NORTH CAROLINA
ENVIRONMENTAL MANAGEMENT COMMISSION
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

SWINE WASTE MANAGEMENT SYSTEM GENERAL PERMIT

This General Permit is issued pursuant to North Carolina G.S. §143-215 et seq., may apply to any swine facility in the State of North Carolina, and shall be effective from October 1, 2014 until September 30, 2019.

All activities authorized herein shall be consistent with the terms and conditions of this General Permit.

Holders of Certificates of Coverage (COC) under this General Permit shall comply with the following specified conditions and limitations.

I. PERFORMANCE STANDARDS

1. Any discharge of waste that reaches surface waters or wetlands is prohibited except as otherwise provided in this General Permit and associated statutory and regulatory provisions. Waste shall not reach surface waters or wetlands by runoff, drift, manmade conveyance, direct application, direct discharge or through ditches, terraces, or grassed waterways not otherwise classified as state waters.

   The waste collection, treatment, storage and application system operated under this General Permit shall be effectively maintained and operated as a non-discharge system to prevent the discharge of pollutants to surface waters or wetlands. Application of waste to terraces and grassed waterways is acceptable as long as it is applied in accordance with Natural Resources Conservation Service (NRCS) Standards and does not result in a discharge of waste to surface waters or wetlands.

   Facilities must be designed, constructed, operated, and maintained to contain all waste plus the runoff from a 25-year, 24-hour rainfall event for the location of the facility. A facility that has a discharge of waste that results because of a storm event more severe than the 25-year, 24-hour storm will not be considered to be in violation of this General Permit if the facility is otherwise in compliance with its Certified Animal Waste Management Plan (CAWMP) and this General Permit.

   Any discharge or application of waste to a ditch that drains to surface waters or wetlands is prohibited except as follows: (a) discharges from the ditches are controlled by best management practices (BMPs) designed in accordance with NRCS standards; (b) the BMPs have been submitted to and approved by the Division of Water Resources (Division); (c) the BMPs were implemented as designed to prevent a discharge to surface waters or wetlands; (d) the waste was removed immediately from the ditch upon discovery; and (e) the event was documented and reported in accordance with Condition III.13. of this General Permit. Nothing in this exception shall excuse a discharge to surface waters or wetlands except as may result because of rainfall from a storm event more severe than the 25-year, 24-hour storm.

2. This General Permit does not allow the Permittee to cause a violation of any of the water quality standards established pursuant to Title 15A, Subchapter 2B of the North Carolina Administrative Code and Title 15A, Subchapter 2L of the North Carolina Administrative Code.

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3. The facility's COC and its CAWMP are hereby incorporated by reference into this General Permit. The CAWMP must be consistent with all applicable laws, rules, ordinances, and standards (federal, state and local) in effect at the time of siting, design and certification of the facility.

   The Permittee must assess and record, on an ongoing basis, the effectiveness of the implementation of the CAWMP. The Permittee must make "major changes," "revisions," or "amendments" to the CAWMP, as defined in Section VII, "Definitions," of this General Permit, in order to address any changes needed to maintain compliance with the facility's COC and this General Permit. "Major changes," "revisions," and "amendments" to the CAWMP must be documented, dated, and included as part of the CAWMP. "Major changes " and "revisions" to the CAWMP shall be submitted to the appropriate Division Regional Office within thirty (30) calendar days of the "major change" or "revision." "Amendments" are not required to be submitted to the Division Regional Office unless specifically requested by the Division. If field, riser or pull numbers are changed, an explanation shall also be submitted and include a description of how the new numbers relate to the old numbers.

   Any violation of the COC or the CAWMP shall be considered a violation of this General Permit and subject to enforcement actions. A violation of this General Permit may result in the Permittee having to take immediate or long-term corrective action(s) as required by the Division. These actions may include but are not limited to: modifying the CAWMP; ceasing land application of waste; removing animals from the facility; or the COC being reopened and modified, revoked and reissued, and/or terminated.

4. Any proposed increase or modification to the annual average design capacity from that authorized by the COC will require a modification to the CAWMP and the COC prior to modification of the facility. All new and expanding operations must demonstrate that waste management system will satisfy the requirements of G.S. §143-215.10.I. No collection, treatment or storage facilities may be constructed in a 100-year flood plain.

5. Facilities located in watersheds sensitive to nutrient enrichment may be notified by the Division to conduct an evaluation of the facility and its CAWMP to determine the facility's ability to comply with the NRCS nutrient management standard as it relates to phosphorous. This evaluation will not be required until such time as the permittee is notified by the Division. The evaluation must be documented on forms supplied by or approved by the Division and must be submitted to the Division. This evaluation must be completed by existing facilities within twelve (12) months of receiving notification from the Division.

   For facilities located in watersheds sensitive to nutrient enrichment, all fields with a "HIGH" phosphorous-loss assessment rating shall have land application rates that do not exceed the established crop removal rate for phosphorous. There shall be no waste application on fields with a "VERY HIGH" phosphorous-loss assessment rating.

6. If prior approval is received from the Director of the Division (Director), facilities that have been issued a COC to operate under this General Permit may add treatment units for the purpose of removing pollutants before the waste is discharged into the lagoons/storage ponds. Prior to any approval, the Permittee must demonstrate to the satisfaction of the Director that the new treatment unit will not interfere with the operation of the existing treatment system and that a process is in place to properly manage and track the pollutants removed.

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7. If prior approval is received from the Director, facilities that have been issued a COC to operate under this General Permit may add innovative treatment processes to the systems on a pilot basis in order to determine if the innovative treatment process will improve how the waste is treated and/or managed. Prior to any approval, the Permittee must demonstrate to the satisfaction of the Director that the innovative treatment process will not interfere with the operation of the existing treatment system and that a process is in place to properly manage and track the pollutants removed.

8. Animal waste shall not be applied within 100 feet of any well with the exception of monitoring wells. The allowable distance to monitoring wells shall be established on a case-by-case basis by the Division.

9. Existing swine dry lots may remain in wetlands as long as the wetlands uses are not removed or degraded as a result of the swine. The swine however may not be confined within 100 feet of an adjacent surface water or a seasonally-flooded area. The swine also must not cause a loss of more than 10% of the existing tree canopy. Where trees do not exist, the area must be managed to include crop rotation.

II. OPERATION AND MAINTENANCE REQUIREMENTS

1. The collection, treatment, and storage facilities, and the land application equipment and fields shall be properly operated and maintained at all times.

2. A vegetative cover shall be maintained as specified in the facility's CAWMP on all land application fields and buffers in accordance with the CAWMP. No waste shall be applied upon areas not included in the CAWMP or upon areas where the crop is insufficient for nutrient utilization. However, if the CAWMP allows, then waste may be applied up to thirty (30) days prior to planting or breaking dormancy.

3. Soil pH on all land application fields must be maintained in the optimum range for crop production.

4. Land application rates shall be in accordance with the CAWMP. In no case shall land application rates exceed the agronomic rate of the nutrient of concern for the receiving crop.

5. In no case shall land application rates result in excessive ponding or any runoff during any given application event.

6. Animal waste shall not be directly applied onto crops for direct human consumption that do not undergo further processing (e.g., strawberries, melons, lettuce, cabbage, apples, etc.) at any time during the growing season, or in the case of fruit bearing trees, following breaking dormancy. Application of animal wastes shall not occur within thirty (30) days of the harvesting of fiber and food crops for direct human consumption that undergoes further processing.

7. If manure or sludges are applied on conventionally tilled bare soil, the waste shall be incorporated into the soil within two (2) days after application on the land, or prior to the next rainfall event, whichever occurs first. This requirement does not apply to no-till fields, pastures, or fields where crops are actively growing.

8. No material other than animal wastes of the type generated on this facility shall be disposed of in the animal waste collection, treatment, storage, or application systems. This includes but is not limited to pesticides, toxic chemicals and petroleum products.

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9. Domestic and/or industrial wastewater from showers, toilets, sinks, etc. shall not be discharged into the animal waste collection, treatment, storage, and application system. Washdown of stock trailers owned by and used to transport animals to and from the facility only, will be permissible as long as the system has been evaluated and approved to accommodate the additional volume. Only those cleaning agents and soaps that are EPA approved according to their label, will not harm the cover crop, and will not contravene the groundwater standards listed in 15A NCAC 2L may be utilized in facilities covered by this General Permit. Instruction labels are to be followed when using cleaning agents and soaps.

10. Disposal of dead animals resulting from normal mortality rates associated with the facility shall be done in accordance with the facility's CAWMP and the North Carolina Department of Agriculture and Consumer Services (NCDA&CS) Veterinary Division's Statutes and regulations.

    Disposal of dead animals whose numbers exceed normal mortality rates associated with the facility shall also be done in accordance with the facility's CAWMP and NCDA&CS Veterinary Division's Statutes and regulations provided that: 1) burial of such animals shall be done in consultation with the State Veterinarian of the NCDA&CS Veterinary Division's Statutes and in compliance with NCDA&CS regulations; 2) all such burial sites must be mapped, and the dates and numbers of the animals buried by species and type must be recorded; and 3) the map is submitted within fifteen (15) calendar days of burial to the Water Quality Regional Operations Section located within the appropriate Regional Office.

    In the event of a state of emergency declared by the Governor, disposal of dead animals shall be done in accordance with requirements and guidelines dictated by the State Veterinarian according G.S. §106-402.1. The Division may require groundwater monitoring when there is massive burial of animals. All burial sites of such animals must be mapped, and the dates and numbers of the animals buried by species and type must be recorded.

11. Unless accounted for in temporary storage volume, all uncontaminated runoff from the surrounding property and buildings shall be diverted away from the waste lagoons/storage ponds to prevent any unnecessary addition to the liquid volume in the structures.

12. A protective vegetative cover shall be established and maintained on all earthen lagoon/storage pond embankments (outside toe of embankment to maximum pumping elevation), berms, pipe runs, and diversions to surface waters or wetlands. Trees, shrubs, and other woody vegetation shall not be allowed to grow on the lagoon/storage pond embankments. All trees shall be removed in accordance with good engineering practices. Lagoon/storage pond areas shall be accessible, and vegetation shall be kept mowed.

13. At the time of sludge removal from a lagoon/storage pond, the sludge must be managed in accordance with the CAWMP. When removal of sludge from the lagoon is necessary, provisions must be taken to prevent damage to the lagoon dikes and liner.

14. Lagoons/storage ponds shall be kept free of foreign debris including, but not limited to, tires, bottles, light bulbs, gloves, syringes or any other solid waste.

15. The facility must have at least one of the following items at all times: (a) adequate animal waste application and handling equipment, (b) a lease, or other written agreement, for the use of the necessary equipment, or (c) a contract with a third party applicator capable of providing adequate waste application.

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16. The Permittee shall designate a certified animal waste management system operator with a valid certification to be in charge of the animal waste management system. The waste management system shall be operated by the Operator in Charge (OIC) or a person under the OIC's supervision.

17. In accordance with 15A NCAC 8F .0203(b)(2), the OIC or a designated back-up OIC of a Type A Animal Waste Management System shall inspect, or a person under the supervision of an OIC or designated back-up OIC shall inspect, the land application site as often as necessary to insure that the animal waste is land applied in accordance with the CAWMP. In no case shall the time between inspections be more than 120 minutes during the application of waste. A record of each inspection shall be recorded on forms supplied by, or approved by, the Division and shall include the date, time, sprayfield number and name of the operator for each inspection. Inspection shall include but not be limited to visual observation of application equipment, spray fields, subsurface drain outlets, ditches, and drainage ways for any discharge of waste.

    The Permittee may assert as an affirmative defense in any enforcement action alleging noncompliance with the requirements imposed in this condition that such noncompliance was due to circumstances beyond the Permittee's control. A notation shall be made on the form indicating the inspection affected by such circumstance and an explanation setting forth the circumstances claimed to have been beyond the Permittee's control shall be submitted with the form.

18. The Director may require any permittee to install and operate flow meters with flow totalizers based on the facility's violations and/or incomplete or incorrect record keeping events.

19. No waste shall be applied in wind conditions that might reasonably be expected to cause the mist to reach surface waters or wetlands or cross property lines or field boundaries.

20. The Permittee shall maintain buffer strips or other equivalent practices as specified in the facility's CAWMP near feedlots, manure storage areas and land application areas.

21. Waste shall not be applied on land that is flooded, saturated with water, frozen or snow covered at the time of land application.

22. Land application of waste is prohibited during precipitation events. The Permittee shall consider pending weather conditions in making the decision to land apply waste and shall document the weather conditions at the time of land application on forms supplied by or approved by the Division.

    Land application of waste shall cease within four (4) hours of the time that the National Weather Service issues a Hurricane Warning, Tropical Storm Warning, or a Flood Watch associated with a tropical system including a hurricane, tropical storm, or tropical depression for the county in which the permitted facility is located. Watches and warnings are posted on the National Weather Service's website located at: **www.weather.gov**. More detailed website information can be found on Page 2 of the Certificate of Coverage. Watch and warning information can also be obtained by calling the local National Weather Service Office that serves the respective county, which can be found on Page 2 of the Certificate of Coverage.

    The Director may require any permittee to install, operate and maintain devices on all irrigation pumps/equipment designed to automatically stop irrigation activities during precipitation. This decision will be based on the facility's compliance history for irrigation events.

23. Land application activities shall cease on any application site that exceeds a Mehlich 3 Soil Test Index for Copper of greater than 3,000 (108 pounds per acre) or Zinc of greater than 3,000 (213 pounds per acre).

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24. All waste application equipment must be tested and calibrated at least once every two years. The results must be documented on forms provided by, or approved by, the Division.

25. Any major structural repairs to lagoons/storage ponds must have written documentation from a technical specialist certifying proper design and installation. However, if a piece of equipment is being replaced with a piece of equipment of the identical specifications, no technical specialist approval is necessary [i.e. piping, reels, valves, pumps (if the gallons per minute (gpm) capacity is not being increased or decreased), etc.] unless the replacement involves disturbing the lagoon/storage pond embankment or liner.

26. Crops for which animal waste is land applied must be removed from the land application site and properly managed and utilized unless other management practices are approved in the CAWMP.

27. In accordance with NRCS North Carolina Conservation Practice Standard No. 359 "Waste Treatment Lagoon", an operator may temporarily lower lagoon levels to provide irrigation water during drought periods and to provide additional temporary storage for excessive rainfall during the hurricane season and in preparation for the following winter months. All conditions of NRCS NC Standard No. 359 must be satisfied prior to lowering lagoon levels below designed stop pump levels.

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III. MONITORING AND REPORTING REQUIREMENTS

1. An inspection of the waste collection, treatment, and storage structures, and runoff control measures shall be conducted and documented at a frequency to insure proper operation but at least monthly and after all storm events of greater than one (1) inch in 24 hours. For example, lagoons/storage ponds, and other structures should be inspected for evidence of erosion, leakage, damage by animals or discharge. Inspection shall also include visual observation of subsurface drain outlets, ditches, and drainage ways for any discharge of waste.

2. Monitoring and Recording Freeboard Levels

   a. Highly visible waste-level gauges shall be maintained to mark the level of waste in each lagoon/storage pond that does not gravity feed through a free flowing transfer pipe into a subsequent structure. The gauge shall have readily visible permanent markings.

      The waste level in each lagoon with a waste level gauge shall be monitored and recorded weekly on forms supplied by or approved by the Division.

      The Director may require more frequent monitoring and recording of waste levels based on the facility's compliance history for freeboard violations.

   b. Any facility which experiences freeboard violations in any two consecutive years following the issuance of this General Permit, or as determined necessary by the Director, shall monitor and record waste levels as follows:

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In addition to the facility's existing lagoon waste-level gauges, automated lagoon/storage pond waste-level monitors and recorders (monitored and recorded at least hourly) must be installed on all treatment and storage structures covered by a COC issued under this General Permit to measure and record freeboard. This equipment must be properly maintained and calibrated in a manner consistent with manufacturer's operation and maintenance recommendations. This automated equipment must be in place no later than ninety (90) days following notification from the Director. 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.

If an automated level monitor(s) becomes inoperable, the Permittee shall:

i. report the problem by telephone to the appropriate Division Regional Office as soon as possible, but in no case more than 24 hours following first knowledge of the problem; and,

ii. make any needed repairs to the equipment as quickly as possible, and take and record daily waste levels at the same time every day until such time as the automated equipment is placed back into operation.

c. The Director may require new or modified waste-level gauges at any facility if it is determined that the existing gauges are not adequate to accurately indicate actual lagoon levels, or the various lagoon levels required to be maintained by this General Permit or the facility's CAWMP.

3. Monitoring and Recording Precipitation Events

a. Precipitation events at facilities issued a COC to operate under this General Permit shall be monitored and recorded as follows:

A rain gauge must be installed at a site that is representative of the weather conditions at the farm's land application site(s) to measure all precipitation events. The precipitation type and amount must be recorded daily for all precipitation events and maintained on site for review by the Department of Environment and Natural Resources (Department).Daily records do not need to be maintained for those days without precipitation events.

b. The Director may require that an automated rain gauge and recorder must be installed on site to measure and record all precipitation events. This equipment must be properly maintained and calibrated in a manner consistent with manufacturer's operation and maintenance recommendations. This automated equipment must be in place no later than ninety (90) days following receipt of notice from the Director.

If an automated rain gauge(s) becomes inoperable, the Permittee shall:

i. report the problem by telephone to the appropriate Division Regional Office as soon as possible, but in no case more than twenty four (24) hours following first knowledge of the problem; and,

ii. make any needed repairs to the equipment as quickly as possible, and take and record all rainfall events until such time as the automated equipment is placed back into operation.

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4. A representative Standard Soil Fertility Analysis, including pH, phosphorus, copper, and zinc, shall be conducted on each application field receiving animal waste in accordance with G.S. § 143-215.10C(e)(6). As of the effective date of this General Permit, the Statute requires that the analysis be conducted at least once every three years.

