021*”). This change is necessary given DEQ’s public representation that the Environmental Justice geographic mapping tool (“EJ Tool”) it is developing will not be ready to conduct a disparate impact and cumulative impacts analysis of facilities operated by applicants for the 2019 General Permit. Limiting the permit’s duration to two years would demonstrate DEQ’s bona fide commitment to implement the EJ Tool and conduct the necessary analyses within the next two years, make appropriate changes to the 2021 General Permit, and require swine operators to adopt less discriminatory alternative means of waste disposal within a reasonable timeframe. The 2-year time period would also afford the opportunity for DEQ to consider additional evidence of impacts by considering PLAT and groundwater monitoring data envisioned in this draft permit, as well as water monitoring data now collected pursuant to the Settlement Agreement DEQ reached with NCEJN, REACH, and Waterkeeper.<sup>4</sup>

In addition to and in support of the above requests, and in light of DEQ’s response to the changes we requested during the stakeholder process to protect communities of concern, the pork industry’s responses to those requests, and the subsequent changes in the Draft Permit, we direct DEQ’s consideration to the following:

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<sup>3</sup> Our definition of “communities of concern” is based upon EPA guidelines, which refer to “populations of concern” and “vulnerability” defined by “characteristics of individuals or populations that place them at increased risk of an adverse health effect.” See *Risk Assessment Forum, U.S. Env’tl. Prot. Agency, Framework for Cumulative Risk Assessment*, EPA/630/P-02/001F (2003). EPA considers a number of factors to determine vulnerability: susceptibility/sensitivity, differential exposure, differential preparedness, and differential ability to recover. *Id.*, at 39. In the North Carolina context, these factors would include the density of hog operations and proximity to other polluting sources, such as poultry operations.

<sup>4</sup> See Settlement Agreement, Case 11R-14-R4, attached hereto as Exhibit 5; DEQ, Stocking Head Creek Watershed Study, <https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/shc-study>.

## 1. EPA's "Letter of Concern"

In January 2017, the EPA issued a "letter of concern" to DEQ as part of its investigation of our clients' Title VI complaint.<sup>5</sup> The 23-page letter describes results not only from EPA's site visits to Duplin, Sampson, Northampton and Pender Counties, where it interviewed "over 60 residents living near industrial swine operations permitted under the Swine Waste General Permit,"<sup>6</sup> but also its assessment of over two decades of scientific research and "reports published by or with federal agencies."<sup>7</sup> The EPA notes that the

adverse impacts on nearby residents from the lagoon spray field method of treatment and disposal of waste from industrial swine operations are documented in numerous peer reviewed scientific studies, including more than thirty conducted in North Carolina.... [T]he reports provide consistent support for the occurrence of potential health hazards (e.g., eye, nose, and throat irritation; headaches; respiratory effects including asthma exacerbation; waterborne disease) at industrial swine operations and in their waste. Even while there is significant uncertainty regarding the levels of exposure in nearby communities to the identified contaminants and the risk of health effects attributable to those exposures, the risk for specific health effects in communities near industrial swine operations is a concern.

North Carolina's 1994 Swine Odors Task Force stated "It is not surprising to learn that living near a swine operation can affect mental health" when discussing a Duke University study of "the moods of people exposed to odors from commercial swine operations in North Carolina. Forty-four neighbors of hog operations ... had less vigor and were significantly more tense, depressed, angry, fatigued, and confused."<sup>8</sup>

The letter then describes the EPA's consideration of the disparate impact analysis conducted by Drs. Steve Wing and Jill Johnston.<sup>9</sup> EPA warned DEQ of its "deep concern about the possibility that African Americans, Latinos, and Native Americans have been subjected to discrimination as the result of NC DEQ's operation of the Swine Waste General Permit program" in violation of Title VI and EPA's ensuing regulations.<sup>10</sup> EPA also expressed "grave concern" that our clients' members and staff had suffered intimidation from pork industry representatives in their efforts to get DEQ to address the harmful impacts from swine operations.<sup>11</sup>

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<sup>5</sup> Letter from EPA to DEQ in Case 11R-14-R4, January 12, 2017 (attached hereto as Exhibit 6).

<sup>6</sup> *Id.* at 3.

<sup>7</sup> *Id.* at 6.

<sup>8</sup> *Id.* at 6.

<sup>9</sup> See Steve Wing and Jill Johnston, *Industrial Hog Operations in North Carolina Disproportionately Impact African-Americans, Hispanics and American Indians* (rev. Oct. 19, 2015), submitted to EPA in Case-11R-14-R4 (attached hereto as Exhibit 7).

<sup>10</sup> See Exh. 6 at 1.

<sup>11</sup> *Id.* at 8.

EPA's letter concludes with seven sets of "preliminary" recommended actions. While all seven are critical, these three most directly relate to our requests:

- Conduct an assessment of current Swine Waste General Permit to determine what changes to the Permit should be made in order to substantially mitigate adverse impacts to nearby residents. Determine which changes are currently within NC DEQ's authority to make and develop a timetable for adopting them. For Permit changes necessary to substantially mitigate the adverse impacts that NC DEQ cannot adopt, determine the source of the impediment to their adoption.
- Conduct an assessment of current regulations applicable to facilities operating under the Swine Waste General Permit to determine what if any changes to the regulations would be required to substantially mitigate adverse impacts to nearby residents. Determine which changes are currently within NC DEQ's authority to make and develop a timetable to adopt them. For regulatory changes necessary to substantially mitigate the adverse impacts that NC DEQ cannot adopt, determine the source of the impediment to their adoption.
- Conduct an assessment of current mitigation technologies that would satisfy NC DEQ's performance criteria for new or expanding industrial swine operations and what if any impediments exist to adopting those technologies.

It has been more than two years since EPA made the above recommendations. It has been more than a decade since such "mitigation technologies" were identified. It is unacceptable for DEQ to refuse to comply with its obligations under Title VI for another five years.

## **2. The Title VI Settlement**

As part of the May 2018 settlement reached with DEQ, the agency agreed to a number of provisions to comply with its obligations under Title VI, including establishment of an effective Title VI program, improvements in environmental and public health protections in the Draft Permit, inclusion of impacted community members in the stakeholder input process, and development of an Environmental Justice geographical information tool ("EJ tool") to "allow DEQ programs to conduct environmental justice analyses" as a part of permitting.<sup>12</sup> At DEQ's February 4, 2019 public meeting regarding the EJ tool, the Department's Title VI Administrator, Sarah Rice, indicated that the tool will not be ready for implementation as part of the 2019 General Permit renewal.

It is necessary to address some apparent misunderstanding about the General Permit's discriminatory nature. During the Draft Permit public hearing on February 19, 2019, N.C. House Representative Jimmy Dixon incorrectly stated that claims of racially discriminatory impacts from "our animal facilities" are "misrepresented facts" because "if you take our animal facilities and you

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<sup>12</sup> See Exh. 5. The agreement also contains other steps that DEQ must take, including a proposed implementation rule for the Violation Points System (see below at 26)(Exh. 5 at 5) and terms regarding acceptance of third-party data (See, *Letter from Sheila Holman to Complainants*, May 3, 2018, attached hereto as Exhibit 8).

measure one half mile from them, it is 62% white." We set aside for the moment questions regarding what Rep. Dixon meant by "our animal facilities." We also question the relevance of Rep. Dixon's selection of a half mile as the appropriate metric for consideration, given that:

- 1) Significantly fewer people (less than one tenth as many) live within a half mile of a permitted swine operation than live within three miles. People living between a half mile and three miles away from any one CAFO are impacted by a higher concentration of CAFOs (sometimes dozens at once) than those living within a half mile of their closest CAFO;<sup>13</sup>
- 2) Decades of scientific research demonstrates air (including odor) and water pollution and concomitant adverse health effects experienced by residents within a radius greater than one-half mile of swine CAFOs in eastern North Carolina;<sup>14</sup>
- 3) Complaints of horrible odor, flies, buzzards and other burdens from neighboring CAFOs have been made by the REACH members who live more than a half mile from multiple CAFOs (both swine and poultry); and
- 4) All four nuisance cases tried so far against Smithfield (which resulted in multi-million- dollar jury verdicts) involved residents living more than a half mile from swine operations covered under DEQ's General Permit.

It is, however, critical to address a more fundamental misrepresentation underlying Rep. Dixon's statement. Latino, Native American and African Americans constitute a minority of North Carolina's population as compared to whites and as explained in the

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<sup>13</sup> See Fliss et. al, *Comments on Swine General Permit (AWG 100000)*, March 4, 2019.

<sup>14</sup> See e.g., Melva Okun, *Envntl. Res. Program, UNC School of Public Health, Human Health Issues Associated with the Hog Industry* (1999); Todd Cole and Steve Wing, *Concentrated Swine Feeding Operations and Public Health: A Review of Occupational and Community Health Effects*, 108 *Envntl. Health Persp.* 685-699 (2000); Steve Wing, Rachel Avery Horton, Stephen W. Marshall, Kendall Thu, Mansoureh Tajik, Leah Schinasi and Susan S. Schiffman, *Air Pollution and Odor in Communities Near Industrial Swine Operations*, 116 *Envntl. Health Persp.* 1362 (2008); Wendee Nicole, *CAFOs and Environmental Justice: The Case of North Carolina*, 121 *Envntl. Health Persp.* A182, A186 (2013); Steve Wing, Rachel Avery Horton and Kathryn M. Rose, *Air Pollution from Industrial Swine Operations and Blood Pressure of Neighboring Residents*, 121 *Envntl. Health Persp.* 92 (2013); Steve Wing and Jill Johnston, *Industrial Hog Operations in North Carolina Disproportionately Impact African-Americans, Hispanics and American Indians* (rev. Oct. 19, 2015) and published studies referenced therein (Exh. 7); Virginia T. Guidry, Alan C. Kinlaw, Jill Johnston, Devon Hall and Steve Wing, *Hydrogen Sulfide Concentrations at Three Middle Schools Near Industrial Livestock Facilities*, 27 *J. Expo. Sci. Environ. Epidemiol.* 174 (2017); Julia Kravchenko et al, *Mortality and Health Outcomes in North Carolina Communities Located in Close Proximity to Hog Concentrated Animal Feeding Operations*, 79 *N.C. Med. J.* 278 (2018).

methodology section of Drs. Wing and Johnston’s analysis (see Exhibit 7), “a larger *proportion* of non-Hispanic Whites in North Carolina live in remote rural areas than do Blacks.”<sup>15</sup> However, the “percentages of [people of color, defined as everyone other than non-Hispanic whites], Blacks, Hispanics, and American Indians living within 3 miles of [an industrial hog operation] are 1.38, 1.40, 1.26 and 2.39 times higher than the percentage of non-Hispanic Whites, respectively.”<sup>16</sup> These disparities are “highly statistically significant,”<sup>17</sup> which means they are not by chance or random.

So while it is correct that most people living near swine CAFOs in North Carolina are white—because whites are still the racial majority in the state and a larger proportion of that white population lives in rural areas—it is incorrect to conclude that there is no racially disparate impact from these facilities. Such a statement ignores the analysis and methodology required to determine disparate impact,<sup>18</sup> as well as the fact that although non-whites make up a minority of the total population, the communities living near permitted hog operations have disproportionately high percentages of black, Latino and Native American residents.

Furthermore, the fact that there are also white people living in those communities does not contradict or rebut the statistical evidence presented by our clients to DEQ and acknowledged by the EPA that these operations disproportionately burden communities of color. Indeed, white residents living in proximity to hog operations would also benefit from cleaner air and water if DEQ required Permittees located near communities of concern to employ stronger protections and superior waste disposal technologies, but the agency’s legal obligation under Title VI is to mitigate the demonstrated disparate impact on North Carolinians of color.