5. An analysis of a representative sample of the animal waste to be applied shall be conducted in accordance with recommended laboratory sampling procedures as close to the time of application as practical and at least within sixty (60) days (before or after) of the date of application. Every reasonable effort shall be made to have the waste analyzed prior to the date of application and as close to the time of waste application as possible. This analysis shall include the following parameters:

Nitrogen	Zinc
Phosphorus	Copper

6. The Permittee shall record all irrigation and land application event(s) including hydraulic loading rates, nutrient loading rates and cropping information. The Permittee shall also record removal of solids and document nutrient loading rates if disposed of on-site, or record the off-site location(s). These records must be on forms supplied by, or approved by, the Division.

7. A record shall be created and maintained of all transfers of waste between waste structures on the same site not typically operated in series. Such record shall include at least the identity of the structure from which the waste was transferred, the identity of the structure receiving the waste, the date and time of transfer and the total volume of waste transferred.

8. The Permittee must maintain monthly stocking records for the facility and make the records available to the Department.

9. If, for any reason, there is a discharge from the waste collection, treatment, storage and application systems (including the land application sites), to surface waters or wetlands, the Permittee is required to make notification in accordance with Condition III. 13. The discharge notification shall include the following information:

   a. Description of the discharge: A description of the discharge including an estimate of the volume discharged, a description of the flow path to the receiving surface waters or wetlands and a site sketch showing the path of the waste.

   b. Time of the discharge: The length of time of the discharge, including the exact dates and times that it started and stopped, and if not stopped, the anticipated time the discharge is expected to continue.

   c. Cause of the discharge: A detailed statement of the cause of the discharge. If caused by a precipitation event, detailed information from the on-site rain gauge concerning the inches and duration of the precipitation event.

   d. All steps being taken to reduce, stop and cleanup the discharge. All steps to be taken to prevent future discharges from the same cause.

   e. Analysis of the waste: A copy of the last waste analysis conducted as required by Condition III. 5. above.

   f. A waste sample, obtained within seventy-two (72) hours following first knowledge of the discharge to surface waters or wetlands, from the source lagoon/storage pond, shall be analyzed for the following minimum parameters:

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Fecal coliform bacteria	Five-day biochemical oxygen demand (BOD_5)
Total suspended solids	Total phosphorous
Ammonia nitrogen (NH_3-N)	Total Kjeldahl nitrogen (TKN)
Nitrate nitrogen (NO_3-N)	

Monitoring results must be submitted to the Division within thirty (30) days of the discharge event.

10. In accordance with 15A NCAC 02T .0108(c), the Division may require any monitoring and reporting (including but not limited to groundwater, surface water or wetland, waste, sludge, soil, lagoon/storage pond levels and plant tissue) necessary to determine the source, quantity, quality, and effect of animal waste upon the surface waters, groundwaters or wetlands. Such monitoring, including its scope, frequency, duration and any sampling, testing, and reporting systems, shall meet all applicable Division requirements.

11. A copy of this General Permit, the facility's COC, certification forms, lessee and landowner agreements, the CAWMP and copies of all records required by this General Permit and the facility's CAWMP shall be maintained by the Permittee in chronological and legible form for three (3) years. Records include but are not limited to: soil and waste analyses, rain gauge readings, freeboard levels, irrigation and land application event(s), past inspection reports and operational reviews, animal stocking records, records of additional nutrient sources applied (including but not limited to sludges, unused feedstuff leachate, milk waste, septage and commercial fertilizer), cropping information, waste application equipment testing and calibration, and records of removal of solids to off-site location(s). These records shall be maintained on forms provided or approved by the Division and shall be readily available at the facility (stored at places such as the farm residence, office, outbuildings, etc.) where animal waste management activities are being conducted.

12. Within fifteen (15) working days of receiving the request from the Division, the Permittee shall provide to the Division one (1) copy of all requested information and reports related to the operation of the animal waste management system. Once received by the Division, all such information and reports become public information, unless they constitute confidential information under G.S. § 132-1.2, and shall be made available to the public by the Division as specified in Chapter 132 of the General Statutes.

13. Regional Notification:

    The Permittee shall report by telephone to the appropriate Division Regional Office as soon as possible, but in no case more than twenty-four (24) hours following first knowledge of the occurrence of any of the following events:

    a. Failure of any component of the animal waste management system resulting in a discharge to ditches, surface waters, or wetlands.

    b. Any failure of the waste treatment and disposal system that renders the facility incapable of adequately receiving, treating, or storing the waste and/or sludge.

    c. A spill or discharge from a vehicle transporting waste or sludge to the land application field which results in a discharge to ditches, surface waters, or wetlands or an event that poses a serious threat to surface waters, wetlands, or human health and safety.

    d. Any deterioration or leak in a lagoon/storage pond that poses an immediate threat to the environment or human safety or health.

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e. Failure to maintain storage capacity in a lagoon/storage pond greater than or equal to that required in Condition V.2. of this General Permit.

f. Failure to maintain waste level in a lagoon/storage pond below that of the designed structural freeboard (twelve (12) inches from top of dam or as specified in lagoon/storage pond design). Note that this notification is in addition to the report required by Condition III.13.e above.

g. An application of waste either in excess of the limits set out in the CAWMP or where runoff enters ditches, surface waters, or wetlands.

h. Any discharge to ditches, surface waters, or wetlands or any discharge that poses a serious threat to the environment or human health or safety.

For any emergency, which requires immediate reporting after normal business hours, contact must be made with the Division of Emergency Management at **1-800-858-0368**.

The Permittee shall also file a written report to the appropriate Division Regional Office within five (5) calendar days following first knowledge of the occurrence. This report shall outline the actions taken or proposed to be taken to correct the problem and to ensure that the problem does not recur. In the event of storage capacity violations as described in Condition III.13.e, the written report shall outline the actions proposed to be taken to restore compliance within thirty (30) calendar days. The requirement to file a written report may not be waived by the Division Regional Office.

In the event the waste level in a lagoon/storage pond is found to be within the designed structural freeboard, the Permittee shall file a written report to the appropriate Division Regional Office within two (2) calendar days following first knowledge of the occurrence. This report shall outline actions taken or proposed to be taken to reduce waste levels below the designed structural freeboard within five (5) calendar days of first knowledge of the occurrence.

14. The Director may require any permittee to file an annual certification report or other reports/certifications based on the compliance history of the facility. If required, the report must be filed on forms provided by the Division.

15. In the event of a discharge of 1,000 gallons or more of waste to surface waters or wetlands, the Permittee must issue a press release to all print and electronic news media that provide general coverage in the county in which the discharge occurred setting out the details of the discharge. The press release must be issued within forty-eight (48) hours after it is determined that the discharge has reached the surface waters or wetlands. A copy of the press release and a list of the news media to which it was distributed must be kept for at least one (1) year after the discharge and must be distributed to any person upon request.

16. In the event of a discharge of 15,000 gallons or more of animal waste to surface waters or wetlands, a public notice is required in addition to the press release described in Condition III 15. The public notice must be placed in a newspaper having general circulation in the county in which the discharge occurred and the county immediately downstream within ten (10) days of the discharge. The minimum content of the notice is the name of the facility, location of the discharge, estimated volume of waste entering state waters, time and date discharge occurred, duration of the discharge, identification water body that was discharged into including creek and river basin if applicable, actions taken to prevent further discharge, and a facility contact person and phone number.

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17. If a discharge of 1,000,000 gallons of wastewater or more reaches surface waters or wetlands, the appropriate Division Regional Office must be contacted to determine in what additional counties, if any, a public notice must be published. A copy of all public notices and proof of publication must be sent to the Division within thirty (30) days of the discharge.

18. All facilities, which are issued a COC to operate under this General Permit, shall conduct a survey of the sludge accumulation in all lagoons every year. The survey report should be written on forms provided or approved by the Division and shall include a sketch showing the depth of sludge in the various locations within each lagoon. This survey frequency may be reduced if it can be demonstrated to the satisfaction of the Division that the rate of sludge accumulation does not warrant an annual survey.

    If the sludge accumulation is such that the structure does not satisfy the criteria set by NRCS NC Conservation Practice Standard No. 359, a sludge removal or management plan must be submitted to the appropriate Division Regional Office within ninety (90) days of the determination. The plan shall describe removal and waste utilization procedures to be used. Compliance regarding sludge levels must be achieved within two (2) years of the determination.

IV. INSPECTIONS AND ENTRY

1. The Permittee shall allow any authorized representative of the Department, upon the presentation of credentials and other documents as may be required by law and in accordance with reasonable and appropriate biosecurity measures, to:

    a. Enter the Permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this General Permit;

    b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this General Permit;

    c. Inspect, at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this General Permit; and,

    d. Sample or monitor, at reasonable times, for the purpose of assuring permit compliance, any substances or parameters at any location.

V. GENERAL CONDITIONS

1. The issuance of a COC to operate under this General Permit shall not relieve the Permittee of the responsibility for compliance with all applicable surface water, wetlands, groundwater and air quality standards or for damages to surface waters, wetlands or groundwaters resulting from the animal operation.

2. The maximum waste level in lagoons/storage ponds shall not exceed that specified in the facility's CAWMP. At a minimum, maximum waste level for lagoons/storage ponds must not exceed the level that provides adequate storage to contain the 25-year, 24-hour storm event plus an additional one (1) foot of structural freeboard except that there shall be no violation of this condition if: (a) there is a storm event more severe than a 25-year, 24-hour event, (b) the Permittee is in compliance with its CAWMP, and (c) there is at least one (1) foot of structural freeboard.

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In addition to the above requirements, for new and expanding farms with lagoon and storage pond designs completed after September 1, 1996, storage must also be provided for the heavy rainfall factor for the lagoons/storage pond. In case of lagoons/storage ponds in series that are gravity fed, the 25-year, 24-hour storm event and/or the heavy rainfall factor storage requirement for the system may be designed into the lowest lagoon/storage pond in the system. However, adequate freeboard must be designed into the upper lagoons/storage ponds to allow sufficient storage to prevent the waste level from rising into the structural freeboard while the storm water is draining into the lowest structure in the system.

3. Any containment basin, such as a lagoon or a storage pond, used for waste management shall continue to be subject to the conditions and requirements of this General Permit until properly closed. When the containment basin is properly closed in accordance with the NRCS NC Conservation Practice Standard No. 360 "Closure of Waste Impoundments," February 2008 or any subsequent amendment, the containment basin shall not be subject to the requirements of this General Permit. The Permittee must submit a letter to the Division to request rescission of the COC by providing documentation of closure of all containment basins.

   Closure shall also include a minimum of 24 hours pre-notification of the Division and submittal of the Animal Waste Storage Pond and Lagoon Closure Report Form to the address identified on the form within fifteen (15) days of completion of closure.

4. This General Permit allows for the distribution of up to four (4) cubic yards of manure per visit to individuals for personal use. The maximum distribution of manure per individual for personal use is ten (10) cubic yards per year. The Permittee must provide the recipient(s) with information on the nutrient content of the manure. Distribution of greater quantities must be to individuals or businesses permitted to distribute the waste, or to be land applied to sites identified in the Permittee's CAWMP.

   The Permittee must inform the recipient(s) of his/her responsibilities to properly manage the land application of manure. Record keeping for the distribution of manure up to four (4) cubic yards per visit or ten (10) cubic yards per year to individuals for personal use is not required.

5. The annual permit fee shall be paid by the Permittee within thirty (30) days after being billed by the Division. Failure to pay the fee accordingly constitutes grounds for revocation of its COC to operate under this General Permit.

6. Failure of the Permittee to maintain, in full force and effect, lessee and landowner agreements, which are required in the CAWMP, shall constitute grounds for revocation of its COC to operate under this General Permit.

7. A COC to operate under this General Permit is not transferable. In the event there is a desire for the facility to change ownership, or there is a name change of the Permittee, a Notification of Change of Ownership form must be submitted to the Division, including documentation from the parties involved and other supporting materials as may be appropriate. This request shall be submitted within sixty (60) days of change of ownership. The request will be considered on its merits and may or may not be approved.

8. A COC to operate under this General Permit is effective only with respect to the nature and volume of wastes described in the application and other supporting data. The Permittee shall notify the Division immediately of any applicable information not provided in the permit application.

   Any proposed modification to an animal waste management system including the installation of lagoon covers shall require approval from the Division prior to construction.

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9. If the Permittee wishes to continue an activity regulated by this General Permit after the expiration date of this General Permit, the Permittee must apply for and obtain a new COC. Renewal applications must be filed at least 180 calendar days prior to the expiration of the General Permit.

10. The issuance of a COC to operate under this General Permit does not prohibit the Division from reopening and modifying the General Permit or COC, revoking and reissuing the General Permit or COC, or terminating the General Permit or COC as allowed by the appropriate laws, rules, and regulations.

11. The Director may require any person, otherwise eligible for coverage under this General Permit, to apply for an individual permit by notifying that person that an application is required.

12. The Groundwater Compliance Boundary is established by 15A NCAC 2L .0102 and 15A NCAC 2T .0103. An exceedance of Groundwater Quality Standards at or beyond the Compliance Boundary is subject to the requirements of 15A NCAC 2L and the Division in addition to the penalty provisions applicable under the North Carolina General Statutes.

13. Upon abandonment or depopulation for a period of four years or more, the Permittee must submit documentation to the Division demonstrating that all current NRCS standards are met prior to restocking of the facility.

VI. PENALTIES

1. Failure to abide by the conditions and limitations contained in this General Permit; the facility's COC; the facility's CAWMP; and/or applicable state law; may subject the Permittee to an enforcement action by the Division including but not limited to the modification of the animal waste management system, civil penalties, criminal penalties and injunctive relief.

2. The Permittee must comply with all conditions of this General Permit. Any permit noncompliance constitutes a violation of state law and is grounds for enforcement action; for permit coverage termination, revocation and reissuance, or modification; or denial of a permit coverage renewal application.

3. It shall not be a defense for a Permittee in an enforcement action to claim that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this General Permit.

VII. DEFINITIONS

25-year, 24-hour rainfall or storm event means the maximum 24-hour precipitation event with a probable recurrence interval of once in 25 years, as defined by the National Weather Service in Technical Paper Number 40, "Rainfall Frequency Atlas of the United States," May 1961, and subsequent amendments, or equivalent regional or state rainfall probability information developed therefrom.

Agronomic rates means the amount of animal waste and/or other nutrient sources to be applied to lands as outlined in NRCS NC Conservation Practice Standards No. 590 "Nutrient Management" or as recommended by the NCDA&CS and the North Carolina Cooperative Extension Service at the time of certification of the Animal Waste Management Plan by the appropriate certified technical specialist.

Amendment to the CAWMP means a change and/or addition to a part(s) of the plan, and requires that the change and/or addition adhere to current applicable standards. The following are examples of amendments to the CAWMP:

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- In an existing CAWMP, a change in crops and/or cropping pattern that utilizes 25% or less of the N generated is considered a plan amendment. Additional acreage needed to facilitate the change in crops and/or cropping pattern is permissible and considered part of the amendment.

- The addition of winter crops and/or interseeded perennial crops are considered amendments to an existing CAWMP when the operation does not require additional acreage and/or crops for N utilization, and does not exceed the 25% criteria stated above.

- When a CAWMP cannot meet N utilization requirements due to land lost to irrigation inefficiency (useable versus total acres), then the CAWMP may be amended to increase available acreage and/or change the crop for N utilization. This is the only exception to the 25% N criteria for plan revision.

- Inclusions of emergency action plans, and insect, odor and mortality checklists are considered CAWMP amendments.

- Including additional acreage for land application beyond what is required in the existing CAWMP is considered a plan amendment.

Animal feeding operation means a lot or facility (other than an aquatic animal production facility) where the following conditions are met: (i) animals (other than aquatic animals) have been, are, or will be stabled or confined and fed or maintained for a total of forty five (45) days or more in any twelve (12) month period, and (ii) crops, vegetation, forage growth, or post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility. Two or more animal feeding operations under common ownership are considered to be a single animal feeding operation if they adjoin each other, or if they use a common area or system for the disposal of wastes.

Certification means technical specialist certification of the CAWMP in accordance with the requirements of 15A NCAC 02T .1304. It is unrelated to terms "Annual Certification" as used in Condition III.14 of this General Permit, and the "No Discharge Certification Option" allowed by the November 2008 EPA CAFO Rule.

Ditch means any man made channel for the purpose of moving water off a site to the surface waters.

Excessive Ponding means any area of the application field where visible liquid waste is ponded on the surface of the land application site more than four (4) hours following the application of waste. Excessive ponding also means any areas where the ponding of waste has resulted in crop failure.

Groundwaters means any subsurface waters, as defined in 15A NCAC 2L .0102.

Land application means the application of wastewater and/or waste solids onto or incorporation into the soil.

Major changes to the CAWMP means changes in the number of animals, type of operation (feeder to finish to wean to feeder), retrofit of a lagoon, installation of a new irrigation system, and similar type changes. Recertification is only required for major changes to the CAWMP. Major changes to a facility must first be approved by the Division. The new CAWMP and the certification shall be submitted with a request that the COC be amended to reflect the changes. The facility may not make the changes until a new or amended COC has been issued.

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Revision to the CAWMP means a change to an entire CAWMP to meet current applicable standards. A CAWMP must be revised if the operation cannot utilize all N nitrogen generated by the animal production in accordance with the existing CAWMP, except for the specific conditions noted in the CAWMP amendment criteria as previously defined. For an existing CAWMP, a change in crops and/or cropping pattern that utilizes more than 25% of the N generated by the operation is considered a plan revision. Any change to an existing CAWMP, whether an amendment or revision, must be signed and dated by both the producer and a technical specialist for the new CAWMP to be valid. A revision of the CAWMP does not require recertification.

State Waters means all surface waters, wetlands, groundwaters and waters of the United States located in the State.

Surface Waters means any stream, river, brook, swamp, lake, sound, tidal estuary, bay, creek, reservoir, waterway, or other surface body or surface accumulation of water, whether public or private, or natural or artificial, that is contained in, flows through, or borders upon any portion of the State of North Carolina, including any portion of the Atlantic Ocean over which the State has jurisdiction as well as any additional Waters of the United States which are located in the State.

Waste means manure, animal waste, process wastewater and/or sludge generated at an animal feeding operation.

Wetlands means areas that are inundated or saturated by an accumulation of surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions, as defined in 15A NCAC 2B .0202.

This General Permit issued the 20th day of February, 2014.

NORTH CAROLINA ENVIRONMENTAL MANAGEMENT COMMISSION

_____, Director
Thomas A. Reeder
North Carolina Division of Water Resources
By Authority of the Environmental Management Commission

Permit Number AWG100000

DRAFT

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WATERKEEPER ALLIANCE

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NCEJN and Allies Respond to Latest Attack by Hog Industry

by **Guest Contributor**
Jan 6 2017

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This post originally appeared on North Carolina Environmental Justice Network's website.

Bullies don't like it when you fight back. For decades, the multi-national corporations that control the hog industry in Eastern North Carolina have bullied people who live near hog facilities. Elsie Herring has been standing up to the industry since the mid-1990s, and she's gotten a lot of attention. Now, the industry is hiding behind a public relations front group, NC Farm Families, in an effort to discredit Ms. Herring and unfairly minimize the suffering that comes with living next-door to an industrial hog

facility.

Ms. Herring lives in Wallace, NC—in Duplin County, which hosts more than 2 million hogs– on land that has been in her family for over 100 years. A few decades ago, industrial hog facilities began to appear in Ms. Herring's community—just as they did in many communities of color across eastern NC. As illustrated by this 2016 photo, showing the sprayfield near the corner of River Road and Beulah Herring Lane, Elsie's home is now surrounded by these facilities, and her health and quality of life have suffered as a result. As Ms. Herring recently stated in the News & Observer, "My family, neighbors, and I have been held prisoner in our own homes by the unbearable stench from the multiple industrial hog operations within a quarter mile of my community." Ms. Herring no longer dries her clothes on a clothesline, for fear that they would be covered by hog manure sprayed by the facility next-door. She doesn't garden or entertain outdoors, and no longer uses her well or fishes or swims in nearby streams. Yet, in a gross dismissal of her suffering, NC Farm Families inaccurately claimed that Ms. Herring's problems were resolved 18 years ago.

The industry claimed to have ended the problems its pollution causes by planting some trees. There's some dispute about the distance between Elsie's home and the nearest field where hog manure is being sprayed; however, this 2016 video footage [Video of Spraying] of the sprayfield closest to Elsie's home (which NC Farm Families ignores in their recent attack, identifying only the sprayfields near River Road), makes clear that waste is still being sprayed very close to her house.

Even if we take industry spokespersons at their word, they're distributing liquid waste within 200 feet of Ms. Herring's property. These trees cannot—and do not—prevent wind from blowing manure onto Ms. Herring's home and discouraging her from using her own property. Nor can they eliminate the noxious odor that permeates the air. Nor can they cure the groundwater pollution that prevents her from using her well. In short, planting trees was an inadequate measure taken long ago to address problems that persist today. Ms. Herring continues to suffer the effects of the hog facilities next-door, and she continues to speak out about the pollution from these operations—a burden that disproportionately harms African Americans, Latinos, and Native Americans.

By attacking Ms. Herring, the industry seeks to draw focus away from the system of environmental racism that it perpetuates. But Ms. Herring's experience is, sadly, not unique. Instead, it is representative of the plight of countless North Carolinians who live near industrial hog facilities. Because of that reality, Ms. Herring has worked for years as an NCEJN community organizer to support those whose stories mirror her own. She is not alone in her suffering, and she is not alone in her advocacy.

The industry attack is also meant to discredit the Waterkeeper Alliance, which, along with NCEJN, seeks to raise up the voices of those harmed by pollution from industrial hog facilities. But this misleading attack serves only to emphasize the importance of standing united against the deceptive industrial hog industry. As Ms. Herring wrote in her op-ed, "I support family farmers, but the multi-billion dollar, multi-national corporation that owns

80 percent of the pigs in North Carolina is putting my family at risk." Along with brave advocates like Ms. Herring, NCEJN and Waterkeeper Alliance will continue to work with our partners to promote health and environmental quality for all people of North Carolina. The polluting practices of the industrial hog industry demand a response, and we're fighting back.

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JANUARY 18, 2017 4:48 PM

EPA faults N.C. over health of minority communities near hog farms

BY CRAIG JARVIS
cjarvis@newsobserver.com

Two years into an investigation of the health problems affecting minority communities near large-scale hog operations, the U.S. Environmental Protection Agency's civil rights office has written a stern "letter of concern" to state regulators.

The EPA says the N.C. Department of Environmental Quality has not done enough to reduce asthma, stench, flies, truck traffic and other problems caused by the facilities. The federal agency also says it has "grave concerns" about reports from minority neighbors of threats and intimidation against those who

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have complained.

The 25-page letter to the state environmental agency, dated Jan. 12, begins by acknowledging the change in administrations with Democratic Gov. Roy Cooper's victory over incumbent Republican Pat McCrory. Lilian S. Dorka, head of the EPA's External Civil Rights Compliance Office, writes that the agency recognizes there are new leaders who haven't been involved in the issue.

Dorka said even though the EPA hasn't finished its investigation, it sees a window of opportunity to quickly resolve the dispute, beginning with a meeting by state and local officials.

The EPA faults North Carolina for not having an anti-discrimination policy in place, as required by federal law, and for not imposing requirements on hog farmers to use better technologies and practices to reduce pollution.

"

THE STATE HAS ACTED AS THOUGH THESE CONCERNS WERE NOT LEGITIMATE.

Will Hendrick, Waterkeeper Alliance

"We all are glad the EPA expressed and shared those concerns," Will Hendrick, an attorney with Waterkeeper Alliance in Chapel Hill, said Wednesday. "We're also hopeful that the new administration will view this as an opportunity to take long overdue action. The state has acted as though these concerns were not legitimate."

A spokesman for the state agency said

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Wednesday the letter is being reviewed.

The N.C. Pork Council responded by pointing out that the industry is heavily regulated in North Carolina, with a ban on constructing new farms, annual inspections, mandatory setbacks from neighbors, and prohibition on discharging waste into the state's waters.

"North Carolina hog farmers are good neighbors who care deeply about protecting our water and air," Andy Curliss, chief executive officer of the Pork Council, said in a statement released Wednesday. "We welcome the opportunity to sit down with state regulators and those who live near our farms to address any concerns they may have."

North Carolina's swine industry is mostly confined to Duplin and Sampson counties. There are more than 9 million hogs allowed in more than 2,000 industrial hog facilities, which are operating under a permit that the state issued.

"

NORTH CAROLINA HOG FARMERS ARE GOOD NEIGHBORS WHO CARE DEEPLY ABOUT PROTECTING OUR WATER AND AIR.

Andy Curliss, CEO of the N.C. Pork Council

The conflict between large-scale hog farms and their neighbors dates to the 1980s, with the expansion of industrial livestock operations. In 1997, the General Assembly put a moratorium on expanding swine operations that used lagoons and field spraying to manage hog waste. The moratorium was made permanent

in 2007, but farms already operating were allowed to continue.

In 2014, environmental advocacy groups N.C. Environmental Justice Network, Rural Empowerment Association for Community Help, and Waterkeeper Alliance filed an administrative complaint over DEQ re-issuing the swine permit without substantially revising waste management requirements. In 2015, the EPA began looking at whether the operations discriminated against minorities by disproportionately threatening their health.

Later in its investigation, the agency also began pursuing reports of harassment. Federal officials said some of those interviewed reported firsthand experiences with swine operation owners or operators that included verbal threats, being tailgated over long distances as they drove, and being confronted with firearms and physical violence. The EPA letter says many neighbors gave up, feeling that state regulators would not help them.

Craig Jarvis: 919-829-4576, @CraigJ_NandO

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A Step Toward Environmental Justice in North Carolina's Hog Country

Wednesday, February 08, 2017

By Sue Sturgis, Facing South | Report

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After years of seeking help from state officials, people living near industrial hog farms across Eastern North Carolina had their fears about health-damaging pollution and industry harassment recognized by the US Environmental Protection Agency.

The EPA's External Civil Rights Compliance Office (ECRCO) sent a letter to the NC Department of Environmental Quality (NCDEQ) last month stating that it "has deep concern about the possibility that African Americans, Latinos, and Native Americans have been subject to discrimination" as a consequence of the state's oversight of its 2,000 hog farms. The farms typically store animal waste in open lagoons and spray it on nearby fields, leading to air and water pollution.

The EPA is investigating a federal civil rights complaint related to hog farms that was filed in 2014 by the NC Environmental Justice Network, the Rural Empowerment Association for Community Help and Waterkeeper Alliance alleging discrimination by NCDEQ based on race and national origin. The complaint alleged that NCDEQ's 2014 renewal of the general permit under which industrial hog farms operate failed to adequately control animal waste and discriminatorily subjected communities of color to noxious odors, health problems and declining property values.

Industrial hog farms are concentrated in Eastern North Carolina, the historic center of the state's African-American population and home to a growing Latino community and the state-recognized Lumbee Tribe. A 2014 analysis by UNC researchers found that the proportion of African Americans, Hispanics and American Indians living within three miles of an industrial swine operation are 1.54, 1.39 and 2.18 times higher, respectively, than the proportion of non-Hispanic whites.

In 2015, the complainants and NCDEQ entered into an alternative dispute resolution

process funded by the EPA. But the complainants withdrew from that process last year after NCDEQ attempted to bring representatives of the NC Pork Council and the National Pork Producers Council into what were supposed to be confidential mediation proceedings. So now ECRCO is also investigating whether NCDEQ violated a federal law that prohibits intimidating an individual or group because of actions taken to secure rights under nondiscrimination laws.

Particularly egregious instances brought to ECRCO's attention include a local industrial swine facility operator entering the home of an elderly African American woman and shaking the chair she sat in while threatening her and her family with physical violence if they continued to complain about the odors and spray.

As part of its ongoing investigation, ECRCO visited North Carolina in November and interviewed over 60 people living near industrial hog farms. Most of those interviews took place in Duplin and Sampson counties, which have the state's greatest concentration of swine operations. The investigators heard stories from residents about living with the overpowering stench, constant swarms of flies and heavy truck traffic.

"Some described feeling as though they are prisoners in their own homes," ECRCO said in its letter to NCDEQ.

North Carolina residents have been raising concerns about industrial hog farms with state officials for at least 15 years, under both Democratic and Republican administrations. Though some residents told ECRCO they did not know where or how to file complaints with NCDEQ, others told investigators that doing so resulted in retaliation, threats, intimidation and harassment by hog farm operators and representatives of the politically powerful pork industry.

Residents and Riverkeepers recounted numerous nerve-racking incidents: sustained tailgating, vehicles driving back and forth in front of their homes, confrontations in parking lots and intersections, even threats involving guns and other physical violence. As the federal investigators noted in their letter:

> Particularly egregious instances brought to ECRCO's attention include a local industrial swine facility operator entering the home of an elderly African American woman and shaking the chair she sat in while threatening her and her family with physical violence if they continued to complain about the odors and spray; the firing of a gun in the air when an African American REACH member

tried to speak to a person sitting on their porch; and a truck that sped up and swerved toward a Riverkeeper who was standing on the side of a public road teaching a group of volunteers how to sample water from public ditches.

The NCDEQ under the previous administration of Gov. Pat McCrory (R) argued for dismissal of the civil rights complaint but didn't deny that hog farms operating under the general permit had discriminatory impacts. ECRCO rejected McCrory's request, noting that NCDEQ's responses have not "served to diminish [its] level of concern."

ECRCO is recommending that NCDEQ assess the general permit and related regulations and remedy adverse effects. It also called on NCDEQ to evaluate and adjust its policies to ensure protection of residents who provide information about environmental or civil rights complaints.

Michael Regan, the new NCDEQ secretary under Gov. Roy Cooper (D), had a letter in Raleigh's News & Observer newspaper last week in which he said his agency takes ECRCO's concerns seriously and "will take this opportunity to thoroughly explore this matter with an open mind and a fresh set of eyes."

Regan, who is African-American and grew up in the Eastern North Carolina city of Goldsboro, formerly worked in the EPA's air quality division and served as the Southeast regional director for the Environmental Defense Fund. He still faces confirmation by the Republican-controlled state Senate, though Cooper is challenging that newly-imposed requirement in court.

Some of those involved in the civil rights case see reason for hope.

"For far too long, NCDEQ has prioritized customer service for the benefit of polluters instead of environmental protection for the benefit of all North Carolinians," said Will Hendrick, staff attorney with the Waterkeeper Alliance. "We are glad EPA shared our concerns and are hopeful that the new NCDEQ administration will view this as an opportunity to take long overdue action."

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SUE STURGIS

Sue is editorial director at the Institute for Southern Studies, which she joined in November 2005 as director of the Institute's Gulf Coast Reconstruction Watch, a project to document and investigate the post-Katrina recovery. A former staff writer for the Raleigh News & Observer and Independent Weekly (Durham, North Carolina), Sue directs and regularly contributes to the Institute's online magazine, Facing South, with a focus on energy and environmental issues. Sue is the author or coauthor of five Institute reports, including "Faith in the Gulf" (August/September 2008), "Hurricane Katrina and the Guiding Principles on Internal Displacement" (January 2008) and "Blueprint for Gulf Renewal" (August/September 2007). Sue holds a master's degree in journalism from New York University.

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ENVIRONMENT

At a weird meeting, Gov. McCrory warns ag board about "environmental extremists"

By Lisa Sorg July 29, 2016 1 Comment In Environment

Print This Post

Ag Bill signing_1_0

Gov. McCrory signs the farm bill after making odd remarks about environmental extremists. (Photo from the governor's office.)

This week's agriculture board should have been a snooze. Instead, it was a doozy. On the agenda were two ceremonial items: Governor Pat McCrory would sign the farm bill and Associate Supreme Court Justice Paul Newby would swear in new board members. And then, the board would delve into a mind-numbing discussion of ag rules, including those on pen-raised quail and garbage-fed swine.

But McCrory opened his remarks with an odd pronouncement:

"A lot of work being done by extremist environmental groups" which, although not naming names, McCrory said, are planning attacks on the state's agribusinesses.

"I'm concerned about what I'm seeing behind the scenes," McCrory went on. "I'm looking for [illegible] you [the agricultural board] about from where and why these assaults are coming. We can't have these types of people putting us out of business."

Font Size: - +

NCPW contacted the governor's press office by phone and email to elicit more information about the identity of the groups and the source of his information. No one from the press office has returned our messages.

McCrory also used the ag board pulpit to assail the Environmental Protection Agency over its new Clean Water Rule. The rule adds and clarifies protections of waterways that have been historically covered under the Clean Water Act: tributaries, wetlands, and waters that connect with oceans and rivers that cross state lines.

"It's pretty extensive federal government intervention," McCrory said. "We need to stop or revise it. The EPA is getting more involved in our state's rivers and streams. It could have major ramifications for the agricultural community."

However, the EPA is clear that the new rule doesn't require any new permitting from farmers and retains most of the agricultural exemptions. In fact, many agricultural practices, such as planting, harvesting and moving livestock, have been exempt from the Clean Water Act.

The meeting was odd from the get-go, when Justice Paul Newby swore in three new agriculture board members. Bible in hand, Newby invoked state General Statute 11. Article 1 of the statute defines oaths as "being most solemn appeals to Almighty God, as the omniscient witness of truth and the just and omnipotent avenger of falsehood."

"This is a reminder that God sees everything," Newby added. "You can never fool God."

Assuming that's true, that means God also saw the $2 million that poured into Newby's campaign coffers in 2012. A regular on the tea party circuit, Newby received contributions from conservative groups and super PACs, such as the , the NC Judicial Coalition, Justice for All and the Republican State Leadership Committee, which were trying to influence the ostensibly nonpartisan elections.

The RSLC spearheaded the redistricting maps that favored Republicans. These are the same maps that came before the state supreme court — of which, again, Newby is an associate justice — to rule on their constitutionality.

With that as context, consider Newby's money quote as he cautioned incoming board members about the temptations of public service. "People have long through public office is for personal gain," Newby said. "But you have put personal self-gain aside. It's a difficult thing to do."

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McCrory visits Raleigh rally defending hog farming industry

By GARY D. ROBERTSON - *Associated Press - Thursday, October 1, 2015*

Print View Comments

RALEIGH, N.C. (AP) - North Carolina's hog industry has been getting organized this year to combat what it considers misleading information about its farming operations and to oppose litigation challenging its environmental practices, and it took that fight to the state Capitol on Thursday.

A group called North Carolina Farm Families held a rally on the old Capitol grounds in Raleigh and dropped off more than 11,000 petitions with Gov. Pat McCrory. The governor addressed the crowd of more than 300, showing his support.

"We want our elected officials here in Raleigh to hear us and we want them to stand up for North Carolina farm families," group president Ed Emory told the crowd. "Our opponents accuse hog farmers of causing environmental problems, and that's simply not true."

The group, which counts Smithfield Foods and Murphy-Brown LLC among dozens of supporting organizations, began after environmental advocacy groups and eastern North Carolina residents filed complaints against large-scale hog operations. Both Murphy-Brown and Smithfield are under the umbrella of China-based WH Group.

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Johnson singled out the Waterkeeper Alliance, a New York-based environmental group that has sued the industry and erected billboards this summer blaming industrial hog operations for polluted rivers and stench in the air.

North Carolina Farm Bureau President Larry Wooten said he was tired “of the constant attacks on you and your families from third-party lawsuits. I’m tired of the harassment by out-of-state lawyers.”