Given these facts and DEQ’s obligation to comply with Title VI, the EJ tool must be designed, developed and deployed not only to identify whether a permit applicant’s barns, lagoons and sprayfields are in close proximity to vulnerable populations (as measured by those neighbors’ demographic and health indicators) and to a cluster of other facilities and other sources of pollution, but also to assess potential cumulative impacts from other polluting operations within the three-mile radius.<sup>19</sup>

The EPA has defined “cumulative impacts” as the “[t]otal exposure to multiple environmental *stressors* . . . , including exposures originating from multiple *sources*, and traveling via multiple pathways over a period of time.”<sup>20</sup> Incorporated here by reference and attached as Exhibit 10 is our

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<sup>15</sup> Wing and Johnston, *supra* n.9, Exh. 7 at 1 (emphasis added).

<sup>16</sup> *Id.* at 6.

<sup>17</sup> *Id.*

<sup>18</sup> *Id.*

<sup>19</sup> See also G.S. 143-215.1(b)(2) (“The Commission shall also act on all permits so as to prevent violation of water quality standards due to the cumulative effects of permit decisions. Cumulative effects are impacts attributable to the collective effects of a number of projects and include the effects of additional projects similar to the requested permit in areas available for development in the vicinity. All permit decisions shall require that the practicable waste treatment and disposal alternative with the least adverse impact on the environment be utilized.”).

<sup>20</sup> *Draft Title VI Guidance for EPA Assistance Recipients Administering Environmental Permitting Programs and Draft Revised Guidance for Investigating Title VI Administrative Complaints Challenging Permits*, 65 Fed. Reg. 39650, 39684 (June 27, 2000).

September 2, 2016 letter brief to the EPA on cumulative impacts from hog CAFOs covered by DEQ's General Permit, which addresses with supporting research three stressors that contribute to the General Permit's cumulative adverse impact:

First, EPA must account for the cumulative impacts of more than 2,000 IHOs [industrial hog operations] in a relatively small geographic area. Eastern North Carolina is more densely populated with hogs than anywhere else in the United States. Second, EPA must analyze the environmental contamination and associated risks to human health stemming from the cumulative impacts of IHOs and the many industrial poultry operations clustered in this same region. Finally, any analysis of the adverse impacts of IHOs in eastern North Carolina would be grossly inadequate without consideration of the affected community's pre-existing vulnerability, which results from racial discrimination, poverty, and other factors.<sup>21</sup>

Consideration of cumulative impacts is particularly critical given the co-location of the swine and poultry industries in the state. As of 2018, there were 516 million birds confined in industrial operations in North Carolina, up from 147 million in 1997, according to a recent report by the Environmental Working Group and Waterkeeper Alliance.<sup>22</sup> The report found that industrial hog and poultry farms in the state are highly concentrated together, with 93 percent of poultry operations located within just three miles of 20 or more other poultry and swine operations.<sup>23</sup> Pollution from both swine and poultry facilities is now contaminating the same waterbodies,<sup>24</sup> which are already suffering from high nutrient loads. Poultry manure, which is often applied as fertilizer, contains many of the same nutrients as hog manure, including nitrogen and phosphorus. At this point, statewide, industrialized poultry operations cause even more nutrient pollution than hogs.<sup>25</sup> The presence of both poultry and hog facilities in the same areas raises the risks of harms to water quality. Therefore, the co-location of industrial hog and poultry operations demands that the permit require the assessment of cumulative impacts from both kinds of operations – to ensure that decisions take account of real-world conditions

In sum, in order to comply with Title VI, DEQ must take significant steps in the 2019 General Permit to address the permit's discriminatory and cumulative impacts. The above requested changes on page 1 of the Draft Permit are two necessary steps.

As described in our December 21, 2018 stakeholder comments, important recent events make this the most critical time for major changes in the Swine General Permit, including Smithfield's announcement of its plans for methane recapture at many of its operations; the increased

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<sup>21</sup> *Letter to Lilian Dorka, Interim Director, EPA Office of Civil Rights in Case 11R-14-R4*, September 2, 2016, at 9 (attached hereto as Exhibit 9 with names of declarants redacted).

<sup>22</sup> Soren Rundquist & Don Carr, *Under the Radar: New Data Reveals NC Regulators Ignored Decade-Long Explosion of Poultry CAFOs* (2019), [https://waterkeeper.org/wp-content/uploads/2019/02/EWG\\_Waterkeeper-NC-CAFO\\_Report\\_Co5.pdf](https://waterkeeper.org/wp-content/uploads/2019/02/EWG_Waterkeeper-NC-CAFO_Report_Co5.pdf).

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

<sup>24</sup> *Id.*

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

frequency and severity of storms and rainfall; and the growing body of scientific literature that demonstrates that industrial hog operations using the lagoon and sprayfield system threaten human health and the environment. We applaud the positive changes that DEQ has made in the Draft Permit and offer the following concerning other specific conditions and terms.

### **Condition I.1: Definition of Discharge and Storm Standards**

We support DEQ's effort to update the definition of the 25-year, 24-hour rainfall event from reliance on an outdated 1960's era bulletin to more recent NOAA standards. However, the Draft Permit undercuts DEQ's recognition that the science and the facts have evolved since the 1990s by allowing facilities to be "designed, constructed, operated, and maintained to contain all waste plus the runoff from a 25-year, 24-hour rainfall event **at the time of construction for the location of the facility**" (emphasis added). As storms hit North Carolina more frequently and more severely, the state needs to ensure that it updates its interpretation of the standard to protect the environment and communities from harmful manure waste runoff. In addition, DEQ must follow the science and require all operations to adhere to the same updated and uniform storm standard rather than outdated definitions established "at the time of construction."<sup>26</sup>

Hurricanes, storms, and extreme precipitation events in North Carolina have increased in both severity and frequency due to climate change.<sup>27</sup> Researchers project that average winter precipitation in North Carolina will increase up to 25% in the next 50 years at the current rate of warming.<sup>28</sup> The number of "heaviest 1%" rainfall events along the Mid-Atlantic coast rose nearly 30% from 1958 to 2016.<sup>29</sup> Since 1999, North Carolina endured at least four hurricanes or tropical storms that qualify as 100-year storms: Floyd in 1999,<sup>30</sup> Irene in 2011,<sup>31</sup> Matthew in 2016,<sup>32</sup> and

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<sup>26</sup> Given the effects of climate change and the increasing frequency of even 100-year storms, if lagoons were to be built today, they should meet the even stricter standards of 100-year/24-hour rainfall events. As indicated above, however, we are not requesting the significant investment that this standard might require. We call on DEQ to plan for the transition from lagoons and sprayfields and in the meantime, recognize that a standard developed for a 25-year/24-hour storm event is grossly inadequate and not sufficiently protective of the waters or people of the state.

<sup>27</sup> U.S. Global Change Res. Program (USGCRP), *2 Fourth National Climate Assessment: Impacts, Risks, and Adaptation* (2018); Gabriele Villarini & Gabriel Vecchi, *Projected Increases in North Atlantic Tropical Cyclone Intensity from CMIP5 Models*, 26 *J. of Climate* 3232, 3232-3240 (2013); Enrico Scoccimarro et al., *Intense Precipitation Events Associated with Landfalling Tropical Cyclones in Response to a Warmer Climate and Increased CO<sub>2</sub>*, 27 *J. of Climate* 4642, 4647-4654 (2014); Donald Wuebbles et al., *CMIP5 Climate Model Analyses: Climate Extremes in the United States*, 95 *Am. Meteorological Soc'y J.* (2014); Brian A. Colle et al., *Historical Evaluation and Future Prediction of Eastern North American and Western Atlantic Extratropical Cyclones in the CMIP5 Models During the Cool Season*, 26 *J. of Climate* 6882, 6882-6903 (2013).

<sup>28</sup> USGCRP, *supra* n.27.

<sup>29</sup> *Id.*; Russ S. Schumacher & Richard H. Johnson, *Characteristics of U.S. Extreme Rain Events During 1999-2003*, 21 *Weather Forecast* 69, 69-85 (2006).

<sup>30</sup> NOAA Nat'l Weather Serv., *Event Overview, Hurricane Floyd Storm Summary*, <https://www.weather.gov/mhx/Sep161999EventReview> (last accessed Feb. 22, 2019).

<sup>31</sup> NOAA Nat'l Weather Serv., *Event Overview, Hurricane Irene August 26-27, 2011*, <https://www.weather.gov/mhx/Aug272011EventReview> (last accessed Feb. 22, 2019).

<sup>32</sup> NOAA Nat'l Weather Serv., *Hurricane Matthew, October 8-9, 2016 Summary*, <https://www.weather.gov/mhx/MatthewSummary> (last accessed Feb. 22, 2019).



Florence in 2018.<sup>33</sup> During Hurricane Floyd, Wilmington experienced a 24-hour record of 15.06 inches of rain.<sup>34</sup> Even according to updated NOAA rainfall standards, this exceeds the 100-year, 24-hour rainfall frequency of 12.7 inches.<sup>35</sup> Hurricane Irene produced enough rain over the northeast portion of the state to exceed a 25-year rainfall event.<sup>36</sup> Hurricane Matthew, which hit North Carolina just 15 years after Floyd, resulted in record levels of precipitation. Rainfall in Fayetteville, in the region of the state most concentrated with swine CAFOs, exceeded the town's 1000-year, 24-hour rainfall event of 8.6 inches by 6 inches.<sup>37</sup> Most recently, Hurricane Florence dumped 8.84 inches of rain within 24-hours in Fayetteville, also exceeding the current storm definition.<sup>38</sup>

The heavy rainfall associated with extreme storms cause severe flooding. For example, multiple rivers and streams in North Carolina reached 100-year flood volumes during both Hurricane Floyd<sup>39</sup> and Hurricane Matthew.<sup>40</sup> During Hurricane Floyd, there were 14 distinct 500-year or greater floods in the eastern part of the state.<sup>41</sup> Sudden inundation of rainfall into uncovered swine manure lagoons caused the volume of waste to exceed the facilities' holding capacity, leading to structural failures and overflowing of waste matter onto flooded fields and into waterways. Hurricane Floyd flooded 45 swine lagoons, causing algal blooms and mass fish die-

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<sup>33</sup> Gavin Off, *Rain Gauge Map: Charlotte Totals at 72 Locations. Some Areas see more than 10 Inches since Friday*, The Charlotte Observer (Sept. 15, 2018), <https://www.charlotteobserver.com/news/local/article218458300.html>.

<sup>34</sup> NOAA Nat'l Weather Serv., *Event Overview, Hurricane Floyd Storm Summary*, <https://www.weather.gov/mhx/Sep161999EventReview> (last accessed Feb. 22, 2019).

<sup>35</sup> NOAA Atlas 14, Volume 2, version 3.0, 2004 revised 2006, [https://hdsc.nws.noaa.gov/hdsc/pfds/pfds\\_map\\_cont.html](https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html); See also [https://www.nws.noaa.gov/oh/hdsc/PF\\_documents/Atlas14\\_Volume2.pdf](https://www.nws.noaa.gov/oh/hdsc/PF_documents/Atlas14_Volume2.pdf).

<sup>36</sup> N.Y. Times, *Flooding, Power Failures, Rainfall and Damage From Hurricane Irene* (Aug. 31, 2011), <https://archive.nytimes.com/www.nytimes.com/interactive/2011/08/27/us/preparations-for-hurricane-irene-and-reports-of-damage.html?ref=us>.

<sup>37</sup> Elena Gooray, *Hurricane Matthew Brought 1,000-Year Record Rainstorms to North Carolina*, Pacific Standard (Oct. 12, 2016), <https://psmag.com/news/hurricane-matthew-brought-1000-year-record-rainstorms-to-north-carolina#.gtjrmj8h7>; See also NOAA National Weather Service, *AEP Storm Analysis Hurricane Matthew October 2016* (2016), [https://www.nws.noaa.gov/ohd/hdsc/aep\\_storm\\_analysis/AEP\\_HurricaneMatthew\\_October2016.pdf](https://www.nws.noaa.gov/ohd/hdsc/aep_storm_analysis/AEP_HurricaneMatthew_October2016.pdf).

<sup>38</sup> Gavin Off, *Florence Rain Gauge Map: Totals for More than 400 Locations Across North Carolina*, The Charlotte Observer (Sept. 16, 2018), <https://www.charlotteobserver.com/news/state/north-carolina/article218495840.html>

<sup>39</sup> Jerad D. Bales et al., *Two Months of Flooding in Eastern North Carolina, September-October 1999: Hydrologic, Water quality, and Geologic Effects of Hurricanes Dennis, Floyd, and Irene*, Water-Res. Investigation Rep. No. 00-4093, U.S. Dept. of the Interior, U.S. Geological Surv. (2000), <https://pubs.usgs.gov/wri/wri004093/flooding.html>.

<sup>40</sup> FEMA, *Hydrologic Analysis of Hurricane Matthew's Impact on Dam Safety in North Carolina and South Carolina* (Aug. 2018), [https://www.fema.gov/media-library-data/15350429374811942dab7f7f79e5f561f3eobcoazd9c/NCSCDamsHydrologicSummary\\_FINAL\\_8-14-18\\_dz.pdf](https://www.fema.gov/media-library-data/15350429374811942dab7f7f79e5f561f3eobcoazd9c/NCSCDamsHydrologicSummary_FINAL_8-14-18_dz.pdf).

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

offs.<sup>42</sup> In 2016 with Hurricane Matthew, at least 14 hog lagoons flooded and two breached. After Hurricane Florence, North Carolina DEQ reported that 6 lagoons experienced structural damage and 33 lagoons overtopped, with an additional 10 lagoons operating at a level where overtopping was likely because the structure had no room to store additional liquid.<sup>43</sup> Overall, the agency reported hundreds of incidents representing environmental threats at animal operations due to flooding and inundation in the wake of the storm.<sup>44</sup>

With heavy rainfall, nutrients and disease-causing agents from sprayfields enter nearby streams through surface and subsurface runoff.<sup>45</sup> These pollutants, such as phosphorus and nitrogen, already have caused significant damage in streams and other water bodies in eastern North Carolina.<sup>46</sup> In addition, pathogens and bacteria from the runoff fecal matter contaminate drinking water sources and threaten human health. In the weeks following Hurricane Florence, nearly 30% of tested drinking water wells contained fecal coliform bacteria at levels above the EPA health-based standard.<sup>47</sup> Drinking water with elevated levels of bacterial contaminants increases the risk of infection and illness.

Extreme rainfall in the future will cause even more runoff from swine waste management systems, polluting the environment and harming public health. DEQ's interpretation of the requirement that lagoons must meet a 25-year/24-hour storm event must keep up with the science and ensure that animal operations are prepared for the increasing severity of rainfall events.

It is inappropriate to ask only that facilities comply with historic standards from ten or twenty years ago when a lagoon was built, because these facilities were not designed to sustain the magnitude of extreme storms today. Prior to the adoption of the 25-year, 24-hour rainfall event developed by the National Oceanic and Atmospheric Administration in 2004, the General Permit

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<sup>42</sup> Steve Wing et al., *The potential impact of flooding on confined animal feeding operations in eastern North Carolina*, 110 *Envtl. Health Persp.* 387, 387-391 (2002).

<sup>43</sup> North Carolina DEQ, *DEQ Dashboard* (Oct. 9, 2018), <https://deq.nc.gov/news/deq-dashboard#animal-operations---swine-lagoon-facilities> (these numbers understate the problem by failing to take into account the practice of lowering lagoons in advance of storms, which also raises the risk of significant runoff during storm event).

<sup>44</sup> North Carolina DEQ, *Hurricane Incident Tracking Application*, <https://ncdenr.maps.arcgis.com/apps/webappviewer/index.html?id=c73b17dfifa8400998c69da505f36eb8>.

<sup>45</sup> Robert Evans et al., *Subsurface Drainage Water Quality from Land Application of Swine Lagoon Effluent*, 27 *Transactions Am. Soc'y Agric. & Biological Eng'rs* 473 (1984); Phil Westerman et al., *Swine Manure and Lagoon Effluent Applied to a Temperate Forage Mixture: II. Rainfall Runoff and Soil Chemical Properties*, 16 *J. Env'tl. Quality* 106 (1987).

<sup>46</sup> Kenneth Stone et al., *Water Quality Status of a USDA Water Quality Demonstration Project in the Eastern Coastal Plain*, 50 *J. Soil & Water Conservation* 567 (1995); James W. Gilliam et al., *Contamination of Surficial Aquifers with Nitrogen Applied to Agricultural Land*, *Water Resources Res. Inst., Univ. of N.C.*, Rep. No. 306 (1996).

<sup>47</sup> Lisa Sorg, *Monday numbers- A Closer Look at Private Drinking Water Wells post-Florence*, NC Policy Watch (Jan. 14, 2019), <http://www.ncpolicywatch.com/2019/01/14/monday-numbers-a-closer-look-at-private-drinking-water-wells-post-florence/>.

used a definition from a 1960's technical bulletin.<sup>48</sup> This standard would have applied to any operation constructed prior to the adoption of the NOAA 2004 definition. A comparison of the precipitation quantities at various storm frequencies demonstrates the increasing probability of experiencing extreme rainfall events. The 1960's rainfall frequency atlas defines a 50-year, 24-hour rainfall event in Fayetteville, NC as just under 7 inches of rain.<sup>49</sup> In the updated atlas, a rainfall event producing between 6.16 to 7.19 inches is predicted to occur every 25 years rather than every 50 years.<sup>50</sup> A 25-year storm standard that would have applied to past permitted facilities now reflects the maximum amount of rain from a 10-year storm.

Operating and maintaining facilities based on historic standards and climate conditions is no longer adequate to limit waste runoff. In Fiscal Year 2017-2018, the large majority of permit violations discovered during Division of Water Resources (DWR) and Division of Soil and Water Conservation (DSWC) inspections related to manure management issues.<sup>51</sup> 20% of all permit violations at swine operations (24 out of 121) were due to discharges from animal waste management systems; 83% of these discharges reached state surface waters.<sup>52</sup> Another 29% of violations documented "inadequate freeboard," in which lagoon structures held waste volumes above the maximum operating level.<sup>53</sup>

#### **Condition I.4: Amendments**

We support the new requirement that amendments be included as part of the CAWMP and be submitted to the Division's Central Office within 30 days. Under the 2014 permit, Permittees were not required to submit an amendment to the Division Office "unless specifically requested." This change will lead to greater transparency and accountability by allowing public access to records of amendments, which will no longer be kept only at the facility. This additional transparency is crucial, allowing community members who are affected by pollution to access information on changes to waste management activities, including land application, and to learn of any changes

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<sup>48</sup> David M. Hershfield, *Technical Paper No. 40, Rainfall Frequency Atlas of the United States for Durations from 30 Minutes to 24 Hours and Return Periods from 1 to 100 Years*, U.S. Dept. of Commerce & Weather Bureau (1961), [https://www.nws.noaa.gov/oh/hdsc/PF\\_documents/TechnicalPaper\\_No40.pdf](https://www.nws.noaa.gov/oh/hdsc/PF_documents/TechnicalPaper_No40.pdf).

<sup>49</sup> *Id.*

<sup>50</sup> Precipitation Frequency Estimate in Fayetteville, NC, NOAA Atlas, [https://hdsc.nws.noaa.gov/hdsc/pfds/pfds\\_map\\_cont.html](https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html) (search by location at latitude: 35.057 and longitude: -78.876).

<sup>51</sup> *Dept. of Env'tl. Quality, Annual Report on Animal Waste Management Permitting, Inspection and Compliance Activities* July 1, 2017 through June 30, 2018 (2019), [https://www.ncleg.gov/documents/sites/committees/BCCI-6658/Reports/FY%202018-19/DEQ\\_DWR\\_Animal\\_Waste\\_Management\\_Annual\\_Report-2019-01-28.pdf](https://www.ncleg.gov/documents/sites/committees/BCCI-6658/Reports/FY%202018-19/DEQ_DWR_Animal_Waste_Management_Annual_Report-2019-01-28.pdf) (last accessed Feb. 24, 2019).

<sup>52</sup> *Id.* at 5, see Table 6.

<sup>53</sup> *Id.* (freeboard is the required depth between the upper edge of the lagoon, usually an elevated diversion terrace constructed around the perimeter of the lagoon, and maximum allowed level of liquid manure storage).

in a reasonable time. This will reduce the likelihood that amendments will lead to adverse effects on the environment.<sup>54</sup>

### **Condition I.12: Setbacks**

We encourage DEQ to adopt stronger setbacks for land application of waste. The current requirements contained in the Draft Permit continue to be inadequate for protecting human health and the environment. DEQ should act on its authority to implement more protective standards for land application than those specified by statute.<sup>55</sup>

Abundant scientific research has demonstrated that land application of waste impairs water quality, supporting the need for strong setbacks.<sup>56</sup> Overapplication and application to saturated soils can cause contaminants to enter waters through runoff.<sup>57</sup> Significantly, even when waste is applied at recommended application rates, contamination can still occur.<sup>58</sup> Research has also linked land application to the presence of antimicrobial residues in stream water,<sup>59</sup> and surface waters near sprayfields have been found to contain high concentrations of fecal indicator bacteria.<sup>60</sup> A study in North Carolina revealed that 22% of the nitrogen in waste applied to sprayfields was lost to offsite transport, suggesting that nitrogen could be contaminating nearby water resources.<sup>61</sup> As mentioned in previous comments, North Carolina needs particularly stringent requirements for setbacks due to its high concentration of industrial animal operations and its unique hydrological and geological features.<sup>62</sup> Porous soil and high water tables increase the risk that nutrients from waste application will contaminate water sources, including drinking water.

Despite its need for especially strong protections for water resources, North Carolina's requirements for setbacks are lower than in other states. In this Draft Permit, setbacks for wells remain only 100 feet, which is significantly lower than other states' requirements. For example, as mentioned in past comments, South Dakota requires setbacks of at least 250 feet from private

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<sup>54</sup> Comments submitted in the stakeholder process, Exh. 1 at 7 (removal of amendments) were also intended to promote transparency. Consistent with that intent, we support the language in the Draft Permit, which clarifies that amendments must be submitted to the Division's Central Office within 30 days.

<sup>55</sup> Statutory requirements set floors for setback distances. See 15A NCAC 02T .0108(b) and 15A NCAC 02T.1304(b)(5); *See also* Exh. 3, at 27-28.

<sup>56</sup> *See* studies cited *infra* n. 57-61.

<sup>57</sup> JoAnn M. Burkholder et al., *Impacts of Waste from Concentrated Animal Feeding Operations on Water Quality*, 115 *Env'tl. Health Persp.* 308 (2007), <http://dx.doi.org/10.1289/ehp.8839>.

<sup>58</sup> *Id.*

<sup>59</sup> UNC Chapel Hill, Dep't of City & Reg'l Planning, Econ. Dev. Workshop, *Identifying Opportunities and Impacts for New Uses of Hog Waste in Eastern North Carolina*, 12-13 (2013), [www.ncgrowth.unc.edu/wp-content/uploads/2014/06/OpportunitiesAndImpactsOfHogWasteInEasternNC.pdf](http://www.ncgrowth.unc.edu/wp-content/uploads/2014/06/OpportunitiesAndImpactsOfHogWasteInEasternNC.pdf)

<sup>60</sup> Christopher D. Heaney, et al. *Source Tracking Swine Fecal Waste in Surface Water Proximal to Swine Concentrated Animal Feeding Operations*, 511 *Sci. Total Env't.* 1 (2015) <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4514616/>

<sup>61</sup> Jeffrey DeBerardinis, *Nitrogen Mass Balance for Spray Fields Fertilized with Liquid Swine Waste*, 67 (2006), <https://cdr.lib.unc.edu/indexablecontent/uuid:612a684e-41c1-464b-bc98-3b6b1ad16247>

<sup>62</sup> *See* Exh. 1, at 8-9; *see also* Exh. 2, at 39-43.

wells,<sup>63</sup> South Carolina requires a 200-foot setback from any drinking well,<sup>64</sup> and Wisconsin requires a 1,000-foot setback from community wells.<sup>65</sup> In addition, Indiana recently required that CAFO waste management systems be located a minimum of 1,000 feet from public water supply wells.<sup>66</sup> Due to the vulnerability of drinking water sources in many areas of North Carolina, land application should only be allowed to occur a minimum of 500 feet from wells, rather than only 100 feet. North Carolina, with its particularly vulnerable water resources, should have even stricter standards than these other states.