In a statement Thursday, the Waterkeeper Alliance said it sues when all other efforts have failed to stop pollution. The lagoon and spray systems that most hog operations still use to dispose of hog waste harm water quality, according to Matthew Starr, the Upper Neuse Riverkeeper, an alliance member.

“It’s way past time for the industry and local producers to be honest about their failed outhouse system of disposing of raw animal waste by dumping it on to fields,” Starr said.

A separate class-action lawsuit filed by hundreds of eastern North Carolina residents accuses Murphy-Brown, a pioneer in factory-style operations, of failing to do enough about the smells and flies associated with hog operations.

The Farm Families group says hog farmers are environmentally responsible and subject to annual inspections. More than 80 percent of the state’s hog farms are owned and operated by families, the group says. N.C. Farm Families or their allies have been producing mailers and generating mass phone calls promoting the industry’s contributions to the state.

“The way we’re represented is not true, and I think it’s important that we get the truth out that we do take care of our land and our animals,” said Megan Spence of Wayne County, whose family operates a farm that includes about 3,500 sows. The farm contracts its hogs to Smithfield.

McCrory, the former Charlotte mayor, told the crowd that state government leaders would fight for them, adding he respects

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farmers even when “extreme groups” don’t.

“We know you care for the environment, we know you respect the environment and you also respect the needs that we have for food for not only North Carolina for the rest of the world,” he said.

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Environmental Groups Challenge NCDEQ For Failing To Respond to Citizen Complaints

by **Waterkeeper Alliance**
Dec 7 2016

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RALEIGH, NC –

Yesterday, Waterkeeper Alliance, Cape Fear River Watch and the North Carolina Environmental Justice Network (NCEJN) joined together to challenge the North Carolina Department of Environmental Quality (NCDEQ) for a failure to respond to citizen complaints. The petition, filed by the UNC Center for Civil Rights on the groups' behalf in the North Carolina Office of Administrative Hearings, alleges NCDEQ failed to respond as required to credible evidence of illegal activity by operators of industrial hog production facilities.

Each year, over 2,000 concentrated animal feeding operations (CAFOs) with capacity to house more than 9 million hogs in North Carolina generate billions of gallons of waste that is laden with nutrients, bacteria, and pathogens. This waste is stored in unlined cesspools which NCDEQ and the industry call “lagoons,” and sprayed onto adjacent fields. The vast majority of swine CAFOs in North Carolina are concentrated in the state’s coastal plain, where sandy soils, frequency of precipitation, and the shallow depth of the water table make land application of waste particularly threatening to water quality and public health.

State permits governing swine CAFOs prohibit land application when the risk of runoff or discharge is heightened, including more than 4 hours after the issuance of a flood watch by the National Weather Service (NWS).

“In advance of both Tropical Storm Hermine and Hurricane Matthew, we captured time-stamped and geo-located images of operators spraying waste more than 4 hours after a flood watch was issued and we reported those violations in complaints to NCDEQ,” said Will Hendrick, with Waterkeeper Alliance. “Additional complaints and evidence were reported verbally to the agency, but it appears those complaints were ignored.”

"NCDEQ has let the people of North Carolina down by failing to act upon credible citizen complaints of illegal activities," said Kemp Burdette, Cape Fear Riverkeeper. "Instead the agency has given industrial animal operations a free pass to break the law and pollute public waterways. This kind of negligence endangers North Carolinians and makes a mockery of environmental regulation in our state."

The failure to investigate is particularly egregious because illegal pollution from swine CAFOs in Eastern North Carolina disproportionately impacts communities of color. Research shows that the percentages of African Americans, Latinos and Native Americans living within three miles of these swine CAFOs are 1.50, 1.41 and 2.22 times higher, respectively, than that of non-Hispanic whites.

"African American, Latino, and Native American communities disproportionately bear the burden of living

near industrial hog operations in Eastern North Carolina. NCDEQ has ignored our continued requests for adequate regulation and monitoring of this industry for years. Their continued failure to investigate complaints filed by members of NCEJN and other impacted community members adds insult to injury for people living with the stench and water contamination caused by swine CAFOs," said NCEJN co-director, Naeema Muhammad.

NCDEQ must stop prioritizing polluters over people. The agency must follow and enforce the law by investigating credible complaints and issuing a "Notice of Violation" where credible evidence shows a violation of the law.

Contact:

Kemp Burdette, Cape Fear River Watch,
, (910) 264-8036
Elizabeth Haddix, UNC Center for Civil Rights,
, (919) 445-0176
Will Hendrick, Waterkeeper Alliance, ,
(212) 747-0622 ext. 162
Naeema Muhammad, NC Environmental Justice Network,
, (252) 314-0703
Maia Raposo, Waterkeeper Alliance, ,
(212) 740-0622 ext. 116

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NCEJN and Allies Respond to Latest Attack by Hog Industry

site

About Waterkeeper

United as one powerful force, Waterkeeper Alliance fights for every community's right to swimmable, drinkable, fishable water. For more information please visit waterkeeper.org

Media Contacts

Maia Raposo

EPA-HQ-2017-00797 E-Files 000046 Wk of 2019-07-29

Volunteer
Become a Waterkeeper
Become a Partner

180 Maiden Lane
Suite 603
New York, NY 10038
(212) 747-0622

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STATE OF NORTH CAROLINA

IN THE OFFICE OF
ADMINISTRATIVE HEARINGS

COUNTY OF (1)_____WAKE_____

(2) NORTH CAROLINA ENVIRONMENTAL JUSTICE NETWORK, WATERKEEPER ALLIANCE, INC, and CAPE FEAR RIVER WATCH PETITIONERS, v. (3) NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY RESPONDENT. (The State agency or board about which you are complaining)	)	**PETITION FOR A CONTESTED CASE HEARING**

We hereby ask for a contested case hearing as provided for by North Carolina General Statute § 150B-23 because the Respondent has:

Repeatedly failed to investigate complaints lodged by Waterkeeper Alliance (WKA), Cape Fear River Watch (CFRW), and residents who are members of the North Carolina Environmental Justice Network (NCEJN) regarding Swine Waste Management General Permit violations. DEQ staff has continually and unlawfully failed to conduct initial assessments of complaints filed by Petitioners. One of the recent complaints was filed on October 7, 2016, which like other complaints before it, was made in writing and in person, and supported by photographs and time stamps showing the permit violations. Unchecked permit violations threaten the environment of North Carolina. NCEJN, which represents and has members who are low-income African American residents of North Carolina, is also harmed by DEQ's failure to investigate, because low-income African American residents of this state are disproportionately harmed by impacts of these violations. Members of WKA and CFRW have a right to have their meritorious, good faith complaints assessed to see whether further investigatory action is warranted.

(4) Amount in controversy $_____ (if applicable)

(If more space is needed, attach additional pages.)

(5) Because of these facts, the State agency or board has: (check at least one from each column)

_____deprived me of property;
_____ordered me to pay a fine or civil penalty; or
____X_otherwise substantially prejudiced my rights;

AND

_____exceeded its authority or jurisdiction;
__X___acted erroneously;
__X___failed to use proper procedure;
__X___acted arbitrarily or capriciously; or
__X___failed to act as required by law or rule.

(6) Date: DECEMBER 6, 2016 _____ (7) Your phone number: (919-445-0176 or 919-445-0178) _____

(8) Print your full address: UNC CENTER FOR CIVIL RIGHTS, 323 West Barbee Chapel Rd. Chapel Hill, NC 27312 _____
(street address/p.o. box) (city) (state) (zip)

(9) Print your name: Elizabeth Haddix and Brent Ducharme, UNC CCR Attorneys for Petitioners

(10) Your signature: _____ _____ by BJD

You must mail or deliver a **COPY** of this Petition to the State agency or board named on line (3) of this form. You should contact the agency or board to determine the name of the person to be served.

CERTIFICATE OF SERVICE

I certify that this Petition has been served on the State agency or board named below by depositing a copy of it with the United States Postal Service with sufficient postage affixed **OR** by delivering it to the named agency or board:

(11) Sam Hayes, General Counsel
(name of person served)

(12) NC Department of Environmental Quality
(State agency or board listed on line 3)

(13) 1601 Mail Service Center,
(street address/p.o. box)

Raleigh, N.C. 27699-1601
(city) (state) (zip code)

(14) This the 6th day of December, 2016.

(15) _____

H-06 (05/10)

(your signature)

When you have completed this form, you **MUST** mail or deliver the **ORIGINAL AND ONE COPY** to the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, NC 27699-6714.

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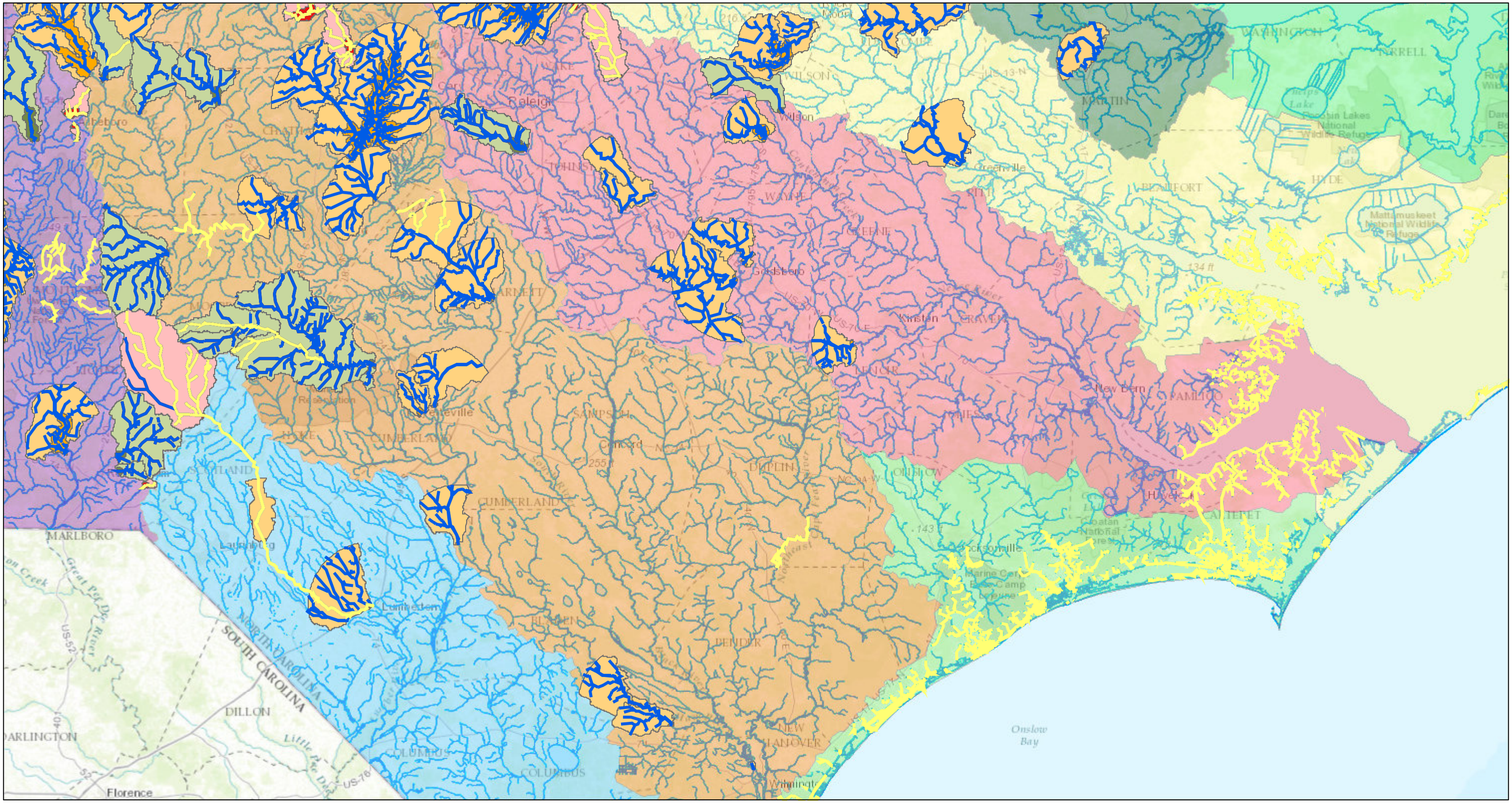
This box for OAH use only.

Amount Paid $_____ Cash – receipt number _____ Money Order Certified Check Attorney Trust Account Check number_____	Indigent (must complete form HOI) Mandated federal cause of action **Received by:**_____

NC Surface Water Classification



September 6, 2016

1:1,155,581

0 12.5 25 50 mi

0 20 40 80 km

Classification_HQW
Classification_WSI
Classification_WSII

dwq_wsws_20141126

WS-II NSWP
WS-IIP
WS-II NSWC
WS-IIC
WS-IIIP
WS-III NSWP
WS-IIIC
WS-III NSWC
WS-IVP
WS_IVP
WS-IV NSWP
WS-IVC
WS_IVC
WS-IV NSWC

Major_Basins

CPF
LBR
NEU
PAS
ROA
TAR
WOK
YAD

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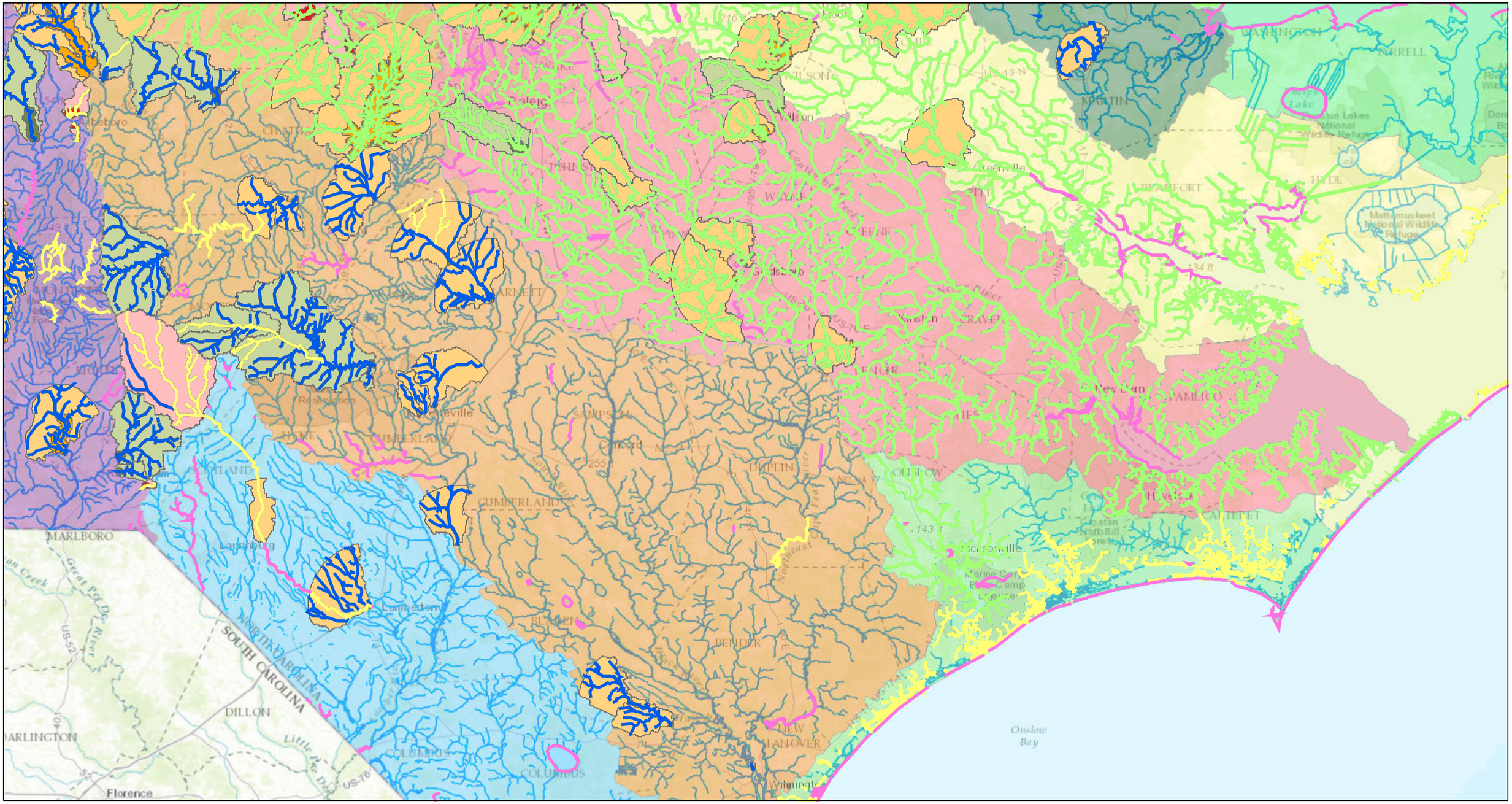

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- Classification_B
- Classification_NSW
- Classification_HQW
- Classification_WSI
- Classification_WSII

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- WS-II NSWP
- WS-IIP
- WS-II NSWC
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- WS-IIIP
- WS-III NSWP
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- WS-III NSWC
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- WS-IV NSWC

Major_Basins

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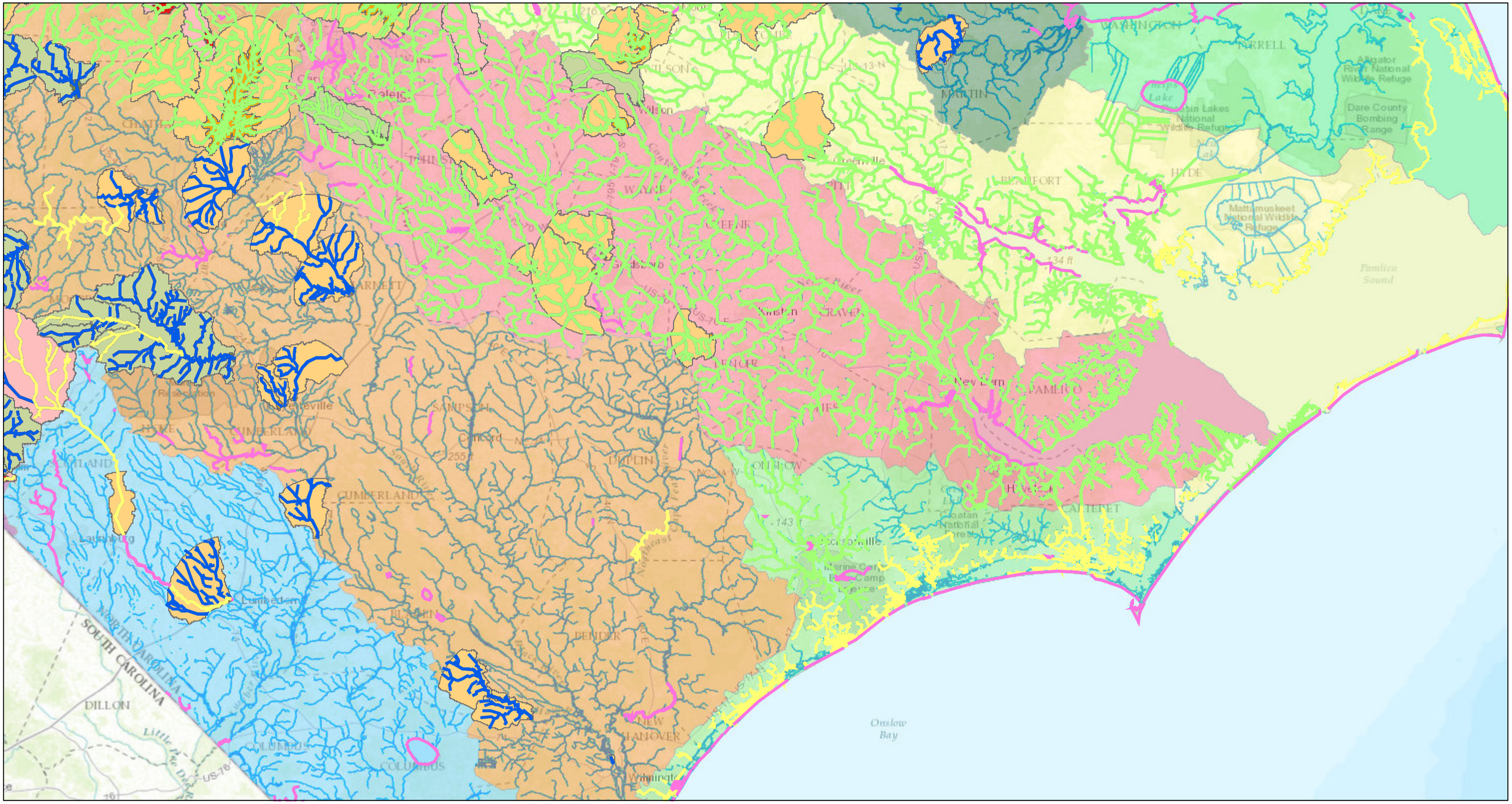

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- WS_IVP
- WS-IV NSWP
- WS-IVC
- WS_IVC
- WS-IV NSWC

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15A NCAC 02T .1307 SWINE WASTE MANAGEMENT SYSTEM PERFORMANCE STANDARDS

(a) This Rule applies to animal waste management systems subject to regulation under G.S. 143-215.10I.

(b) An animal waste management system that serves a swine farm subject to regulation under G.S. 143-215.10I, shall meet all of the following performance standards:

(1) Eliminate the discharge of animal waste to surface waters and groundwater through direct discharge, seepage, or runoff. To meet this standard:

(A) Earthen structures must be designed and constructed with synthetic liners to eliminate seepage.

(B) Solids storage structures shall meet applicable engineering practices and NRCS design standards.

(C) The Certified Animal Waste Management Plan (CAWMP) must meet current NRCS standards for a Comprehensive Nutrient Management Plan (CNMP) as defined by Part 600, Subpart E of the NRCS National Planning Procedures Handbook, which are hereby incorporated by reference, including any subsequent additions or amendments. The handbook may be downloaded at no cost from the NRCS website: http://www.nrcs.usda.gov/technical/afo/cnmp_guide_index.html

(D) Swine waste treatment structures that automatically convey swine waste using pumps must have audible and visible high water alarms with an auto dialer device set to contact the farm owner or farm manager; a gravity overflow to a basin that can contain the flow rate of the largest pump in the system for the maximum amount of time that an operator will not be on-site; or a secondary containment structure designed, constructed, and operated to contain the volume of the largest animal waste treatment structure and the flow rate of the largest pump in the system for the maximum amount of time that an operator will not be on-site.

(E) No more than the equivalent volume of one month of design flow of untreated swine waste shall be accumulated and stored prior to the initiation of treatment.

(2) Substantially eliminate atmospheric emission of ammonia. To meet this standard:

(A) Combined ammonia emissions from swine waste treatment and storage structures may not exceed an annual average of 0.2 kg NH_3-N/wk/1,000 kg of steady-state live weight;

(B) Ammonia emissions from land application sites shall not exceed an annual average of 0.2 kg NH_3-N/wk/1,000 kg of steady-state live weight; and

(C) Ammonia emissions from the swine farm must not exceed an annual average of 0.9 kg NH_3-N/wk/1,000 kg of steady-state live weight.

(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. To meet this standard, swine waste management systems must reduce odor levels, frequency, and duration from the whole farm, such that the requirements of 15A NCAC 02D .1808 are met at the property boundary.

(4) Substantially eliminate the release of disease-transmitting vectors and airborne pathogens. To meet this standard:

(A) Swine waste management systems shall meet the vector attraction reduction requirements in Rule .1107 of this Subchapter for the land application of separated solids and biological residuals.

(B) Swine waste management systems shall meet the pathogen reduction requirements in Rule .1106 of this Subchapter for Class A biosolids that are to be land applied pursuant to Rule .1106(a)(1) or for Class B biosolids that are to be otherwise applied to land.

(C) Fecal coliform concentrations in the final liquid effluent shall not exceed an annual average of 7,000 Most Probable Number/100mL.

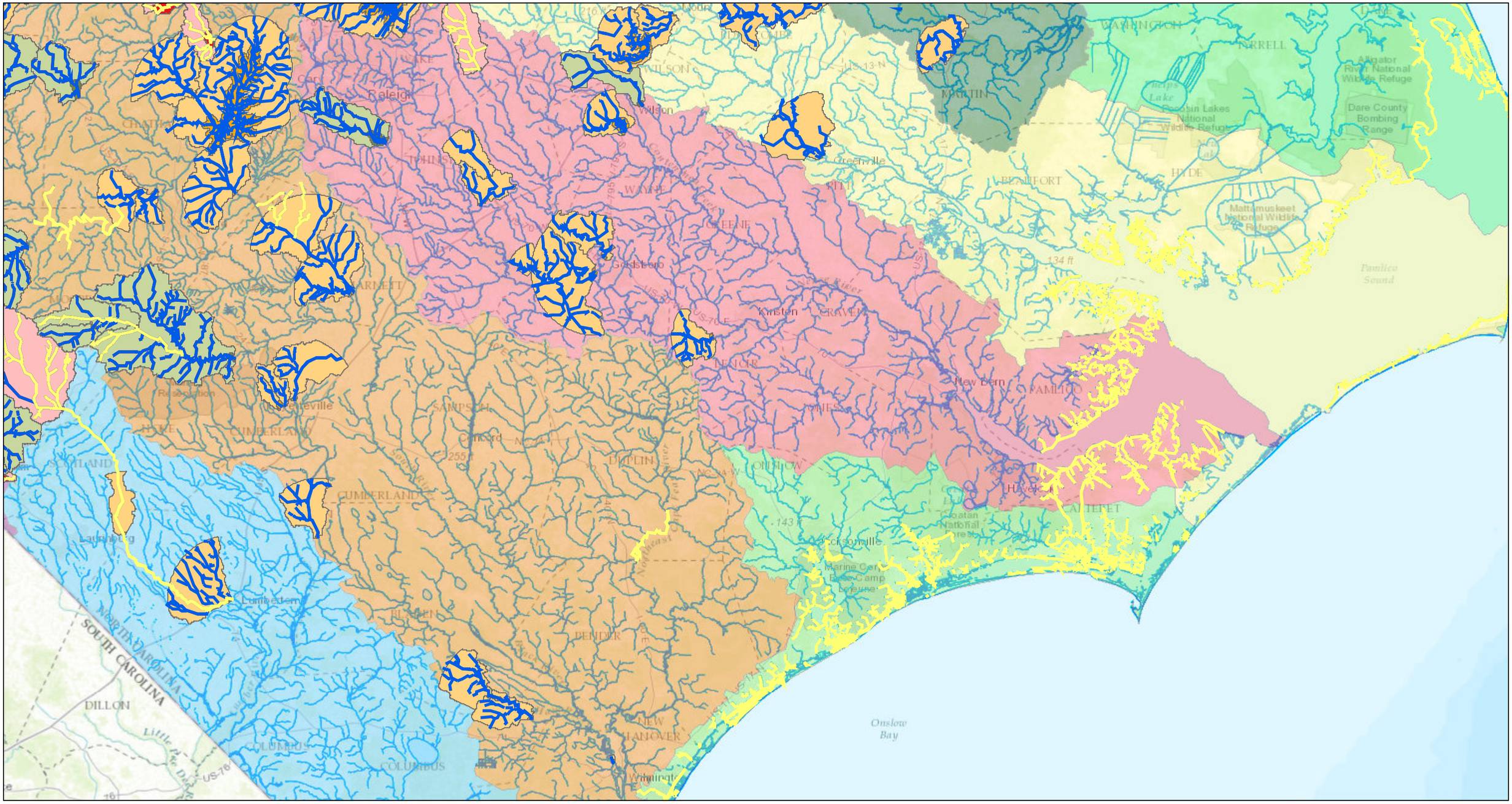
(5) Substantially eliminate nutrient and heavy metal contamination of soil and groundwater. To meet this standard, swine waste management systems that land apply effluent shall:

(A) Meet the current NRCS requirements for a Comprehensive Nutrient Management Plan (CNMP) as defined by Part 600, Subpart E of the NRCS National Planning Procedures Handbook; and

(B) Demonstrate through predictive calculations or modeling that land application of swine waste at the proposed rate will not cause or contribute to a violation of groundwater standards under 15A NCAC 02L.

History Note: *Authority G.S. 143-215.1; 143-215.3(a); 143-215.10A; 143-215.10I; Eff. January 1, 2009.*

NC Surface Water Classification



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Science of the Total Environment 511 (2015) 676–683

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Source tracking swine fecal waste in surface water proximal to swine concentrated animal feeding operations

Christopher D. Heaney [a,b,*], Kevin Myers [c], Steve Wing [d], Devon Hall [e], Dothula Baron [e], Jill R. Stewart [c]

[a] Department of Environmental Health Sciences, Bloomberg School of Public Health, Johns Hopkins University, Baltimore, MD, USA
[b] Department of Epidemiology, Bloomberg School of Public Health, Johns Hopkins University, Baltimore, MD, USA
[c] Department of Environmental Sciences and Engineering, University of North Carolina, Chapel Hill, NC, USA
[d] Department of Epidemiology, University of North Carolina, Chapel Hill, NC, USA
[e] Rural Empowerment Association for Community Help (REACH), Warsaw, NC, USA

HIGHLIGHTS

- We studied the sanitary quality of surface water proximal to swine CAFOs.
- Fecal indicator bacteria levels suggest poor water quality proximal to swine CAFOs.
- Swine-specific Bacteroidales were more prevalent proximal down- vs proximal upstream.
- Swine-specific Bacteroidales can help track fecal waste proximal to swine CAFOs.

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Fecal pollution
E. coli
Enterococcus
Microbial source tracking
Run-off
Water quality

ABSTRACT

Swine farming has gone through many changes in the last few decades, resulting in operations with a high animal density known as confined animal feeding operations (CAFOs). These operations produce a large quantity of fecal waste whose environmental impacts are not well understood. The purpose of this study was to investigate microbial water quality in surface waters proximal to swine CAFOs including microbial source tracking of fecal microbes specific to swine. For one year, surface water samples at up- and downstream sites proximal to swine CAFO lagoon waste land application sites were tested for fecal indicator bacteria (fecal coliforms, *Escherichia coli* and *Enterococcus*) and candidate swine-specific microbial source-tracking (MST) markers (*Bacteroidales* Pig-1-Bac, Pig-2-Bac, and Pig-Bac-2, and methanogen P23-2). Testing of 187 samples showed high fecal indicator bacteria concentrations at both up- and downstream sites. Overall, 40%, 23%, and 61% of samples exceeded state and federal recreational water quality guidelines for fecal coliforms, *E. coli*, and *Enterococcus*, respectively. Pig-1-Bac and Pig-2-Bac showed the highest specificity to swine fecal wastes and were 2.47 (95% confidence interval [CI] = 1.03, 5.94) and 2.30 times (95% CI = 0.90, 5.88) as prevalent proximal down- than proximal upstream of swine CAFOs, respectively. Pig-1-Bac and Pig-2-Bac were also 2.87 (95% CI = 1.21, 6.80) and 3.36 (95% CI = 1.34, 8.41) times as prevalent when 48 hour antecedent rainfall was greater than versus less than the mean, respectively. Results suggest diffuse and overall poor sanitary quality of surface waters where swine CAFO density is high. Pig-1-Bac and Pig-2-Bac are useful for tracking off-site conveyance of swine fecal wastes into surface waters proximal to and downstream of swine CAFOs and during rain events.

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1. Introduction

Hog production in the United States (US) has shifted from numerous small family farms to fewer large vertically integrated concentrated animal feeding operations (CAFOs) (MacDonald and McBride, 2009; Reimer, 2006). In North Carolina (NC) between 1991 and 1998, the number of swine increased from 3.7 million to over 10 million, placing NC as the second leading state in US pork production (Edwards and Ladd, 2000). Since 1998, NC has remained the second leading US pork producer with recent total hog and pig inventory estimates ranging mostly between 8 to 9 million (NCDACS, 2012; USDA, 2007, 2012, 2013, 2014). Swine CAFOs are disproportionately located in the eastern coastal plain region of NC (Wing et al., 2000) and house large numbers of animals whose waste is collected and stored in open-pits called lagoons before the liquid waste is sprayed onto agricultural fields.

* Corresponding author at: Department of Environmental Health Sciences and Department of Epidemiology, Johns Hopkins Bloomberg School of Public Health, Johns Hopkins University, 615 North Wolfe Street, Room W7033B, Baltimore, MD 21205 USA.
E-mail address: cheaney1@jhu.edu (C.D. Heaney).

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According to 2012 county-level estimates of the North Carolina Department of Agriculture and Consumer Services, the top five NC hog-producing counties (Duplin, Sampson, Bladen, Wayne, and Jones) are contiguous and have a population of over 5.6 million swine (NCDACS, 2012). Government officials, agricultural experts, and neighbors of swine CAFOs have expressed concern that this scale of swine production and the associated quantity of manure produced in a small area of land could lead to over-application to agricultural fields and off-site conveyance of fecal pollution and contamination of surface waters (USGAO, 2008).

The NC Department of Environment and Natural Resources (NCDENR) permits swine CAFOs as non-discharge facilities. Swine CAFO permits and regulations include nutrient management plans for the application of liquid waste according to agronomic rates of nutrient uptake of crops grown on the permitted land application spray fields (Edwards and Ladd, 2000; NCGA, 1995). However, questions remain about whether fecal pollution from swine CAFOs in NC can be conveyed off-site of permitted spray fields and whether there are impacts on the sanitary quality of surface waters proximal to swine CAFOs (Jongbloed and Lenis, 1998; Krapac et al., 2002; Thurston-Enriquez et al., 2005).

In 2012, Duplin County, NC had an estimated swine population of 2,040,000 and an estimated poultry population (broiler and other meat-type chickens as well as turkeys) of 88,500,000 (NCDACS, 2012). Because sources of fecal contamination of surface water can be diverse – with numerous potential animal and human inputs – better tools and technologies are needed to track species-specific sources of fecal wastes. Microbial source tracking (MST) methods are designed to improve the identification of sources of fecal contamination (Boehm et al., 2013; Dancer et al., 2014; EPA, 2005). Several candidate swine-specific fecal MST markers have been proposed (Mieszkin et al., 2009; Okabe et al., 2007; Ufnar et al., 2007) with variable specificity and unresolved questions about the generalizability of the markers in different geographic locations (Santo Domingo et al., 2007; Stewart et al., 2013). Application of the proposed microbial source tracking markers to help evaluate management practices in agricultural watersheds has also been limited, although studies in Ontario have used *Bacteroidales* markers to assess livestock exclusion practices (Wilkes et al., 2013) and to compare tile drainage management techniques (Wilkes et al., 2014). Determining whether candidate swine-specific fecal MST markers can be detected in environmental waters in NC, an area with high swine density, is important to assess whether these markers could be useful tools to evaluate and implement best management practices (BMPs).

In this study we aimed to evaluate the impact of swine CAFO liquid waste land application on the sanitary quality of proximal surface waters in NC. The study's specific objectives were to estimate concentrations of fecal indicator bacteria (fecal coliforms, *Escherichia coli*, and *Enterococcus*) in surface waters proximal to swine CAFO liquid waste land application spray fields and to field test candidate MST markers of swine fecal wastes in surface water samples proximal to swine CAFO liquid waste land application sites.