While we welcome the inclusion of specific setbacks for land application from water bodies in this Draft Permit, the distances fall far short of what is necessary. The setback requirements prior to 1997 have been recognized to be inadequate; therefore, older facilities should not continue to be held to these weaker standards. The setbacks should equal the distance necessary for preventing contamination of waterbodies, which is DEQ's obligation. Older facilities should not be given more leeway at the expense of environmental quality and impacts on nearby community residents. In addition, having one standard for land application for all facilities will make compliance and enforcement more straightforward.

Even a 75-foot setback from surface waters for all facilities would be inadequate. The EPA NPDES manual requires that setbacks for manure application for large CAFOs must be "a minimum" of 100 feet "from surface waters and conduits to surface waters."<sup>67</sup> Some states have recognized the need for even greater protections. For example, Indiana requires setback distances of 300 feet from surface waters, as of 2018.<sup>68</sup>

#### **Condition II.4: Nutrient Management Plan**

We strongly support the new language clarifying that agronomic rates for land application must account for "all nutrient sources," rather than only nutrients from the swine waste being applied. This change will help ensure that land application does not occur at greater than agronomic rates, since analyses prior to land application should account for all potential nutrient sources, including commercial fertilizer, effluent, sludge, and waste from other animals.

Preventing excessive application of nutrients is critical since the watersheds impacted by land application already suffer from high nutrient loads. For example, nutrient enrichment has been highlighted as the primary threat to water quality in both the Tar Pamlico River Basin and the

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<sup>63</sup> South Dakota Department of Environment and Natural Resources, General Water Pollution Control Permit for Concentrated Animal Feeding Operations, SDG-100000 (April 15, 2017) at 1.1.26.

<sup>64</sup> S.C. Reg. 61-43 Part 100 <https://www.clemson.edu/extension/camm/regulations/r61-43.pdf>; <https://www.scdhec.gov/environment/water-quality/water-quality-agriculture-permits-and-compliance/agricultural-permits-3>.

<sup>65</sup> Wisconsin Administrative Code Chapter N243.15 [https://docs.legis.wisconsin.gov/code/admin\\_code/nr/200/243/II/11](https://docs.legis.wisconsin.gov/code/admin_code/nr/200/243/II/11)

<sup>66</sup> 327 Indiana Administrative Code 19-12-3.

<sup>67</sup> NPDES Permit Writers' Manual for CAFOs, (2012), [https://www3.epa.gov/npdes/pubs/cafo\\_permitmanual\\_entire.pdf](https://www3.epa.gov/npdes/pubs/cafo_permitmanual_entire.pdf).

<sup>68</sup> 327 IAC 19-12-3.

Neuse River Basin.<sup>69</sup> Excessive nutrient enrichment harms the environment by contributing to fish kills, algal blooms, and contamination of drinking water.<sup>70</sup> High nutrient loads in surface and groundwater indicate that land application has failed to occur at proper agronomic rates, leading to excess nutrients being leached into waterways.<sup>71</sup> Moreover, ensuring proper land application practices, and thus preventing water contamination from leached nutrients before it occurs, is especially critical due to the lack of comprehensive water monitoring requirements for CAFOs.

This proposed change is especially important given the rapid rise in the number of poultry operations in the same areas where hog operations are located, discussed above.<sup>72</sup> Under these conditions, application rates must take into account potential impacts of the co-location of poultry and swine facilities. The revision to Condition II.4 is a welcome move in that direction, since it will require that all nutrient sources be accounted for when determining agronomic rates for land application.

### **Condition II.7: Operator in Charge (“OIC”**

We support the clarification regarding the OIC’s responsibilities, which are reasonable measures to ensure that all land application is properly inspected, monitored, documented, and supervised in a timely manner. The additional requirement that if neither the OIC nor designated back-up is present during land-application of waste then the OIC or designee must inspect the application site within 24 hours of the application, should be amended to require not just inspection but completion of the requisite inspection records within that time period. Inclusion of OIC oversight in the permit, and the removal of the overbroad affirmative defense “loophole” is necessary to reduce the risk of discharge and other permit violations and will improve accountability and transparency.

### **Condition II.10: Disposal of Mortalities**

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<sup>69</sup> Div. of Water Res., *Neuse River Basinwide Water Quality Plan* § 17.1.4 (2009), <https://deq.nc.gov/about/divisions/water-resources/planning/basin-planning/water-resource-plans/neuse-2009>. (“Excessive nutrient loading is ultimately the primary stressor in the Neuse River basin.”); Div. of Water Res., *Tar-Pamlico River Basinwide Water Quality Management Plan* § 7.3. (2010), [https://files.nc.gov/ncdeq/Water%20Quality/Planning/BPU/BPU/Tar\\_Pamlico/Tar%20Pam%20Plans/2010%20Plan/TAR\\_SummaryFinal.pdf](https://files.nc.gov/ncdeq/Water%20Quality/Planning/BPU/BPU/Tar_Pamlico/Tar%20Pam%20Plans/2010%20Plan/TAR_SummaryFinal.pdf). (“Tar Pamlico River Basin-Nutrient enrichment of the water bodies within this basin continues to be the main water quality issue.”); *See also* 15A NCAC 2B.0255, .0256 (agricultural nutrient control goal and strategy for the Tar-Pamlico basin); 15A NCAC 2B.0236, .0237 (agricultural nutrient control goal and strategy for the Neuse basin).

<sup>70</sup> Michael Mallin, *Impacts of Industrial Animal Production on Rivers and Estuaries*, 88 *Am. Scientist* 26 (Jan.–Feb. 2000).

<sup>71</sup> The nutrient load in waterways is also affected by the deposition of volatilized ammonia. Calculations of agronomic rates will be grossly inadequate until they take into account this significant nutrient source. It is vital that DEQ require facilities to do so in the next permit.

<sup>72</sup> *See supra* n. 20-22.

We applaud DEQ's decision to clarify that "burial is not recommended for disposal of dead animals." This provision of the Draft Permit is consistent with guidance published by the North Carolina Department of Agriculture and Consumer Services ("DACS"), which deems burial a "limited on site disposal option due to flooded conditions and often minimal depth to seasonal high water table."<sup>73</sup> However, we urge DEQ to impose meaningful safeguards to protect public health and the environment in situations in which burial occurs.

Burial of dead animals can significantly impair water quality.<sup>74</sup> Indeed, burial pits often release more pollution than municipal and industrial sewage plants.<sup>75</sup> As animal carcasses decay, they release nutrients (nitrogen and phosphorus), chloride, disease-causing agents present in animal waste, ammonia, and nitrates into the environment—potentially rendering groundwater unsafe to drink.<sup>76</sup> This pollution continues until carcasses decay completely, a process that can take up to two years.<sup>77</sup>

Improper burial also reduces the quality of life and threatens the health of those living nearby. Areas surrounding industrial animal facilities already host high numbers of flies, birds, and rodents—all of which may feed on improperly buried carcasses.<sup>78</sup> Because animal carcasses can carry antimicrobial-resistant pathogens,<sup>79</sup> improper burial facilitates the movement of these

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<sup>73</sup> N.C. Depart. of Agric., *Mass Animal Mortality Management Plan for Catastrophic Natural Disasters*, 2 (2016), <http://www.ncagr.gov/disaster/documents/massmortalityguidanceplan.pdf>. In emergency conditions that require burial, DACS recommends that operators maintain at least 12 inches of soil between the bottom of the burial hole and the seasonal high water table; maintain at least 3 feet of soil covering any buried animal; maintain at least 300 feet from any existing stream, public body of water, or public water supply well, and at least 100 feet from any other type of existing well; and locating a burial site "so as to minimize the effect of stormwater runoff." N.C. Depart. of Agric., *Animal Burial Guidelines During a Declared Emergency*, 2 (2011), [http://www.ncagr.gov/oep/Storms/ANIMAL\\_BURIAL\\_GUIDELINES\\_April\\_2011.pdf](http://www.ncagr.gov/oep/Storms/ANIMAL_BURIAL_GUIDELINES_April_2011.pdf).

<sup>74</sup> Qi Yuan et al., *Potential Water Quality Impacts Originating from Land Burial of Cattle Carcasses*, 456-457 *Sci. Total Environ.* 246 (2013).

<sup>75</sup> Anja Coors et al., *Removal of Estrogenic Activity from Municipal Waste Landfill Leachate Assessed with a Bioassay Based on Reporter Gene Expression*, 37 *Envtl. Science. Tech.* 3430, 3430-3434 (2003); C.E.J.R. Desbrow et al., *Identification of Estrogenic Chemicals in STW effluent. 1. Chemical Fractionation and in vitro Biological Screening*, 32 *Envtl. Science. Tech.* 1549, 1549-1558 (1998); Peter Splenger et al., *Substances with Estrogenic Activity in Effluents of Sewage Treatment Plants in Southwestern Germany. 2. Biological Analysis*, 20 *Soc'y of Envtl. Toxicology Chemistry* 2133, 2133-2141 (2001).

<sup>76</sup> Hilda Hatzell, *Effects of Waste-disposal Practices on Ground-water Quality at Five Poultry (Broiler) Farms in North-central Florida, 1992-93*. Water-Res. Investigation Rep. No. 95-4064, U.S. Dept. of the Interior, U.S. Geological Surv. (1995); Lee M. Myers et al. *Impact of Poultry Mortality Pits on Farm Groundwater Quality*, Ga. Inst. of Tech. (1999); William Ritter & A. E. M. Chirnside, *Impact of Dead Bird Disposal Pits on Ground-water Quality on the Delmarva Peninsula*, 53 *Bioresour Tech* 105, 105-111 (1995).

<sup>77</sup> Qi Yuan et al., *supra* n. 74.

<sup>78</sup> Gordon Nichols, *Fly Transmission of Campylobacter*, 11 *Emerg. Infect. Dis.* 361, 361-364 (2005); Dana Cole et al., *Free-living Canada Geese and Antimicrobial Resistance*, 11 *Emerg. Infect. Dis.* 935, 935-938 (2005); D.J. Hanzler & H.M. Opitz, *The Role of Mice in the Epizootiology of Salmonella Enteritidis Infection on Chicken Layer Farms*, 36 *Avian Diseases* 625, 625-631 (1992).

<sup>79</sup> Ellen Silbergeld et al., *Industrial Food Animal Production, Antimicrobial Resistance, and Human Health*, 29 *Annu. Rev. Public Health* 151, 151-169 (2008).

pathogens into nearby communities and may lead to the development of antibiotic-resistant bacteria.<sup>80</sup>

We urge DEQ to impose groundwater-monitoring requirements near burial sites, as discussed below. Hurricane Florence recently caused the deaths of more than 5,500 hogs, nearly double the number killed during Hurricane Matthew.<sup>81</sup> Given the increasing frequency and intensity of extreme weather events due to climate change,<sup>82</sup> severe storms and mass mortalities are likely to continue in the future.

Operators likely require more than 24 hours to develop an appropriate plan for managing mass mortalities. During Florence, high levels of precipitation and flooding continued long after initial hog deaths occurred. As a result, operators who planned to bury dead animals were likely unprepared to take prompt and responsible action, since burying dead animals in flooded soil directly contributes to release of pollutants into groundwater.

To protect public health and the environment, DEQ should work with the State Vet pursuant to its authority under N.C. Gen. Stat. 106-403 to prohibit mass burials during rainfall events and within floodplains. In addition, DEQ should increase the minimum distance of the burial site to the nearest groundwater well to a quarter mile (1,320 feet).<sup>83</sup> Information about mortalities should be added to the annual certification form. Additional challenges associated with mass burial should be addressed on a case-by-case basis.<sup>84</sup>

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<sup>80</sup> Julia R. Barrett, *Airborne Bacteria in CAFOs: Transfer of Resistance from Animals to Humans*, 113 *Envtl. Health Persp.* A116, A116-A117 (2005); Mary J. Gilchrist et al., *The Potential Role of Concentrated Animal Feeding Operations in Infectious Disease Epidemics and Antibiotic Resistance*, 115 *Envtl. Health Persp.* (2007).