2. Methods

2.1. Study location

Sampling was conducted in the coastal plain region of eastern NC where there is a high density of swine, chicken, and turkey CAFOs as well as beef cattle on pasture. Swine CAFOs typically use liquid waste management systems (lagoons and spray fields), whereas most poultry CAFOs in the area use dry litter waste management systems in which waste-laden litter is applied to fields. Many rural homes in the area use septic systems for sewage disposal. Sampling locations were selected proximal upstream and proximal downstream of three swine CAFO liquid waste land application fields (Sites 1–3), where streams could be sampled from a public right-of-way. We use the letters A and B to denote proximal upstream and proximal downstream locations, respectively, at each swine CAFO surface water sampling site; however, "A"

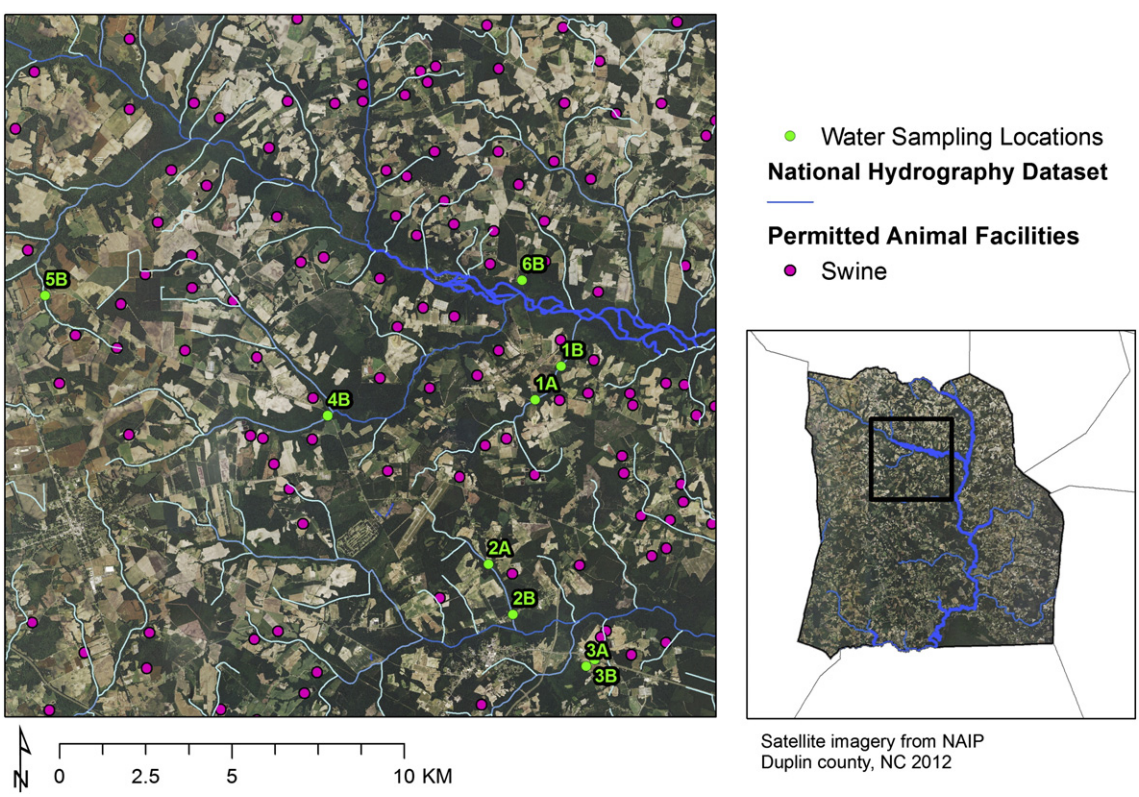

Fig. 1. Map of surface water sampling sites proximal to swine concentrated animal feeding operation spray fields, North Carolina.

sampling locations were proximal and downstream of numerous other swine CAFOs. We could not identify accessible sampling locations in the study watersheds where there were no upstream swine CAFOs.

2.2. Sample collection

A total of 187 surface water samples were collected via weekly sampling for six months (from mid-February to mid-August 2010) and monthly sampling (from mid-September 2010 to mid-January 2011) to capture seasonal trends. Surface water samples were collected from public access waters proximal to swine CAFO liquid waste land application sites (Fig. 1). Seventy six samples were collected at Site A (proximal upstream) locations and 109 at Site B (proximal downstream) locations (2 samples were missing site A/B designations). Sterile 4-liter Nalgene bottles were used for collection after they were washed and autoclaved for 15 minutes at 121 °C. Sample bottles were coded so that sample processors were blinded during laboratory analysis. After collection, samples were transported on ice. All samples were analyzed for fecal coliform bacteria within 24 hours of sample collection. Known-source fecal waste samples (swine lagoon, swine wallow-water, swine feces, and other animal feces) were collected in sterile containers and transported to the laboratory in coolers on ice for analyses. Rainfall data were obtained from a State Climate Office of North Carolina weather station within 27–47 km of the sampling locations. Hourly increments of rainfall (inches) were combined to tabulate the cumulative amount of rain (inches) that fell during the 24 and 48 hours before sampling.

2.3. Fecal indicator bacteria estimates

Fecal indicator bacteria were quantified using standard membrane filtration techniques (APHA, 2006). Fecal coliforms were quantified by membrane filtration using modified fecal coliform (mFC) agar. *Enterococcus* were quantified by EPA method 1600 using modified mE medium (mEI) containing the chromogenic substrate indoxyl-beta-D-glucoside (EPA, 2009a). *E. coli* were quantified by EPA method 1603 using modified m-TEC media (EPA, 2009b). Negative controls were included in each membrane filtration analysis. Samples were filtered in dilutions to obtain counts in the 30–300 colony forming units (CFU)/100 mL range. To test reproducibility of fecal indicator bacteria methods within the laboratory, samples were filtered in duplicate 20% of the time, or every fifth set of samples. All duplicates were within an order of magnitude of each other.

2.4. Swine fecal microbial source-tracking (MST) markers

To examine DNA in each surface water sample, 500 mL of water was filtered using a 0.22 μm Durapore® (Millipore, Billerica, MA) membrane. Excess filter paper, i.e. paper that was not exposed to the sample, was cut aseptically and discarded before placing the filter in a PowerBead tube to extract DNA using the PowerSoil™ DNA Isolation Kit (MO BIO Laboratories, Inc., Carlsbad, CA) following the manufacturer's instructions. Similarly, this kit was used to extract DNA from 0.5 g of each known-source fecal sample with use of provided PowerBead tubes, as recommended by the manufacturer. Swine lagoon and wallow water samples were collected in sterile centrifuge bottles and 250 mL of liquid were centrifuged at 3000 ×*g* for 20 minutes. The supernatant was removed to allow access to the pellet, and 0.5 g of the pellet was placed into a PowerBead tube. Instead of utilizing the MO BIO Vortex Adapter tube holder to vortex the PowerBead tubes for 10 minutes as recommended by the manufacturer, the PowerBead tubes were vortexed using the high energy Mini-Beadbeater (BioSpec Products, Bartlesville, OK) for one minute. DNA extractions were stored at −80 °C and were used for multiple PCR assays.

A series of PCR assays were performed for swine-specific markers. PCR assays for Pig-1-Bac and Pig-2-Bac were performed using a Qiagen QuantiTect Probe PCR kit and the Pig-Bac-2 and P23-2 assays were performed using 5 PRIME MasterMix with the appropriate amount of deionized water and primers according to manufacturer's instructions (Supplemental Table S1). Reactions for Pig-1-Bac and Pig-2-Bac assays were conducted in duplicate using primers and probes described by Mieszkin et al. (2009) using a Cepheid Smart Cycler model SC1000-1. Although Pig-1-Bac and Pig-2-Bac assays were run on a real-time machine quantitative results are not reported because: (1) a standard curve was not consistently run so we are not confident reporting quantitative results; and (2) we wanted to be consistent in our reporting across the assays. Reactions for Pig-Bac-2 and P23-2 assays were performed in duplicate as described by Okabe et al. (2007) and Ufnar et al. (2007), respectively. Reactions were carried out using an Eppendorf MasterCycler gradient thermal cycler; then products were visualized on a 1.5% agarose gel. All assays were performed with negative controls. An internal amplification control (IAC) for the P23-2 assay was used as described by Ufnar et al. (2007). This IAC was also tested to determine the lower limit of detection (10^{-5} μM). For the *Bacteroidales* PCR assays, extracts from a positive lagoon sample and two pig fecal samples were used as positive controls. The same samples were consistently used as positive controls, although multiple extracts were utilized from the samples over the course of the study.

A separate PCR assay using salmon sperm DNA was performed to test for inhibition in each DNA extract (Haugland et al., 2005). A known amount of salmon sperm DNA was injected into each DNA extract as well as a positive control. Duplicate PCRs were performed using a Qiagen QuantiTect Probe PCR kit in a Cepheid Smart Cycler model SC1000-1. The sample was considered inhibited if the difference of cycle threshold (C_T) between extract and control was greater than 3.3. If inhibited, the DNA extract was diluted tenfold and tested for inhibition again. Once an extract was considered to not be inhibited, it was retested for the four swine assays: Pig-1-Bac, Pig-2-Bac, Pig-Bac-2, and P23-2.

To examine the sensitivity and specificity of the four candidate swine-specific fecal microbial source-tracking markers, we tested pig fecal (n = 6), pig wallow water (n = 2), pig waste lagoon (n = 7) as well as chicken (n = 6), turkey (n = 3), goat (n = 2), cow (n = 4), horse (n = 1) and human (n = 3) fecal samples collected from sites in NC. Sensitivity of each of the four candidate swine-specific fecal microbial source-tracking markers was calculated as the proportion of known-source swine fecal samples that tested positive for each marker. Specificity was calculated as the proportion of known-source non-

Table 1
Fecal coliform, *E. coli*, and *Enterococcus* concentrations (CFU/100 mL) in surface waters at A and B sites proximal to swine concentrated animal feeding operation spray fields in North Carolina.

	Fecal coliforms (CFU/100 mL)				*E. coli* (CFU/100 mL)				*Enterococcus* (CFU/100 mL)			
	N	Range	Geo. mean	*p*-Value[a]	N	Range	Geo. mean	*p*-Value[a]	N	Range	Geo. mean	*p*-Value[a]
All A sites 1–3	76	0.5, 9091	111		76	0.4, 2090	78		75	1, 8517	89	
All B sites 1–3	76	0.5, 140,000	187	0.09	76	1, 5400	106	0.22	75	1, 10,400	103	0.64
All B sites 4–6	33	10, 117,273	331	–	33	10, 3167	121	–	33	10, 4267	220	–

Note. Site A = proximal upstream sampling location. Site B = proximal downstream sampling location. CFU = colony forming unit.
[a] T-test statistic from fixed-effects generalized linear regression model to account for repeated measures at each site.

swine fecal samples (i.e., chicken, turkey, goat, cow, horse, human) that tested negative for each marker.

2.5. Statistical analysis

Descriptive statistics were calculated for each of the fecal indicator bacteria estimates in surface water. T-test statistics were estimated using conditional fixed-effects linear regression models to account for repeated sampling at each site (Allison, 2005). Estimates of the concentration of each fecal indicator bacteria were compared to recommendations set by the North Carolina Department of Environment and Natural Resources (DENR) Division of Water Quality (DWQ) "Redbook" (NCDENR, 2007) and the United States Environmental Protection Agency (EPA) recreational water quality guideline values (EPA, 2012). We calculated the proportion of samples that exceeded state (NCDENR, 2007) and federal (EPA, 2012) recreational fresh water quality guideline values by tabulating the number of samples greater than 200 CFU/100 mL, 235 CFU/100 mL, and 70 CFU/100 mL for fecal coliforms, *E. coli*, and *Enterococci*, respectively. Exact chi-square tests were calculated to compare the frequency of exceedance of each water quality criterion by CAFO sampling site and by B versus A site. Odds ratios (OR) and 95% confidence intervals (CI) were estimated using conditional fixed-effects logistic regression models to account for repeated sampling at each site (Allison, 2005).

To quantitatively compare concentrations of fecal indicator bacteria at A and B locations within Sites 1–3, the mean and 95% confidence interval were calculated for each fecal indicator's pair-wise difference of Site B minus Site A concentrations by site. A positive mean value indicates that the concentration of fecal indicator bacteria was higher at the Site B compared to Site A location. A negative mean value indicates the concentration of a fecal indicator was lower at the B site compared to the A site at each water sampling location.

The frequency of detection of candidate MST markers was tabulated across all sites and by site. Exact chi-square tests were calculated to compare the frequency of detection of candidate MST markers by site. Fixed effects linear and logistic regression models were used to estimate associations between fecal indicator bacteria, presence of swine markers, and rainfall (Allison, 2005). Cumulative rainfall during the 24 and 48 hours before sample collection was considered in analyses with fecal indicator bacteria and MST markers as a continuous (inches) and a binary (>versus ≤ the mean of cumulative inches of rainfall) variable.

Because this is not a randomized study, statistical significance cannot be interpreted as the probability that an observed difference would occur by chance if there is truly no difference between groups being compared. However, *p*-values are presented so that results can be easily compared with other studies. Fecal indicator bacteria concentrations were $\log_{10}$-transformed prior to analysis. All statistical analyses were performed using SAS version 9.2 (SAS Institute Inc., Cary, NC).

3. Results

3.1. Fecal indicator bacteria concentrations in surface waters proximal to swine CAFOs

The highest maximum concentrations of fecal coliforms, *E. coli*, and *Enterococci* observed were 140,000, 5400 and 10,400 CFU/100 mL, respectively, and were measured at Site B locations (Table 1). In general, the Site B samples had higher geometric mean and maximum fecal indicator bacteria values compared to Site A samples (Table 1). The highest concentrations of fecal indicator bacteria were detected in the spring and summer months (Fig. 2a-c).

3.2. Exceedance of recreational water quality guideline values proximal to swine CAFOs

For fecal coliforms, *E. coli*, and *Enterococcus*, 74/187 (40%), 43/187 (23%), and 112/185 (61%) of all surface water samples exceeded the respective recreational water quality guideline values of 200 CFU/100 mL, 235 CFU/100 mL, and 70 CFU/100 mL (Table 2). Across Sites 1–3, recreational water quality guideline value exceedance was 1.86 (95% confidence interval (CI) = 0.96, 3.62), 1.73 (95%

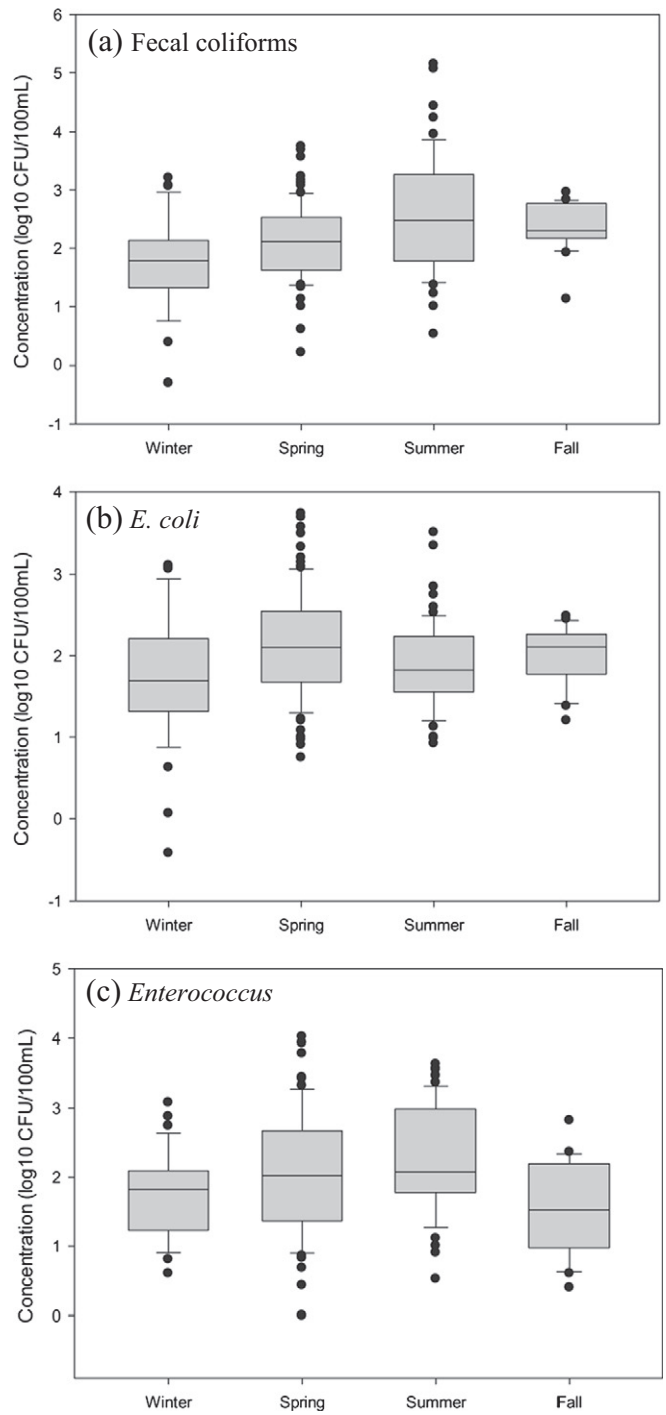

Fig. 2. a–c. Boxplot comparison of concentrations ($\log_{10}$ CFU/100 mL) of: (a) fecal coliforms (b) *E. coli* and (c) *Enterococcus* by season for all surface water samples at sites proximal to swine concentrated animal feeding operation spray fields in North Carolina. Median line and interquartile range depicted by boxes; range depicted by whiskers; outliers depicted by circular dots.

CI = 0.79, 3.78), and 1.49 (95% CI = 0.77, 2.88) times as prevalent at Site B compared to Site A locations (Table 2). For each of the fecal indicator bacteria, the greatest frequency of exceedance of recreational water quality guideline values was observed in the summer, followed by the spring (data not shown).