<sup>81</sup> Tom Polansek, *Hog Deaths, Manure Flooding from Florence Seen Surpassing 2016 Hurricane*, Reuters (Sept. 18, 2018), <https://www.reuters.com/article/us-storm-florence-hogs/hog-deaths-manure-flooding-from-florence-seen-surpassing-2016-hurricane-idUSKCN1LY36W>

<sup>82</sup> Cynthia Rosenzweig et al., *Climate Change and Extreme Weather Events; Implications for Food Production, Plant Diseases, and Pests*, 2 *Global Change & Human Health* 89, 89-104 (2001).

<sup>83</sup> The Washington State General Permit prohibits natural decomposition within 1,320 feet or less from any groundwater well, spring, sinkhole, or body of surface water, and in an area that has a seasonally high water table, seasonal floods, or within a hundred-year floodplain. We urge DEQ to implement similar restrictions on mass burial during a catastrophic mortality event to prevent environmental and health harms. See Wash. State Dept. of Ecology, *Response to Comments for the Concentrated Animal Feeding Operation National Pollutant Discharge Elimination System and State Waste Discharge General Permit and Concentrated Animal Feeding Operation State Waste Discharge General Permit*, 47 (Jan. 18, 2017), available at: <https://ecology.wa.gov/DOE/files/5f/5f39ec9a-7687-442e-b8fi-1376baza4687.pdf>.

<sup>84</sup> *Id.*



## Condition II.19: Application of Waste in Wind Conditions

We applaud DEQ's decision to prohibit facilities from applying waste in wind conditions that cause or might reasonably be expected to cause waste to reach surface waters or wetlands or cross boundary lines or field boundaries. The Draft Permit provides an objective standard for land application and clarifies that operators are responsible for ensuring that waste does not in fact reach surface waters or wetlands or cross property lines or field boundaries. This provision is particularly important because certain wind conditions can carry mist containing disease-causing agents into vulnerable ecosystems, including surface waters and wetlands, and across property lines threatening human health.

Livestock waste contains harmful bacteria, viruses, and other pathogens that can infect humans and cause serious illness. In CAFO waste slurries, these disease-causing microbes can survive for weeks at a time.<sup>85</sup> Surface applications of bacteria-rich wastes to nearby fields are imprecise, leading to deposition of fecal matter and associated microbes and contaminants downstream. In the days following applications, harmful microbes have been detected in groundwater and streams far from the site of application.<sup>86</sup> The area of potential exposure is much larger than the immediate area surrounding the site of application.

People living and working near application sites suffer exposure to these microbes and pollutants for extended periods, putting them at higher risk of health complications. Researchers have found swine fecal particles inside residential homes located near swine facilities in eastern North Carolina.<sup>87</sup> Contact with and consumption of food in contact with fecal particles containing bacteria and viruses can lead to infections. Wind-dispersed ammonia and the associated odor also pose significant threats to human health and wellbeing, causing symptoms that include headaches, nausea, hives, anxiety, irritated and dry eyes and throat, and depression.<sup>88</sup> Requiring facilities to limit and prevent spreading of airborne fecal matter and pollutants from spray mist is crucial to protect community health.

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<sup>85</sup> Jane L. Mawdsley et al., *Pathogens in Livestock Waste, Their Potential for Movement Through Soil and Environmental Pollution*, 2 *Applied Soil Ecology* 1, 1-15 (1995).

<sup>86</sup> Stuart R. Crane et al., *Bacterial Pollution From Agricultural Sources: A Review*, 26 *Transactions of the American Society of Agricultural Engineers* 858, 858-866 (1983); Jane L. Mawdsley et al., *Pathogens in Livestock Waste, Their Potential for Movement Through Soil and Environmental Pollution*, 2 *Applied Soil Ecology* 1, 1-15 (1995); see Mallin, *supra* n.69.

<sup>87</sup> Expert Report of Shane Rogers, Ex. 6 to Resp. in Opp'n to Mot. Partial Summ. J., *In re: NC Swine Farm Nuisance Litigation*, No. 5:15-cv-00013-BR 62-72 (E.D.N.C. May 5, 2017), ECF No. 330-6.

<sup>88</sup> U.S. EPA, *Managing Manure Nutrients at Concentrated Animal Feeding Operations* 64 (2004), [https://www3.epa.gov/npdes/pubs/cafo\\_manure\\_guidance.pdf](https://www3.epa.gov/npdes/pubs/cafo_manure_guidance.pdf); Susan S. Schiffman, *Livestock Odors: Implications for Human Health and Well-Being*, 76 *J. Animal Sci.* 1,343, 1,343 (1998).

### **Condition II.23: Ceasing land application after storm warnings/watches**

The Draft Permit expands land application up to 12 hours after storm watches and warnings, rather than four hours as in the stakeholder draft permit and the current permit. We oppose this change and urge the Department to revert to the original 4-hour window after which to cease land application following issuance of a National Weather Service (NWS) Hurricane Warning, Tropical Storm Warning, or a Flood Watch/Flash Flood Watch. It appears that the window was expanded from 4 to 12 hours at the swine industry's request, based only on industry's unsubstantiated claim that the NWS has begun issuing warnings and watches 36 hours in advance of a storm's arrival. This condition must ensure that waste has enough time to incorporate into the soil before precipitation in order to prevent waste from entering storm runoff from fields. Given the increasing intensity and severity of storms and rainfall, and the overwhelming impacts from flooding from Hurricanes Matthew and Florence in 2018, any reduction in the amount of time that sprayed waste can be absorbed by crops before a significant rain event is unconscionable and ignores scientific climate evidence described in our comments on Condition I.1. above. While storm watches and warnings might now be issued 36 rather than 24 hours in advance, this is not necessarily always the case, as the National Weather Service says warnings are "generally within 36 hours" and "are expected within 36 hours."<sup>89</sup> Requiring cessation of land application within 4 hours of the NWS watch or warning is a critical safeguard to prevent runoff and discharge. This change should be reversed.

### **Conditions II.18, II.24, III.2, and III.3: Requirements for Installation of Automated Technology**

In North Carolina, antiquated, lower-tech systems for managing swine waste continually lead to permit violations that jeopardize public health and environmental quality. Automated technology that is affordable and widely available could help address these pervasive and severe violations.

We again encourage DEQ to plan now for the transition to more sustainable alternatives to the lagoon and sprayfield system. While the agency continues authorizing the use of the lagoon and sprayfield system, however, we support new language in Conditions II.18, III.2.c., and III.3 clarifying when the Division will use its authority to require automatic flow monitoring equipment, automated waste-level monitors and recorders, and automated rain gauges and recorders are necessary, though these provisions don't go far enough. The permit should require that all Permittees install these devices, instead of requiring them only on a case-by-case basis. Mandatory installation of these three kinds of devices would improve Permittees' ability to comply with several permit provisions. Automatic flow meters improve the quality of recordkeeping and calculations needed for proper maintenance of lagoons and sprayfields. Automated waste-level monitors and recorders enable Permittees to monitor and record lagoon waste levels with greater accuracy and consistency. The increasing frequency of severe weather events makes the use of these devices all the more important, since they enable data collection during storms, when it is most crucial. Similarly, automatic rain gauges are a simple, inexpensive

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<sup>89</sup> Hurricane and Tropical Storm Watches, Warnings, Advisories and Outlooks, <https://www.weather.gov/safety/hurricane-ww> (last visited Feb 19, 2019).

way to improve the accuracy of records of precipitation events. These devices leave less room for human error and intentional non-compliance from self-monitoring and self-reporting.

At minimum, if installation of automatic flow monitoring equipment, automated waste-level monitors and recorders, and automated rain gauges and recorders continues to be on a case-by-case basis, the permit should state that circumstances beyond those explicitly listed in these conditions can lead DEQ to require these technologies. Language should be added to Conditions II.18, III.2, and III.3 to make clear that devices can be required as deemed necessary by the Director.

Furthermore, Condition II.24 should be modified to require that all Permittees install devices to stop irrigation during precipitation events. We are opposed to Permittees being given the choice between installing automated equipment and committing to the presence of an Operator in Charge (OIC) during land application of waste. These two options do not provide equivalent protections, since the written commitment to have an OIC present does not address the possibility for willful noncompliance. It is already a permit violation to land apply waste during precipitation events. Under the current permit, Permittees already have an obligation to avoid this practice and the OICs, their backups, or someone under their supervision is already required to inspect “the land application site as often as necessary to insure that the animal waste is land applied in accordance with the CAWMP.”<sup>90</sup> This human element has proven repeatedly inadequate to prevent violation of the permit. Requiring installation of devices to automate compliance for all Permittees would help combat violations of the prohibition on land application during precipitation, which have been widely observed by Waterkeeper Alliance and community members. In addition, for those Permittees who elect to or are required to install these devices, they should be required to complete installation within six months, instead of 12 months. This shorter timeframe would ensure that devices to stop irrigation during precipitation events would be in place prior to the hurricane season of 2020. It is bad enough that the industry will enter the 2019 hurricane season without such technology in place.

In addition, all Permittees should be required to notify DWR in writing when devices covered by Conditions II.18, II.24, III.2, and III.3 have been installed. Finally, Condition II.18 on flow monitoring equipment should contain language similar that in Conditions II.24, III.2, and III.3 requiring that devices be properly maintained in line with the manufacturer’s instructions and warranties.

### **Condition II.28: Crop Removal**

Although we support the effort to clarify crop removal requirement, 24 months is far too long to adequately protect against decomposition and the return of nutrients into the soil. As discussed below, we support a more reasonable time-frame for the removal of hay bales (either in the form of actual removal or, absent a reasonably short time frame for actual removal, then for proper storage) on/near CAWMP fields.<sup>91</sup>

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<sup>90</sup> Permit AWG 100000, II.17.

<sup>91</sup> See *e.g.*, N.C.G.S. § 143-215.10B(c)(7) (2014) (requiring waste management plans regarding waste utilization that “assure a balance between nitrogen application rates and nitrogen crop requirements”).

## *Timeline for Harvesting*

Allowing cut crops to lie on the land results in decomposition. As crop residues decompose, nitrogen and phosphorus are released back into the soil through N mineralization and then nitrification, becoming available for leaching in the process.<sup>92</sup> Crops and soil conditions found in eastern North Carolina where the highest concentration of these operation are located lend themselves to increased N mineralization of decomposing crop residues.<sup>93</sup> In the 24 months that the current provision language allows crop residues to remain after cutting, significant amounts of nitrogen and phosphorus once stored in crops will leave the decomposing plant residues and return to the soil in a leachable form.<sup>94</sup> If the objective of applying waste to crops is to take up nutrients from the soil to prevent leaching and to remove these nutrients from the system, this

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<sup>92</sup> Deanna Osmond & Jihoon Kang, *Nutrient Removal by Crops in North Carolina* (2008), [https://content.ces.ncsu.edu/static/publication/js/pdf\\_js/web/viewer.html?slug=nutrient-removal-by-crops-in-north-carolina](https://content.ces.ncsu.edu/static/publication/js/pdf_js/web/viewer.html?slug=nutrient-removal-by-crops-in-north-carolina) (last visited Feb 20, 2019) (“Nutrients in plants that are left in the field will partially resupply nutrient reserves in the soil as they decompose...Estimates of nutrient depletion, therefore, should take into account only the nutrients removed with the harvest portion of the plant.”); Deanna Osmond, *Nitrogen Management and Water Quality* (2017), [https://content.ces.ncsu.edu/nitrogen-management-and-water-quality#section\\_heading\\_10566](https://content.ces.ncsu.edu/nitrogen-management-and-water-quality#section_heading_10566) (last visited Feb 20, 2019) (depending on the crop, N may temporarily be immobilized by microbial activity for a period, but eventually N mineralization frees up N from microbial biomass. Mineralized N becomes available to plants for uptake or to leaching through nitrification or, particularly in areas with high-water-table soils, enters the atmosphere as gaseous nitrous oxide (a greenhouse gas) through denitrification. P in crop residues is mostly in forms already bioavailable to plants and will likely join the soil solution or become adsorbed to soil particles upon decomposition from crop residues; P in the soil solution or adsorbed to soil particles is available for leaching or loss to water through erosion).