3.3. Mean pair-wise differences in fecal indicator concentrations

Across Sites 1–3, the means of the pair-wise differences (Site B value minus Site A value) for all three fecal indicator bacteria were positive (greater than the null value of mean equal to zero) (Table 3). The site-specific pair-wise differences were all positive except for *E. coli* at Site 3 and *Enterococcus* at Site 2 (Table 3). These two negative values were the smallest absolute differences in means observed.

3.4. Swine-specific fecal microbial source tracking markers in surface water proximal to swine CAFOs

The sensitivity of the three *Bacteroidales* markers Pig-1-Bac, Pig-2-Bac and Pig-Bac-2 was 80%, 87%, and 93%, respectively. The methanogen candidate swine-specific marker P23-2 was not detected in any of the known-source samples (while its internal amplification control was observed in every reaction). The specificities of Pig-1-Bac, Pig-2-Bac, and Pig-Bac-2 were 100%, 100%, and 37%, respectively.

The two *Bacteroidales* markers with 100% specificity for swine fecal pollution, Pig-1-Bac and Pig-2-Bac, were detected in 17% and 14% of surface water samples, respectively (Table 4). Pig-1-Bac was present each time Pig-2-Bac was detected and was also detected in six more samples than Pig-2-Bac. At sites where both A and B samples were collected (Sites 1–3), the difference in detection frequency at B compared to A sites was pronounced (Table 4). The odds of detecting the swine-specific fecal *Bacteroidales* marker Pig-1-Bac at Site B locations was 2.47 (95% CI = 1.03, 5.94) times the odds at Site A locations (Table 4). Site 1 demonstrated the most prominent difference in detection frequency between Site B and Site A (Pig-1-Bac OR = 6.76; 95% CI = 1.12, 40.8). The only instance in which the frequency of detection was higher at Site A than Site B was at Site 2 for *Bacteroidales* Pig-Bac-2. But Pig-Bac-2 was not a specific microbial source tracking marker for swine fecal waste. At Site 2, the two swine specific fecal *Bacteroidales* microbial source-tracking markers (Pig-1-Bac and Pig-2-Bac) were never detected at the Site A location. The swine-specific *Bacteroidales* markers Pig-1-Bac and Pig-2-Bac were most prominent during the winter (n = 32) months, with a detection frequency of 59% and 53%, respectively (data not shown). Pig-1-Bac and Pig-2-Bac were detected less frequently (15% and 10%, respectively) during the spring (n = 73) and were not detected during the summer (n = 62) and fall (n = 17) (data not shown).

3.5. Relation of rainfall with fecal indicator bacteria and swine-specific fecal microbial source tracking markers

In the 48 hours preceding sampling, the maximum cumulative inches of rainfall was 2.94 inches (Table S2). Mean fecal coliform, *E. coli* and *Enterococcus* levels increased as antecedent cumulative rainfall increased (Fig. 3; Table S3). Fecal coliforms, *E. coli*, and *Enterococcus* concentrations ($\log_{10}$ CFU/100 mL) increased 0.29 (95% confidence interval [CI] = 0.09, 0.49), 0.45 (95% CI = 0.27, 0.59), and 0.50 (95% CI = 0.31, 0.69), respectively, for every one-inch increase in cumulative rainfall in the 48 hours before sample collection, adjusting for season (Table S3).

Across all sites, the swine-specific fecal microbial source tracking markers Pig-1-Bac and Pig-2-Bac were detected more frequently when 48 hour antecedent cumulative rainfall (inches) was greater than versus less than or equal to the mean (Table 5). The odds of detecting Pig-1-Bac during time periods when 48 hour antecedent cumulative rainfall was greater than the mean were 2.87 times (95% CI = 1.21, 6.80) the odds during time periods when 48 hour antecedent cumulative rainfall was less than or equal to the mean (Table 5). Fecal indicator bacteria concentrations were not observed to be associated with swine-specific fecal microbial source tracking markers Pig-1-Bac and Pig-2-Bac (data not shown).

4. Discussion

The results of our study suggest an overall diffuse and poor microbial quality of surface waters proximal to swine CAFO liquid waste land application sites in NC, the second largest hog-producing state in the US. Fecal indicator bacteria were detected at concentrations that exceeded federal and state recreational water quality guideline values, with the highest concentrations observed immediately downstream of swine CAFO spray fields and in the spring and summer seasons. While some mean differences in fecal indicator bacteria were detected at Site A (proximal upstream) and Site B (proximal downstream) surface water sampling locations (e.g., higher Site B maximum values; positive mean pair-wise difference values; higher frequency of exceedance of fecal indicator guideline values at Site B compared to Site A locations), fecal indicator bacterial contamination was observed at both A and B locations.

While the study design allowed a comparison of Site A (upstream) and Site B (downstream) locations proximal to swine CAFO liquid waste land application sites, it is important to note that the Site A locations did not represent pristine non-impacted sites. Because the study sites in eastern NC were located among one of the top hog-dense counties in the US (Feedstuffs, 2013a,b; USDA, 2007), the Site A (proximal upstream) locations in our study were potentially influenced by numerous upstream swine CAFO liquid waste land application sites as well as poultry CAFO dry litter land application sites. Because fecal indicator bacteria (fecal coliforms, *E. coli*, *Enterococcus*) are non-specific indicators

Table 2
Frequency of exceedance of recreational water quality guideline values for fecal coliforms, *E. coli*, and *Enterococcus* at A and B sites proximal to swine concentrated animal feeding operation spray fields in North Carolina.

	Fecal coliforms (200 CFU/100 mL)[a]		*E. coli* (235 CFU/100 mL)[b]		*Enterococcus* (70 CFU/100 mL)[b]	
	N exceed/total (%)	OR (95% CI)[c]	N exceed/total (%)	OR (95% CI)[c]	N exceed/total (%)	OR (95% CI)[c]
All sites	74/187 (40)	–	43/187 (23)	–	112/185 (61)	–
All A sites 1–3	24/76 (32)	Ref	13/76 (17)	Ref	40/75 (53)	Ref
All B sites 1–3	35/76 (46)	1.86 (0.96, 3.62)	20/76 (26)	1.73 (0.79, 3.78)	47/75 (63)	1.49 (0.77, 2.88)
All B sites 4–6	15/33 (46)	–	10/33 (30)	–	25/33 (76)	–

Note. Site A = proximal upstream sampling location. Site B = proximal downstream sampling location. OR = odds ratio. CI = confidence interval.
CFU = colony forming unit. Ref = referent category.
[a] Based on North Carolina Department of Environment and Natural Resources surface water standards (NCDENR, 2007).
[b] Based on 2012 USEPA recreational water quality criteria beach action values (BAV) (EPA, 2012).
[c] Odds ratio and 95% confidence interval derived from fixed-effects logistic regression model to account for repeated measures at each site.

Table 3
Mean of pair-wise differences of fecal indicator bacteria concentrations (CFU/100 mL) in surface waters at B sites minus A sites proximal to swine concentrated animal feeding operation spray fields in North Carolina.

	Fecal coliforms			*E. coli*			*Enterococcus*		
	CFU/100 mL			CFU/100 mL			CFU/100 mL		
	N[a]	Mean[b]	95% CI	N[a]	Mean[b]	95% CI	N[a]	Mean[b]	95% CI
All sites 1–3	75	2266	−1180, 5712	75	129	−49, 307	74	89	−103, 281
Site 1	13	384	−357, 1125	13	504	−347, 1355	13	341	−145, 827
Site 2	31	4387	−3886, 12,660	31	117	−83, 317	30	−32	−350, 286
Site 3	31	934	−228, 2096	31	−19	−156, 118	31	99	−177, 375

Note. Site A = proximal upstream sampling location. Site B = proximal downstream sampling location. CI = confidence interval.
[a] Number of pair-wise samples.
[b] Mean of the pair-wise differences of concentrations of each fecal indicator bacteria (B sites minus A sites).

of fecal pollution – reflecting inputs from diverse fecal waste inputs, including hog and poultry CAFOs as well as other diffuse sources – this could account for the elevated levels of fecal indicator bacteria at Site A (proximal upstream) compared to Site B (proximal downstream) locations.

Bacteriodales markers Pig-1-Bac and Pig-2-Bac, which were developed and validated in other regions of the world, were tested against known-source swine and other animal fecal samples from NC and both showed a specificity of 100% to known-source swine fecal wastes. This supports the findings of Mieszkin et al. (2009) who also observed specificities of 100% for both markers in France. The lower sensitivity of Pig-1-Bac (80%) and Pig-2-Bac (87%) than observed in France (98–100%) may be explained by our inclusion of swine wallow water as a potential source of swine waste, which was not investigated in the French study (Mieszkin et al., 2009). Exclusion of these swine wallow water samples (which tested negative) would have resulted in a higher sensitivity for Pig-1-Bac (92%) and Pig-2-Bac (100%).

This is the first study to examine whether Pig-1-Bac and Pig-2-Bac would be appropriate as indicators of swine-specific fecal waste runoff under field conditions at ambient surface water locations proximal to swine CAFO liquid waste land application sites in NC. The presence of swine-specific Pig-1-Bac and Pig-2-Bac fecal MST markers off-site in these surface waters indicates that swine CAFO liquid waste land application practices in NC can lead to off-site migration of swine fecal wastes. Our observation that Pig-1-Bac was 2.47 times as prevalent at proximal downstream compared to proximal upstream sampling locations also suggests that fecal wastes from swine CAFO liquid waste land application sites can negatively influence proximal downstream surface water quality.

During our study period, the maximum cumulative rainfall 48 hours antecedent to sampling was 2.94 inches (Table S2), which is not suggestive of heavy rainfall conditions. The low amount of rainfall during our study is relevant to the NC regulatory framework because it requires that animal waste management systems "not cause pollution in the waters of the State, except as may result because of rainfall from a storm event more severe than the 25-year, 24-hour storm" (NCGA, 1995). Neighbors and community groups in NC have observed swine CAFO operators spraying before forecasted rainfall and also during rain events to avoid an overflow or breach of waste lagoons.

Rainfall was strongly associated with fecal indicator bacteria concentrations in our study – particularly *E. coli* and *Enterococcus* – which is consistent with a loading mechanism of increasing fecal indicator bacteria levels in surface waters during rainfall-induced run-off. Future studies should employ a sampling strategy to capture the effects of rainfall through targeted sampling at multiple time points during storm events to characterize the temporal dynamics of fecal pollution loading during run-off conditions. Future studies should also target specific swine liquid waste spraying events — i.e., sampling at times during and after swine liquid lagoon wastes are sprayed onto fields.

Rainfall was strongly associated with the frequency of detection of Pig-1-Bac and Pig-2-Bac MST markers. Pig-1-Bac and Pig-2-Bac were detected roughly three times as frequently during periods when cumulative antecedent 48 hour rainfall was greater than versus less than or equal to mean rainfall. This association between rainfall and swine-specific MST markers Pig-1-Bac and Pig-2-Bac provides evidence of a rainfall-induced loading mechanism of swine fecal wastes in surface waters proximal to and off-site of swine CAFO liquid waste land application sites. However, the sample size was too small to draw conclusions about rainfall-swine MST marker associations at Site B (proximal downstream) compared to Site A (proximal upstream) locations.

Concentrations of fecal indicator bacteria and exceedances of recreational water quality guideline values were not associated with the presence of swine MST markers (data not shown). Because fecal indicator bacteria reflect both point and non-point sources of fecal pollution from warm-blooded animals as well as other non-fecal sources (e.g., bacterial re-growth in the environment (Byappanahalli et al., 2006)), it is not surprising that these measures were observed to be poor predictors of MST markers specific to swine fecal wastes.

Mieszkin et al. (2009) reported that Pig-2-Bac was a more suitable marker than Pig-1-Bac because it was detected more frequently in water samples. Our field assessment in NC slightly contradicts these findings because we detected Pig-1-Bac in six samples in which Pig-2-Bac was not detected, while Pig-2-Bac was never detected in the absence of Pig-1-Bac. Our results suggest that it may be advisable to utilize both markers together, as protocols involving two PCR assays from the same DNA extract do not involve much additional cost or effort compared to protocols involving one PCR assay.

Table 4
Occurrence of two swine-specific fecal *Bacteroidales* microbial source tracking markers in surface water samples at A and B sites proximal to swine concentrated animal feeding operation spray fields in North Carolina.

	Pig-1-Bac		Pig-2-Bac	
	N pos./total (%)	OR (95% CI)[a]	N pos./total (%)	OR (95% CI)[a]
All sites	31/182 (17)	–	25/182 (14)	–
All A sites 1–3	10/74 (14)	Ref	8/74 (11)	Ref
All B sites 1–3	20/75 (27)	2.47 (1.03, 5.94)	16/75 (21)	2.30 (0.90, 5.88)
All B sites 4–6	1/33 (3)	–	1/33 (1)	–

Note. Site A = proximal upstream sampling location. Site B = proximal downstream sampling location. OR = odds ratio. CI = confidence interval.
[a] Odds ratio and 95% confidence interval derived from fixed-effects logistic regression model to account for repeated measures at each site.

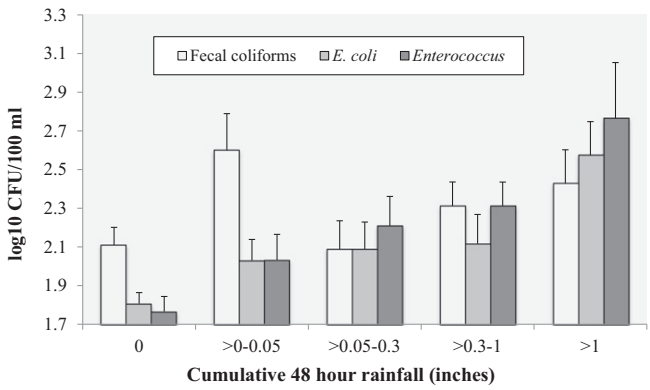

Fig. 3. Mean fecal indicator bacteria concentrations (log10 CFU/100 mL) by cumulative amount of rainfall (inches) during the 48 hours prior to sampling at sites proximal to swine concentrated animal feeding operation spray fields in North Carolina. Error bars represent the standard error of mean fecal indicator bacteria concentrations.

It is possible that swine fecal wastes were present in surface water samples when Pig-1-Bac and Pig-2-Bac were not detected. Sensitivity below 100% indicates that the MST marker was not detected in all known-source swine fecal waste samples. Furthermore, the persistence of these *Bacteriodales* MST markers (which are based upon anaerobic bacteria) is not well understood under ambient surface water conditions. A study of the effect of oxygen and temperature on the persistence of Pig-1-Bac and Pig-2-Bac reported a one-log reduction of the markers after eight to ten days in microcosms at 20 °C under aerobic conditions (Marti et al., 2011).

The seasonal variability of Pig-1-Bac and Pig-2-Bac in this study was somewhat surprising considering Mieszkin et al. (2009) reported temporal stability of Pig-1-Bac and Pig-2-Bac over a 48-month period. However, Mieszkin et al. (2009) likely meant that the markers were stable from year to year, as they did include enough samples to test seasonal differences. Recent research has established that lower temperatures result in slower *Bacteroidales* 16S rRNA gene decay (Bell et al., 2009; Schulz and Childers, 2011). Because Pig-1-Bac and Pig-2-Bac may persist in colder environments and decay more rapidly in warmer environments, it is possible that they were either absent in the environmental samples collected in NC during the warmer months, or were present at levels below the assay detection threshold. The warmer temperatures in NC could explain why these markers were not detected throughout the year.

This seasonal pattern, where the swine-specific MST markers were detected more frequently in winter, is in direct contrast to the typical seasonal pattern observed for fecal indicator bacteria. In this study and elsewhere (Cha et al., 2010; Tiefenthaler et al., 2009; Wilson et al., 2007), measures of fecal indicator bacteria in water are typically higher in warmer (summer) than in colder (winter) months. This marked difference in seasonal patterns is most likely attributable to the fact that traditional measures of fecal indicator bacteria are culture-based and target vegetative bacterial cells accustomed to growing in the warm environment of mammalian guts. Microbial source tracking markers, on the other hand, typically rely on detection of DNA specific to the cells of anaerobic bacteria. Both the cells and the DNA degrade more quickly in warm weather, likely causing lower frequencies of their detection in summer months (Schulz and Childers, 2011). Rainfall, which was higher during the spring and summer months of our study, may also contribute to the observed seasonal pattern of Pig-1-Bac and Pig-2-Bac presence.

The low specificity of Pig-Bac-2 (37%) demonstrates that this marker was not useful to distinguish swine from other animal sources of fecal waste. This marker had a low specificity because it was detected in chicken, cow, goat, horse, human, and turkey fecal samples. To our knowledge no other study has investigated the sensitivity and specificity of Pig-Bac-2 since publication of the assay, which included test samples from humans, cows and swine (Okabe et al., 2007). Lamendella et al. (2009) also observed a poor specificity of Pig-Bac-1, the other swine *Bacteroidales* marker proposed by Okabe et al. (2007), because it was detected in cattle, human, chicken, raccoon, and horse fecal samples. Since we did not detect Methanogen P23-2 in any known source sample (swine or other animal) or in any surface water samples, it appears to have limited utility for detecting swine waste in surface water samples in NC.

Several study limitations should be considered. We did not sample known-source swine fecal wastes from the lagoons of the swine CAFOs proximal to our selected surface water sampling sites. Future studies could improve understanding of off-site transport through on-site sampling of swine CAFOs spray-field run-off and of lagoon waste in addition to the proximal surface waters. We did not generate quantitative PCR results for Pig-1-Bac and Pig-2-Bac. Although assays were run on a real-time PCR machine, materials for a standard curve were not available and cycle threshold values were not recorded, which restricted analysis of these markers to their presence versus absence. Due to the high density of swine and other animal CAFOs in the study area we were unable to sample at un-impacted or pristine upstream sites. Future studies should attempt to include such un-impacted sites and also consider use of additional microbial source tracking markers to evaluate the relative contribution of swine versus other animal sources (e.g., chicken, turkey, human) of fecal pollution.