<sup>93</sup> Baoqing Chen et al., *Soil Nitrogen Dynamics and Crop Residues. A review*, 34 *Agron. Sustain. Dev.* 429–442 (2014) (N mineralization, and therefore the risk of leaching, is impacted by crop composition and soil type. Even during decomposition of crops like hay with high C:N ratios, microbes might at first immobilize N, but decomposition process eventually lead to a net N mobilization for these crop residues); T. M. Egelkraut, D. E. Kissel & M. L. Cabrera, *Effect of Soil Texture on Nitrogen Mineralized from Cotton Residues and Compost*, 29 *J. of Envntl Quality*; Madison 1518 (2000) (sandier soils like those in eastern North Carolina mineralize more N than soils comprised of higher percentages of silt and clay, possibly because sandy soils have less aggregate protection of decomposing organic matter, freeing up more of the crop residues to decomposition and, consequently, N mineralization and leaching).

<sup>94</sup> I. K. Thomsen et al., *Net Mineralization of Soil N and <sup>15</sup>N-ryegrass Residues in Differently Textured Soils of Similar Mineralogical Composition*, 33 *Soil Biology and Biochemistry* 277–285 (2001) (N mineralization of decomposing crop residues can begin on day one of cutting and contact with the soil and continue, though at a decreasing rate, until the residues are completely decomposed. Ryegrass decomposition studies show continued N mineralization during the entire study period of seven months, at which time, as much as 36% of N from the ryegrass residues was recovered in the soil as mineral N); H. Shindo & T. Nishio, *Immobilization and Remineralization of N Following Addition of Wheat Straw into Soil: Determination of Gross N Transformation Rates by <sup>15</sup>N-ammonium Isotope Dilution Technique*, 3 *Soil Biology and Biochemistry* 425–432 (2005) (wheat straw decomposition can transition from immobilization to mineralization in a matter of weeks, if not sooner. The N remineralisation rates of wheat straw have been documented at 0.71, 0.55 and 0.29 mg N kg<sup>-1</sup> day<sup>-1</sup> after 7, 28 and 54 days, respectively—indicating a faster rate of return occurs in the first week).

provision should be amended to clarify that the harvest of cut residues must be completed within 1 to 2 weeks.<sup>95</sup>

A more appropriate time frame in which to harvest cut crops would be 1-2 weeks, and not more than 6 months.<sup>96</sup> The shorter time period would also improve hay and silage quality. Most growers harvest and remove hay and other feed crops after cutting within a week, if not much sooner.<sup>97</sup> Furthermore, research from USDA Extension programs advocates for “Haylage in a Day” practices that consolidate cutting, drying, and removal steps within a single day to allow for enough drying out time to avoid rot while maximizing the amount of total digestible nutrients in the hay or silage.<sup>98</sup>

### ***Timeline for Removal after Harvesting***

Once crops on land application sites have been harvested, they should be removed from contact with the land and, if kept onsite, stored in such a way that minimizes the chance of decomposition and return of nutrients to the soil in order to guarantee compliance with the CAWMP. At a minimum, this Condition should clarify that if harvested crops are not physically removed from the land application site then operators must remove harvested crops from contact with the ground when stored on the land application site. The same timeframes for decomposition of crop residues described above applies to harvested crops. Therefore, crops should be removed according to the definition described above within 1-2 weeks of harvest, and at the very least no later than 6 months after harvest. Again, this timeline is reasonable, as most growers now cut, harvest, and remove their hay all in a week, if not in a day.

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<sup>95</sup> A. P. Schaffers, M. C. Vesseur & K. V. Sykora, *Effects of Delayed Hay Removal on the Nutrient Balance of Roadside Plant Communities*, 35 J. of Applied Ecology 349–364 (1998) (studies examining the loss of nutrients from cut hay left at the soil surface demonstrate that a substantial proportion of N and P is lost from decomposing plant matter in just a few weeks; after 6 weeks, more P is lost than N); Mahbubeh Zarabi & Mohsen Jalai, *Rate of Nitrate and Ammonium Release From Organic Residues*, 20 Compost Science & Utilization; Abingdon 222–229 (2012) (studies of other types of crop residues similarly found a rapid initial nutrient loss in the first one to five weeks of decomposition, followed by a continued but slower rate of nutrient loss).

<sup>96</sup> Chen et al., *supra* n. 93 (of crop residues researched, all crop residues leading to immediate N mineralization or net N mineralization were studied in less than six months); G. Maltais-landry & E. Frossard, *Similar Phosphorus Transfer from Cover Crop Residues and Water-soluble Mineral Fertilizer to Soils and a Subsequent Crop*, 393 Plant and Soil 193–205 (2015) (the vast literature investigating the fate of N and P during decomposition processes predominantly span just 2-6 months, during which time decomposition processes occur most rapidly with significant initial nutrient losses).

<sup>97</sup> Schaffers, Vesseur, and Sykora, *supra* n. 95.

<sup>98</sup> Paul Craig, *Haylage in a Day Penn State Extension* (2016), <https://extension.psu.edu/haylage-in-a-day> (last visited Feb 20, 2019); Matthew Digman et al., *Best Practices to Hasten Field Drying of Grasses and Alfalfa* 8 (2011).

### ***Conditions for Proper Removal via Onsite Storage***

The closer in contact soil particles and plant residues are, the faster decomposition occurs.<sup>99</sup> The optimal conditions for decomposition are high water content, small residue size with high surface area for soil contact, and high temperatures. Therefore, to minimize the chance of returning nutrients to the soil—and to improve the quality of stored hay—the permit provision should specify the conditions for storing hay as a form of “removal” after it has been cut and harvested from the land application site.

Hay exposed to moisture and/or sunlight will decompose faster. Contact between hay and soil is the most critical aspect of hay decomposition and spoilage and should be eliminated.<sup>100</sup> Bales stored outside, exposed to the elements, on the ground and without a cover can see a sharp increase in moisture content, as much as 120% for the outer 3 inches, which can speed up weathering and decomposition of the hay.<sup>101</sup> In areas of high precipitation or humidity, improper storage can lead to greater than 50% loss of dry matter, which is detrimental to forage quality and efforts to prevent leaching.<sup>102</sup> Over the course of just several months, storing bales outside unprotected in the eastern United States can lead to decomposition and extensive and costly loss of feeding value for at least the outer 5-6 inches of hay, with greater losses at the bottom of bales due to contact with the soil.<sup>103</sup>

To avoid speeding up decomposition, the permit should require that hay be stored either 1) offsite or 2) if onsite, on pallets, pads 4-8 inches deep of rocks 1-3 inches in diameter, concrete, or some other base to raise the hay off of bare ground; securely covered as a group or as individual bales with a woolen blanket, flannelette sheet, plastic sheeting at least 6 mil. thick, net wrap, tarp, or other cover that protects bales from moisture while ideally letting the hay breathe; and in high density bales of at least 10 pounds per cubic foot if a round bale. Even bales individually wrapped in covers should not be stored directly on the ground.<sup>104</sup> Bales stored outside in rows should run up and down well-drained, gentle slopes to avoid trapping water, should be stored with ends of bales butted tightly together, and should have at least three feet between the rows.<sup>105</sup> These conditions are in line with best storage practices for preserving hay and silage quality and are widely recommended by extension agencies and industry entities to improve crop quality during storage.<sup>106</sup>

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<sup>99</sup> S. J. Giacomini et al., *Simulating the Effects of N Availability, straw Particle Size and Location in Soil on C and N Mineralization*, 301 *Plant and Soil*; Dordrecht 289-301 (2007).

<sup>100</sup> Don Ball et al., *Minimizing Losses in Hay Storage and Feeding*, <https://extension.msstate.edu/sites/default/files/topic-files/beef-publications/beef-publications-landing-page/minhaylosses.pdf> (last visited Feb 24, 2019).

<sup>101</sup> *Id.*

<sup>102</sup> *Id.*

<sup>103</sup> *Id.*

<sup>104</sup> *Id.*

<sup>105</sup> *Id.*

<sup>106</sup> William Edwards, *Hay Storage Options: How do They Stack Up?*, *Farm Progress* (2017), <https://www.farmprogress.com/forage/hay-storage-options-how-do-they-stack> (last visited Feb 24, 2019); Ball et al., *supra* n.100; Brian Holmes, *Dry Round Hay Bale Storage Costs* 3 (2004),

In addition to these criteria for any storage on site, the permit should set a limit for how long bales can be stored onsite. Even with the best practices described above, nutrient loss from bales stored for 12-18 months can be double that of bales stored for less than 9 months.<sup>107</sup> Therefore, this permit should limit onsite storage of hay bales to a maximum of one year.

### **Condition III.2, 3b: Criteria for Monitoring and Recording Waste Levels**

We urge DEQ to make automated monitoring/recording of waste levels mandatory for all facilities, instead of requiring it on a “case by case” basis. Given the increase in extreme weather events due to climate change, the accuracy and precision of waste levels are increasingly important and time-sensitive. Automatic monitors make information available when it matters most. They are also more accurate and can store data, which can simplify the Permittee’s job, while providing an accurate record at relatively low cost.

We appreciate the Division’s removal of the freeboard violation pre-condition from III.2(c) as a step in the right direction. We note what appears to be an inadvertent failure to delete this sentence from III.2(c): “The Director may determine that installation of automated waste level monitors is not required if the Permittee can demonstrate that preventative measures were taken to avoid the violations and that the violations resulted from conditions beyond the Permittee’s control.” Because of the elimination of the freeboard violation requirement, this sentence makes no sense here.

### **Condition III.8: Mortality Records**

Increasing the regularity of recordkeeping from monthly to weekly is an important step towards more effective oversight and, when necessary, investigation relating to the mortality and disposal of animals. The particular odors, vermin, pestilence, and other adverse impacts from the collection and disposal of dead hogs continue to be a central element in complaints from residents and were raised in the Title VI complaint.<sup>108</sup> Additionally, this increased oversight of animal mortality at permitted facilities is consistent with DEQ’s new provisions in Condition II.10 regarding disposal of dead animals, which incorporate specific record-keeping and reporting requirements, and help improve oversight and transparency.

### **Condition III.9(f): Waste Samples Following Discharge**

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<https://fyi.extension.wisc.edu/forage/dry-round-hay-bale-storage-costs/>; Raymond Huhnke, *Round Bale Hay Storage*, <http://pods.dasnr.okstate.edu/docushare/dsweb/Get/Rendition-6342/BAE-1716web.pdf> (last visited Feb 24, 2019); Bob Schultheis, *Hay Storage & Feeding Management* (2013), [http://extension.missouri.edu/webster/documents/presentations/2013-03-28\\_RegionalHaySchool/2013-03-29\\_Hay\\_Storage\\_and\\_Feeding\\_Management-BobSchultheis-screen.pdf](http://extension.missouri.edu/webster/documents/presentations/2013-03-28_RegionalHaySchool/2013-03-29_Hay_Storage_and_Feeding_Management-BobSchultheis-screen.pdf); N.C. Cooperative Extension, *Hay Storage and Feeding Losses* (2018), <https://duplin.ces.ncsu.edu/2018/04/hay-storage-and-feeding-losses/> (last visited Feb 27, 2019).

<sup>107</sup> Huhnke, *supra* n.106.

<sup>108</sup> See Exh. 2, at 16, 23, 30.

This Draft inexplicably deletes the provision requiring facilities to obtain waste samples within 48 hours after first knowledge of a discharge from a lagoon to surface waters.<sup>109</sup> This provision needs to be restored, as it is fundamental to ensuring accountability and transparency to the public, as well as to securing accurate and timely data regarding the potential impact of any discharge, which becomes more difficult to assess if sampling is delayed. During the stakeholder process, industry representatives objected to requiring sampling within 48 instead of 72 hours on the grounds that labs are not open on weekends. We requested sampling happen within 24 hours of knowledge of discharge.

### **Condition III.10-III.14: Groundwater Monitoring**

These provisions reaffirm the Division’s existing regulatory authority to require a Permittee to undertake any necessary monitoring and reporting to protect surface water, groundwater, and wetlands. By its express terms, this provision requires individualized assessment and provides an important “first-line” of defense from any actual or potential adverse off-site impacts of permitted operations. The Division must retain the full range and scope of potential monitoring and reporting requirements, since this provision is designed to identify possible impacts, and any necessary monitoring, testing, or mitigation, as early as possible.

#### ***Support for Groundwater Monitoring in the 100-year Floodplain***

We strongly support the additional provisions in Condition III.10-III.11 that require on-site groundwater monitoring at facilities with structures in the 100-year floodplain. The high-water table, low organic matter content, and sandy nature of these soils create conditions in which lagoon pits and spray field manure applications can leach nitrogen, phosphorus, and bacteria into groundwater and surface waterways. Studies have repeatedly found elevated nutrient levels below spray fields and downstream from lagoons in North Carolina, not just in the 100-year floodplain.<sup>110</sup> North Carolina watersheds with CAFOs have significantly higher concentrations of ammonium, nitrate, and total N than those without CAFOs.<sup>111</sup>

Facilities operating in the 100-year floodplain are more vulnerable to the risks of groundwater contamination due to flooding and high water tables. The Legislature recognized this risk in 1995, when it passed N.C. Gen. Stat. § 106-802(a2), prohibiting construction of new animal waste management systems in the 100-year floodplain, and again in 2007 when it amended N.C. Gen. Stat. § 143-215.10I to establish superior technology performance criteria and the Lagoon Conversion Program which came with significant financial investment.<sup>112</sup> In the last two decades, the risks associated with operating a facility in the 100-year floodplain have only increased. In

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<sup>109</sup> See Draft Swine Waste Management System General Permit for Stakeholder Process, III.9(f)(48 hour standard); Swine Waste Management Permit (2014), III.9(f) (72 hour standard).

<sup>110</sup> Michael A. Mallin et al., *Industrial Swine and Poultry Production Causes Chronic Nutrient and Fecal Microbial Stream Pollution*, 226 *Water, Air and Soil Pollution*; Dordrecht 1–13 (2015).

<sup>111</sup> Stephen Harden, *Surface-Water Quality in Agricultural Watersheds of the North Carolina Coastal Plain Associated with Concentrated Animal Feeding Operations* (2015).

<sup>112</sup> To date, nearly \$19 million in funds allocated by the North Carolina General Assembly has been spent in the Lagoon Conversion Program. See David Williams, Deputy Director, Division of Soil & Water Conservation, *Overview: 100-Year Floodplain Swine Buyout*, December 1, 2016.



light of climate change and more intense and frequent severe weather, CAFO operations in the 100-year floodplain are even more vulnerable to flooding and the surrounding area will be more at risk of groundwater and surface water contamination.<sup>113</sup>

### ***Conditions to Trigger Groundwater Monitoring Outside of the 100-year Floodplain***

The groundwater monitoring proposals in this Condition are a necessary step toward improved monitoring and enforcement to support the health and well-being of North Carolinians. However, the permit should specify additional key conditions that will trigger groundwater monitoring of facilities outside the 100-year floodplain, and these triggers should target the CAFOs most at risk of polluting and the areas most at risk of being polluted. Such triggers should include the following:

1. *Operations that employ burial as a mortality management strategy* – We applaud that this permit disfavors burial of mortalities, discussed above regarding Condition II.10. If facilities are still using burial, they should monitor groundwater for relevant contaminants. Livestock burial sites produce leachate that can contaminate groundwater, especially in areas with elevated water tables and sandy soils.<sup>114</sup> Complete decomposition of animal carcasses can take two years, and even as long as ten years depending on environmental conditions.<sup>115</sup> During the period of decomposition, animal carcasses can release greenhouse gases and leachates containing high levels of chemical contaminants including high electrical conductivity, turbidity, biochemical oxygen demand, ammonium-nitrogen, total dissolved solids, and Cl<sup>-</sup> and SO<sub>4</sub><sup>2-</sup> concentrations.<sup>116</sup> Elevated chloride levels in particular are good indicators of burial-related groundwater contamination. Burial sites can also lead to groundwater contamination from pathogens and bacteria including fecal coliform, *C. perfringens*, and, especially, *E. coli*.<sup>117</sup> Additionally, bacteria like sulfate-reducing bacteria can also serve as indicators of groundwater contamination from livestock burial sites.<sup>118</sup> Lastly, antibiotics are also likely present in the leachate from decomposing carcasses.<sup>119</sup>
2. *Scale and environmental context of a facility* – Studies indicate that the concentration of facilities in a given area, the amount of area covered by wetlands, and the amount of land under a sprayfield system together correlate with measurable effects of CAFO waste

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<sup>113</sup> See also Exh.2, at 40.

<sup>114</sup> Ron Fleming & Rachel Freedman, *Water Quality Impacts of Burying Livestock Mortalities* (2003), [https://www.ridgetownc.com/research/documents/fleming\\_carcassburial.pdf](https://www.ridgetownc.com/research/documents/fleming_carcassburial.pdf).

<sup>115</sup> *Id.*

<sup>116</sup> *Id.*; Man Jae Kwon et al., *Impacts of Leachates from Livestock Carcass Burial and Manure Heap Sites on Groundwater Geochemistry and Microbial Community Structure*, 12 PLOS One e0182579 (2017); T. D. Glanville et al., *Soil Contamination Caused by Emergency Bio-Reduction of Catastrophic Livestock Mortalities*, 198 Water, Air and Soil Pollution; Dordrecht 285–295 (2009).

<sup>117</sup> Ha Kyung Joung et al., *Nationwide Surveillance for Pathogenic Microorganisms in Groundwater near Carcass Burials Constructed in South Korea in 2010*, 10 Int. J. Environ Res. Public Health; Basel 7126–43 (2013).

<sup>118</sup> Kwon et al., *supra* n.116.

<sup>119</sup> Geon-ha Kim & Sudipta Pramanik, *Biosecurity procedures for the environmental management of carcasses burial sites in Korea*, 38 Environmental Geochemistry and Health; Kew 1229–1240 (2016).

manures on surface water quality. In the shallow aquifer system of the North Carolina Coastal Plain, groundwater discharge to receiving streams contributes about 50-60 percent of the annual stream flow in the region.<sup>120</sup> Therefore, not only do the findings of groundwater studies bear weight in considering the impacts of CAFOs on groundwater quality, surface water studies in the region hold relevance, as well, as proxy indicators of groundwater quality. Watersheds with lower percentages of wetlands and higher swine barn densities and/or higher total acres of land application area have the most significant measurable impacts on surface water quality.<sup>121</sup> Therefore, groundwater-monitoring requirements should be triggered in watersheds with 1) a high concentration of CAFOs or a high amount of land area sprayed with animal waste *and* 2) a low percentage of wetland area.<sup>122</sup> This requirement should be triggered by a facility's proximity to a community of concern, discussed above at 7-8.

3. Lagoons with a bottom elevation less than a minimum of 2 feet above the seasonal high water table – These facilities are not compliant with the Natural Resources Conservation Service Waste Storage Facility Pond Criteria (313-Practice Standard), which requires that all ponds have a bottom elevation that is a minimum of 2 feet above the seasonal high water table.<sup>123</sup> Such lagoons are more at risk of leaching of nutrients and bacteria with little barrier between the waste they contain and the shallow aquifer systems in the Coastal Plains.<sup>124</sup> Therefore, triggering monitoring for these facilities would ensure that their operations are not endangering the health of communities who depend on water downstream for drinking water.
4. Facilities upstream from drinking water sources – Given the abundance of scientific evidence that waterways in watersheds dense with CAFOs have measurable negative nutrient and bacterial characteristics resulting from CAFO operations, facilities operating in close proximity upstream from drinking water sources should have to monitor their impacts on water quality.<sup>125</sup>
5. Non-compliance history – As directed by NC Gen Stat § 143-215.6E (2014), the North Carolina Environmental Management Commission under DEQ has the authority and obligation to develop a Violation Point System applicable to permits for animal waste management systems for swine farms that monitors permit violations and considers the relative threat of each violation to groundwater and surface water quality, public health,

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<sup>120</sup> Harden, *supra* n. 111.

<sup>121</sup> *Id.*

<sup>122</sup> *Id.* DEQ could readily operationalize these standards by adopting a groundwater monitoring trigger for facilities in watersheds with 1) less than 14% wetland cover and 2) greater than 3 barns/mile or 52 total acres to which swine waste is applied.

<sup>123</sup> See NRCS, NHCP, Conservation Practice Standard No. 313, *Waste Storage Facility 3* (May 2016), [https://www.nrcs.usda.gov/Internet/FSE\\_DOCUMENTS/nrcs143\\_026465.pdf](https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs143_026465.pdf).

<sup>124</sup> R. Hermanson et al., *Nitrogen Use by Crops and the Fate of Nitrogen in the Soil and Vadose Zone – A Literature Search*, Pub. No. 00-10-015 at 131 (2000), <https://fortress.wa.gov/ecy/publications/SummaryPages/0010015.html>.

<sup>125</sup> See *supra* n. 110-111.

and environment.<sup>126</sup> Violations that harm one of these three factors “shall receive the most points and shall be considered significant violations.”

In the May 2018 settlement, DEQ agreed to draft a proposed implementation rule for the Violation Points System by May 3, 2019.<sup>127</sup> Consistent with a Violation Points System, this permit should require facilities with more than one significant permit violation or a certain number of violation points in the permit timeframe to monitor their facilities for the duration of the permit according to the standards in this Draft Permit.<sup>128</sup> Facilities that have non-compliance issues and acquire a high number of violation points have an elevated risk of contaminating groundwater as the conditions of this Draft Permit and, eventually, the point system are in place to protect environmental quality. Violating these regulations, therefore, is accompanied by an increased risk of negative impacts on environmental and water quality. Monitoring groundwater quality provides an avenue for protecting human health near non-compliant facilities and ensuring a transition to robust compliance.

6. Documented impacts on groundwater quality – DEQ should require groundwater monitoring at facilities where there is documentation that operations have impaired groundwater. At minimum, this permit should retain language proposed in the stakeholder process requiring groundwater monitoring “when any of the following conditions exist, including but not limited to: a. evidence that groundwater impacts to public or private water wells are occurring off-site; b. evidence of migration of contaminated groundwater to off-site property or properties; c. evidence of surface water impacts via groundwater.”<sup>129</sup>

For the Violation Points System to yield its intended results, DEQ must detect and enforce non-compliance issues negatively impacting water, health, and environmental quality. Of the 177 violations found during FY 2017-18, only 20 resulted in the initiation of an enforcement action.<sup>130</sup> Unpermitted discharges from the systems and evidence of over application were two of the three most common violations, both of which can degrade groundwater quality. The Wilmington Regional Office staff only had the capacity to spend an average of 56 minutes on each inspection, which is insufficient given the necessary inspection components. In light of DEQ’s stretched capacity for enforcement and recent

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<sup>126</sup> See 15A NCAC 02T.0120(a) (“The Division shall consider an applicant’s compliance history in accordance with G.S. 143-215.1(b)(4)b.2 and with the requirements contained in this Rule for environmental permits and certifications issued pursuant to Article 21.”).

<sup>127</sup> See Exh. 5 at 5.

<sup>128</sup> Groundwater monitoring should be tied to significant violations, see GS 143.215.6E(a)(1) (“violations that involve the greatest harm to ... groundwater”), as well as the accumulation of lesser violations that heighten the risk to groundwater resources.

<sup>129</sup> Draft Swine Waste Management System General Permit for Stakeholder Process, III.10.

<sup>130</sup> Dept. of Env’tl. Quality, *supra* n.51.

budget cuts,<sup>131</sup> in the event that a third party can demonstrate acceptable evidence of offsite impact on groundwater quality, groundwater monitoring should be triggered. The Division should always assess the credibility of evidence of groundwater contamination, but when credible evidence is presented, it should be considered regardless of who presents it. Additionally, absent comprehensive groundwater monitoring by the regulating agency, the evidence necessary to trigger groundwater monitoring will be impossible to obtain unless rigorous, credible third-party evidence collected via approved sampling protocols is accepted.

7. Covered Lagoons/Digesters –N.C. Gen. Stat. § 143-215.101(b) prohibits issuance or modification of a permit “to authorize the construction, operation, or expansion of an animal waste management system that serves a swine farm that employs an anaerobic lagoon as the primary method of treatment and land application of waste by means of a sprayfield as the primary method of waste disposal.” As should be made clear by attached Exhibits 11 and 12<sup>132</sup>, this would apply to lagoon covers and digesters, which would have to comply with the following:

The Commission may issue a permit for the construction, operation, or expansion of an animal waste management system that serves a swine farm under this Article only if the Commission determines that the animal waste management system will meet or exceed all of the following performance standards: (1) Eliminate the discharge of animal waste to surface water and groundwater through direct discharge, seepage, or runoff. (2) Substantially eliminate atmospheric emission of ammonia. (3) Substantially eliminate the emission of odor that is detectable beyond the boundaries of the parcel or tract of land on which the swine farm is located. (4) Substantially eliminate the release of disease-transmitting vectors and airborne pathogens. (5) Substantially eliminate nutrient and heavy metal contamination of soil and groundwater.

N.C. Gen. Stat. § 143-215.101(b) (2007-523, s. 1(a).) We note that this statute has already been violated where DEQ has allowed Permittees to install lagoon covers and digesters that fail to comply with these statutory performance criteria. DEQ must require those operations to undertake groundwater monitoring and forbid any further covers or digesters under the General Permit.

Anaerobic digestion makes nutrients more bioavailable to plants, increasing the content of leachable nitrogen in effluent and leading to a greater risk of

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<sup>131</sup> Will Doran, *As NC Pollution Concerns Grow, so do Environmental Budget Cuts*, Raleigh News & Observer, <https://www.newsobserver.com/news/politics-government/state-politics/article174769781.html> (last visited Feb 27, 2019).

<sup>132</sup> See *Smithfield Swine Farm Biogas Strategy*, admitted on Feb. 22, 2019 as Defendant’s Exhibit 707 in *McGowan et al v. Murphy-Brown LLC d/b/a/ Smithfield Hog Production*, (E.D.N.C. Southern Division, 7:14-cv-00182), attached hereto as Exhibit 10; and attached Exhibit 11, the December 2, 2018 testimony of Kraig Westerbeeck, Vice President Environment and Support Operations, Murphy-Brown LLC from *Gillis et al. v. Murphy-Brown, LLC*, E.D.N.C. No. 7:14-cv-00185 (Exh. 9 referenced at 281).

groundwater contamination.<sup>133</sup> After anaerobic digestion, less effluent needs to be applied to the land to achieve the same fertilization effects since more of the nutrients are usable for plant uptake. Bioavailable nutrients are not locked up in microbes or absorbed to soil, making them likely to leach if not taken up by plants. Plant uptake of nutrients is relatively inefficient.<sup>134</sup>

Anaerobic digestion increases the nitrogen load in effluent by inhibiting ammonia off-gassing from the lagoon. Therefore, if a lagoon and sprayfield system with a digester continues to spray the same amount of waste on a field as before installing a digester (which often already occurs in amounts exceeding the soil's and plants' capacities to hold onto the nutrients), more bioavailable nutrients will be introduced into the system, increasing the amount of nutrients that can be leached out of the system. Furthermore, any leaching directly from the lagoon into the soil or groundwater will contain more bioavailable nutrients that stimulate eutrophication and result in negative health consequences.

Likewise, since the digester system increases the concentration of ammonium and ammonia in the lagoon, these systems produce an increase in ammonia volatilization from CAFO waste that can increase the risk of groundwater contamination nearby.<sup>135</sup> Digestate slurry volatilizes—and therefore redeposits—more ammonia than regular swine slurry.<sup>136</sup> Scientists estimate that 80-90% of total ammonia emitted from livestock operations is redeposited within roughly 6 miles of the source, and 20% is redeposited within roughly a half a mile.<sup>137</sup> Ammonia can be dry deposited on soil and plant surfaces or dissolved in water particles and precipitated back to land and waterways. In both cases, this increased volatilization not only presents atmospheric emissions concerns, but also represents an additional source of nitrogen entering waterways adjacent to CAFO operations with digesters. For the reasons described above, facilities with digesters pose an elevated risk of surface and groundwater nutrient contamination. Therefore, installing a covered lagoon/anaerobic digester system should trigger groundwater-monitoring requirements.

### ***Sampling Parameters for Groundwater Monitoring***

We strongly support quarterly sampling of monitored facilities described in Attachment B referred to in Condition III.13, as seasonality in both environmental conditions and CAFO activities influences detected impacts, with samples in winter or early spring significantly

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<sup>133</sup> Joe Harrison et al., *Transformation and Agronomic Use of Nutrients From Digester Effluent*, eXtension.org (2013), <https://articles.extension.org/pages/67900/transformation-and-agronomic-use-of-nutrients-from-digester-effluent> (last visited Feb 20, 2019).

<sup>134</sup> For example, in North Carolina, average nitrogen losses are roughly 50% of the total amount applied to the land due to leaching, volatilization, and denitrification. Osmond and Kang, *supra* n.130.

<sup>135</sup> Mallin et al., *supra* n.110; Robert Nkoa, *Agricultural benefits and environmental risks of soil fertilization with anaerobic digestates: a review*, 34 *Agronomy for Sustainable Development* 473-492 (2014).

<sup>136</sup> Nkoa, *supra* n.134.

<sup>137</sup> *Id.*

underestimating impacts from swine CAFO lagoon and sprayfield systems.<sup>138</sup> Additionally, we support the proposed monitoring parameters specified in Attachment B. While the specified parameters will provide DEQ with the necessary information to monitor CAWMP outcomes and ensure compliance with the General Permit, these parameters alone limit DEQ's ability to link swine operations to water quality indicators.

We propose expanding the parameters to include sodium, potassium, and nitrite-N concentrations, which can be used in combination with nitrate-N concentrations to isolate the impacts of swine CAFOs as opposed to poultry CAFOs or other agricultural activities.<sup>139</sup> Likewise, the use of genetic markers and isotope tracers would improve groundwater monitoring with respect to isolating the impacts of a particular operation. Furthermore, groundwater-monitoring parameters should include Total Kjeldahl Nitrogen so that sample results enable calculation of total nitrogen levels using nitrate-N, nitrite-N, and Total Kjeldahl N. We also recommend adding more up-to-date pathogen indicators—including the *E. coli* or *enterococci* standards, which EPA recommended replace fecal coliform indicators three decades ago<sup>140</sup>—as well as parameters to detect antibiotic resistant bacteria.

Lastly, we encourage DEQ to clarify the sampling procedures and standards necessary to obtain accurate and high-quality groundwater monitoring data. For instance, facilities directed to monitor water quality on a case-by-case basis should also install monitoring wells both upstream and downstream from each lagoon/storage pond. The National *Field Manual for the Collection of Water Quality Data* published by the U.S. Geological Survey is a good blueprint for standardizing appropriate groundwater monitoring protocols.<sup>141</sup> Groundwater quality data and water level data should be entered into DEQ's GIS database and made available to the public

Although there is room to go farther, DEQ has made significant improvements to monitoring groundwater quality that will provide needed information and help protect human and environmental health.

### **Condition III.15: Facility Record Keeping**

Lengthening the record retention period at facilities from 3 to 5 years is consistent with terms agreed upon in the Title VI settlement and with practices in other states. This expansion will improve accountability and transparency and make possible a more complete and longitudinal history to evaluate permit compliance. For these reasons, it is also vital that these provisions apply to all Permittees. DEQ should also facilitate more online record-keeping and allow for Permittees to convert these records from paper to digital and for the records to be filed with the Agency rather than exclusively stored on site. These changes would ease the compliance burden

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<sup>138</sup> Michael A. Mallin & Matthew R. McIver, *Season Matters When Sampling Streams for Swine CAFO Waste Pollution Impacts*, 16 J. of Water and Health; London 78–86 (2018).

<sup>139</sup> Harden, *supra* n. 111 (swine CAFOs in North Carolina tend to have higher sodium + potassium concentrations (commonly between 11 and 33 mg/L) and  $\delta^{15}\text{N}$  values of nitrate + nitrite (commonly between 11 and 26 ‰) relative to streams that have general, non-CAFO agricultural inputs).

<sup>140</sup> U.S. Environmental Protection Agency, *Ambient Water Quality Criteria for Bacteria*, 5 (1986).

<sup>141</sup> Francesca Wilde, *Collection of Water Samples (ver. 2.0): U.S. Geological Survey Techniques of Water-Resources Investigations §4.2* (2006), <http://pubs.water.usgs.gov/twri9A4/> (last visited Feb 24, 2019).

operators bear, while also greatly improving transparency and enhancing accessibility to information that impacts the environment and public health.

### **Condition III.18: Annual Certification**

We strongly support the requirement that the annual certification be filed by all Permittees. This was also a core element of the Title VI settlement and is designed to increase accountability, oversight, and transparency, and minimizes any reporting burden. However, the proposed Certification form should be revised to require additional basic information about each permitted operation, including:

- (a) each manure hauler by name and address;
- (b) which and how much additional nutrient loads were added (including but not limited to, sludges, unused feedstuff, leachate, milk waste, septage, and commercial fertilizer); and
- (c) the number of animal mortalities at each operation.

The requirement that these Annual Certifications be kept on file at the Department and made available to the public will ensure that the information most important to the public—relating to potential environmental and public health impacts of permitted operations—is up-to-date, complete, and readily accessible. We also support any effort to streamline or expedite the production, collection, dissemination, and availability of these records through digital or online methods.

### **Conditions III.17, 19-21: Notices to DWR and to the Public after Discharges**

We appreciate the clarification that the larger discharges trigger all the requirements of lesser discharges. However, Condition III.17 should be changed to require facilities to contact DWR within a shorter time—12 as opposed to 24 hours. Other states have even stricter requirements for reporting dangerous events. In Ohio, permittees must report potentially dangerous spills and discharges within 30 minutes of discovery, and in Illinois, permittees must report discharges into the waters of the state to a hotline “immediately upon discovery.” Given that the heaviest concentration of swine operations are in eastern North Carolina—where drainage conditions and other access to surface waters increase the contamination risks substantially in the event of a lagoon breach, overflow, or spill—and given the high number of lagoons and sprayfields in the floodplain, these changes to the public notice provisions are critical for DEQ to ensure transparency and accountability.

We also urge DEQ to require issuance of the press release within 24 as opposed to 48 hours after a discharge of 1,000 or more gallons of waste reaches surface waters. Two days is too long for the public to have to wait to obtain information of this magnitude, particularly given the speed and ease of using of digital media to distribute this information. We also urge DEQ to include the additional provision included in the stakeholder draft that the press release reference actions taken to prevent further discharge and a facility contact person and phone number. That information would ensure greater transparency and direct accountability to the public.

### Condition IV.1: Unannounced Inspections

This new language is an important clarification of DEQ's existing authority and aligns with best practices used in other states to incentivize compliance.<sup>142</sup> This change is also consistent with the broader goals expressed by communities of concern and other environmental advocates throughout the stakeholder process for greater oversight and monitoring of permitted operations by DEQ.

Thank you for your consideration.

Respectfully submitted,



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<sup>142</sup> See *Ind. Dep't of Env'tl. Mgmt., Guidance Manual for Indiana's Confined Feeding Program* at 93 ("An investigation of a complaint or a spill requires no prior notification.") (Dec. 2014), available at [https://www.in.gov/idem/cfo/files/guidance\\_manual\\_cfo\\_program.pdf](https://www.in.gov/idem/cfo/files/guidance_manual_cfo_program.pdf); Okla. Stat. tit. 2, § 20-14(A) (2018) (providing that the State Board of Agriculture "shall make at least one unannounced inspection per year of every swine feeding operations licensed pursuant to the Oklahoma Swine Feeding Operations Feeding Act").