5. Conclusions

Evidence of high concentrations of fecal indicator bacteria and the presence of swine-specific fecal MST markers in surface waters proximal to swine CAFO liquid waste land application sites is relevant to evaluating the effectiveness of current technologies and policies for protecting the sanitary quality of surface waters proximal to swine CAFOs. These results could inform management decisions about liquid waste disposal practices, particularly landscapes where swine density is high and that are susceptible to over-land run-off from rainfall and flooding (e.g., NC coastal plain) (Wing et al., 2002). Use of swine-specific fecal MST markers Pig-1-Bac and Pig-2-Bac could help identify surface waters for targeted restoration, and help inform rules governing permitting, waste management (including storage,

Table 5
Relation between occurrence of swine-specific fecal *Bacteroidales* microbial source tracking markers in surface water samples and cumulative rainfall in the 48 hours before sample collection at sites proximal to swine concentrated animal feeding operation spray fields in North Carolina.

	Pig-1-Bac		Pig-2-Bac	
	N pos./total (%)	OR (95% CI)[a]	N pos./total (%)	OR (95% CI)[a]
All sites				
Cum. rainfall ≤ mean[b]	16/131 (12)	Ref	12/131 (9)	Ref
Cum. rainfall > mean[b]	15/53 (28)	2.87 (1.21, 6.80)	13/53 (25)	3.36 (1.34, 8.41)

Note. OR = odds ratio. CI = confidence interval.
[a] Odds ratio and 95% confidence interval derived from fixed-effects logistic regression model to account for repeated measures at each site.
[b] Stratified by time periods > vs ≤ the mean cumulative inches (0.248) of rainfall in the 48 hours before sample collection.

treatment, and disposal), and swine stocking density. Future studies should utilize swine-specific *Bacteroidales* fecal MST markers as they appear to represent important tools to advance understanding of impacts on water quality in areas with intensive swine production.

Abbreviations

CAFO	concentrated animal feeding operation
CFU	colony forming unit
PCR	polymerase chain reaction

Author contributions

The manuscript was written through contributions of all authors. All authors have given approval of the final version of the manuscript.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at http://dx.doi.org/10.1016/j.scitotenv.2014.12.062.

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Ninth Senate Bill (SB) 1217 Interagency Group Guidance Document
September 25, 2009

In an effort to address questions from technical specialists and provide uniform interpretations to technical specialists regarding the requirements of the animal waste management rules, the 1996 session of the General Assembly created an interagency committee. The SB 1217 Interagency Group consists of two (2) representatives from each of the following agencies: the Division of Soil and Water Conservation (DSWC); the Division of Water Quality (DWQ), the Department of Agriculture (NCDA&CS); and Cooperative Extension Service (NCCES), and the Natural Resources Conservation Service (NRCS), United States Department of Agriculture.

The foundation for this Guidance Document is the previous Guidance Documents developed by the agencies represented on SB 1217 dated June 20, 1995, May 3, 1996, August 9, 1996, January 2, 1997, May 21, 1997, August 18, 1997, the Sixth Guidance Memo, Revision One (January 8, 1998), Revision Two (August 25, 1998), Revision Three (October 29, 1998), Revision Four (April 12, 1998), Revision Five (January 12, 2000), the Seventh Guidance Memo (January 9, 2001), Revision One (March 26, 2003), Revision Two (June 30, 2003), and the Eighth Guidance Memo (April 20, 2007). The committee adopted these documents as the foundation for this and future guidance documents. Outdated items were deleted or brought to current status. While much of the guidance provided was contained in previous Guidance Documents, the new guidance is noted by bold type and underlined.

This guidance is intended to address the common issues involved in implementing the animal waste management rules and statutes. Additional guidance will be provided as necessary to continue to clarify the issues contained in this memorandum as well as new issues that may arise. The nature of the rules will require judgment on the part of technical specialists.

Guidance developed by the SB 1217 Interagency Group represent guidelines to address questions from technical specialists and provides uniform interpretations regarding requirements of animal waste management rules. However, for areas where no standards exist, DWQ acknowledges these guidelines as acceptable criteria to base a Certified Animal Waste Management Plan (CAWMP). Any requested deviations from this guidance must be considered by DWQ on a case-by-case basis to insure that the proposal provides equal or better protection. These guidelines may also be incorporated by DWQ as permit conditions for an operation's individual permit or general permit.

If there is a need for any additional information or clarification, please do not hesitate to contact any of the following members of the Senate Bill 1217 Interagency Group:

Dewitt Hardee	NCDA&CS	919/733-7125
Tim Hall	NCDA&CS	910/324-9924
Josh Spencer	NRCS	919/873-2120
Tommy Cutts, P.E.	NRCS	919/873-2127
Robert Evans, Ph.D., P.E.	NCCES	919/515-6700
David Crouse, Ph.D.	NCCES	919/341-9383
Danny Edwards	DSWC	910/433-3394
Vernon Cox	DSWC	919/715-6109
Keith Larick	DWQ	919/715-6697
Melissa Rosebrock	DWQ	336/771-5289

For an electronic version of this document go to:
http://www.enr.state.nc.us/DSWC/pages/guidance_docs.html

For additional information go to: http://www.soil.ncsu.edu/interagency/

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1 WASTE UTILIZATION PLANS

1.1 Parts of a Waste Utilization Plan (except for dry poultry litter – see 5.3)

A waste utilization plan (WUP) is one part of a total waste management plan. The WUP should be reported in a format comparable to the current Natural Resources Conservation Service (NRCS) format prior to certification (see NRCS Practice Standard Code 633 - Waste Utilization). As a minimum the plan will include:

- List of all fields receiving waste by tract number, field number, and acres receiving waste. For irrigated spray fields, show wettable or effective acres as appropriate (see NCCES Publications Irrigated Acreage Determination Procedures for Wastewater Application Equipment for Stationary Sprinkler (AG-553-6) or Hard Hose Traveler (AG-553-7))
- Maps of all fields to be used for waste application
- Amount of manure produced and used annually (see NRCS Practice Standard Code 633 – Waste Application)
- Waste application method
- All crops to be grown by field
- Realistic yield expectations (RYE) for intended crops when available and/or applicable (see NRCS Practice Standard Code 590 – Nutrient Management). For current RYE tables see webpage http://www.soil.ncsu.edu/nmp/ncnmwg/index.html
- Dominant soil series for each waste application field (see county soil survey)
- N application rate by field; based on RYE, or actual yields or NCDA&CS or NCCES recommendation if RYE data is not available
- Annual N balance which equals pounds of N generated by animals minus pounds of N taken up by crop (N balance must be zero or in a deficit)
- Waste application windows (see NRCS Practice Standard Code 590 – Nutrient Management (Criteria item # 13) and Appendix 1.1 A, 1.21A & 1.21B
- Irrigation parameters where irrigation is used (see NRCS Practice Standard Code 633, D_1, D_2, & D_3)
- Calibration information (see NC Publication Field Calibration Procedures for Stationary AG-553-1, Traveler AG-553-2, Center Pivots & Linear AG-553-3, and Spreaders/Tankers - Weight Area Method AG-553-4 and Load Area Method AG-553-5).
- Required specification from NRCS Waste Utilization Standard Code 633
- Emergency action plan (Appendix 1.1B)
- Odor checklist (Appendix 1.1C (cattle), 1.1D (swine), or 1.1E (poultry) depending on animal type)
- Insect checklist (Appendix 1.1F)
- Mortality checklist (Appendix 1.1G)
- Waste sampling within 60 days of land application
- Annual soil sampling: 1) lime requirement, 2) measurement of copper accumulation, 3) measurement of zinc accumulation

In addition to the above items, facilities covered by NPDES (National Pollutant Discharge Elimination System) permits must also include a Phosphorus Loss Assessment and demonstrate compliance with State and Federal Phosphorus Loss criteria by July 1, 2007. **Facilities covered by State Non-Discharge Permits that receive notification from DWQ requiring PLAT assessments must also demonstrate compliance with Phosphorus Loss criteria.**

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1.2 ***WUP Format***

All waste utilization plans must contain a table documenting tract name(s) or number(s), field number(s) and/or pull etc., soil type(s), crop(s), application months, residual legume N utilized per acre based on RYE, total N utilized in field, and useable/wettable acres in field. All crops receiving waste must be in the table including interseeded and cover crops. All crops in the rotation receiving waste must be included in the table by field. All fields receiving waste, including those not needed to utilize N (and P for NPDES **and other subject facilities as identified by DWQ)** generated by the animal operation must be included. Plans for sludge application will use the above format.

Narrative in the WUP must explain or clarify information contained in the above table. The narrative must provide additional information needed by the operator and/or inspector to understand N (and P for NPDES **and other subject facilities as identified by DWQ)** and water balance for the documented cropping system(s) and the animal operation. Exceptions to specific requirements in the WUP must be included.

This guidance pertains to all new or revised WUPs whether on new, expanding, or existing operations.

Nutrient Management Software developed jointly by NCDA&CS, NCCES, NRCS, and DSWC is available for preparing WUPs. Contact your local NCCES office or the DSWC Technical Services Section at (919) 715-6109 for information.

1.3 ***Validity of WUP approved before February 1, 1993***

Approved WUP that met NRCS standards prior to February 1, 1993 meet the operation and maintenance requirements of rule 2T .1300 (formerly 2H .0217) *only* if the design specifications in the original plan approved by NRCS (formerly the Soil Conservation Service (SCS)) are being followed. This includes maintaining the original steady state live animal weight.

If the WUP is not consistent with the original NRCS approved specifications, a new WUP shall be developed to comply with 2T .1300 (formerly 2H .0217) standards. Farms that have expanded without an approved WUP plan must meet the most current specifications for operation and maintenance for the entire volume of waste produced before they can be certified.

1.4 ***Waste Utilization Plan Revisions (Major Modifications)***

A WUP revision or major modification is a required change to an entire plan to meet current applicable standards, current PAN application rates and acceptable WUP formatting. A WUP must be revised if the operation cannot utilize all PAN (Plant Available Nitrogen) generated by the animal production in accordance with the existing WUP, except for the specific conditions noted in the WUP amendment section (see item 1.5).

For an existing WUP, a change in crops and/or cropping pattern that utilizes more than 25% of the PAN generated by the operation is considered a plan revision. To determine if a change meets the 25% criteria:

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1. Multiply the PAN generated by the animals by 25%. For example - a 4896 head feeder to finish operation generates 11,261 lbs PAN/year. Multiply by 25% = 2,815 lbs PAN. Add the amount (2,815 lbs PAN) to the farm's overall PAN deficit to calculate an *adjusted* PAN deficit.
2. If the *adjusted* PAN deficit results in a surplus of PAN, any cropping change will require the entire WUP to be revised. If the *adjusted* PAN balance remains in a deficit, go to the next step.
3. Add the amount of PAN affected by the cropping change to the *adjusted* PAN deficit. For example - if a producer plans to change a 55.2 acre field of Coastal Bermuda on a Goldsboro soil from hay to row crops, the PAN affected is the maximum lbs of PAN utilized by 55.2 acres Coastal Bermuda hay field. For this example, 16,339 lbs PAN for a GoA soil is added to the *adjusted* PAN deficit.
4. If the *re-adjusted* PAN deficit results in a surplus of PAN, the cropping change will require the WUP to be revised. If the adjusted PAN deficit remains in a deficit, the WUP may be amended to reflect the cropping change. See item 1.5 for additional WUP Amendment information.

Change in crops and/or cropping pattern include:

- Change in crop types (e.g. Fescue to Hybrid Bermuda, grass to row systems, etc.)
- Converting from hay to graze systems. It is not considered a cropping change converting from a graze to hay system as long as the operation uses the current PAN rate in the WUP.
- Fields affected by "High" PLAT ratings for NPDES farms **and other subject facilities as identified by DWQ.** For example - the 55.2 acre Coastal Bermuda hay field on GoA soils can use 296 lbs PAN/acre but only 80 lbs P/acre for phosphorus removal. Balancing for phosphorus will result in 73% reduction of animal waste PAN that can be used by the Bermudagrass and equates to a reduction of 11,927 lbs PAN for crop uptake in overall farm PAN balance.
- Removal of fields that were PLAT rated as "Very High" from the WUP for NPDES farms **and other subject facilities as identified by DWQ.**

Any change to an existing WUP, whether an amendment or revision must incorporate the most current approved Animal Waste Application Windows (see Appendix 1.1A), and must be signed and dated by both the owner and a technical specialist for the new WUP to be valid.

A revision of the WUP *only* does not require recertification. Recertification is only required for major changes to the CAWMP (Appendix 2.5A). Major changes include:

1. An increase in the number of animals (or decrease in animal numbers due to lack of available acreage and/or receiving crops, and/or an overall farm PAN balance that results in surplus PAN)
2. Change in type of operation (e.g. converting from a *feeder to finish* operation to *wean to feeder* operation - see item 2.2)
3. Retrofit of an existing animal waste management system (e.g. major repair of dike walls and/or installation of a new component)
4. Installation of a new irrigation system including hardware and hydrants

For systems that have been issued an individual permit or Certificate of Coverage (COC) under a General Permit for Animal Waste, major changes to a facility must first be approved by DWQ. The new CAWMP and the certification shall be submitted with a request that the permit or COC be amended to reflect the changes. The facility may not make the changes until a new or amended permit or COC has been issued.

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If changes are made to an existing WUP, the most recent version of a CAWMP (including the WUP) shall be kept on file at the DWQ Regional Office, local SWCD and on the farm.

1.5 WUP Amendments (Minor Modifications)

A WUP amendment or minor modification is a change and/or addition to a part(s) of the plan, and requires that the change and/or addition adhere to current applicable standards.

- In an existing WUP, a change in crops and/or cropping pattern that utilizes 25% or less of the PAN generated is considered a plan amendment. Adding more acreage to facilitate the change in crops and/or cropping pattern is permissible and considered part of the amendment.

- The addition of winter crops and/or interseeded perennial crops are considered amendments to an existing WUP when the operation can meet the waste system's designed storage capacity (e.g. 180 days) and does not require the additional acreage and/or crops for PAN utilization.

- When a WUP cannot meet PAN utilization requirements due to land lost to irrigation inefficiency (useable versus total acres), then the WUP may be amended to increase available acreage and/or change the crop for N utilization. This is the only exception to the 25% N criteria for plan revision and does not apply to NPDES facilities effective July 1, 2007.

- Inclusions of emergency action plans, and insect, odor and mortality checklists are considered WUP amendments.

- Including additional acreage for land application beyond what is required in the existing WUP is considered a plan amendment.

- Any change to an existing WUP must incorporate the most current approved Animal Waste Application Windows (see Appendix 1.1A), and must be signed and dated by both the owner and a technical specialist for the new WUP to be valid.

- Pen and ink changes may be made under the following conditions:

    1. Changes to the WUP fall within the definition of a plan amendment (see above).
    2. For farms operating under State General Permits only. Pen and ink changes are unacceptable for NPDES facilities effective July 1, 2007.
    3. The changes are initialed and dated by the owner and the technical specialist.
    4. The changes are made in the appropriate places in the plan (see Section 1.2).
    5. The nitrogen balance must be brought forward to reflect the change, if applicable.
    6. The changes must be legible and understandable to the technical specialist, the farm's owner/operator and or DWQ/Division of Soil and Water Conservation permitting and field personnel.
    7. An updated copy must be maintained in the DWQ Regional Office, local SWCD office and at the farm.

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1.6 WUP Conditional Amendment

The producer may secure a conditional one-year amendment (either in the NRCS table format or as a one-page narrative) attached to the certified plan, which outlines the temporary measures. The conditional amendment must be signed by a technical specialist, kept at the farm, filed with the DWQ Regional Office, the local SWCD, and include the following:

- If temporary crop(s) are needed to replace specified crops, include intended crop(s), related soil type(s), RYE(s) based on current standard, useable acres, N utilized, PLAT rating for NPDES **and other subject facilities as identified by DWQ,** month of application, application rate, tract number, field number, and location;
- Revised PAN balance for conditional time period;
- Third party lease or receiver agreements when applicable;
- Confirmation statement that irrigation equipment is available and capable to apply waste to temporary crop(s)
- Beginning and ending dates when conditional amendment is applicable *not to exceed 12 months*.

Note: DWQ retains the right to address any plan violations that initially led to the cropping change and conditional one-year amendment.

For example, a producer needs to make a temporary change in cropping pattern from that specified in the CAWMP. Acceptable reasons may include making improvements to the spray fields (land leveling, upgrading drainage, etc.), unexpected crop failure and inability to replant within specified planting window due to extreme weather events and/or soil conditions, or establishing a crop like Hybrid Bermuda without small grain overseeding during the first year as specified in the plan. Since all receiving crops shall be specified in the plan, the plan shall be amended for this temporary situation.

1.7 WUP Changes Required by DWQ

DWQ will not routinely require changes to a WUP after it is approved by a technical specialist. Plans shall be sent to the local SWCD to evaluate the soundness of the plans. The local SWCD is responsible for notifying DWQ of deficient plans. If there is a discharge from structures or land application sites, standards and specifications are not being followed, or a plan is found to be deficient, DWQ may require a change to prevent the problem from reoccurring. Current NRCS standards and specifications shall be met when the plans are changed as part of an enforcement action.

1.8 Addition of Fields to WUP

When a field is added to the WUP resulting in a land application system change or addition, the field shall meet current State and NRCS standards, setbacks and buffers. All new irrigation systems or additions to existing systems installed on fields not previously included in the WUP must be certified and must meet current State and NRCS standards, buffers and setbacks. NPDES facilities must also certify compliance with EPA standards, buffer and setbacks effective July 1, 2007.

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1.9 ***Multiple WUPs***

Even if several dated and signed WUP exist for a facility, the producer shall implement the newest revised WUP signed by a technical specialist and on file with the DWQ Regional Office, the local SWCD and at the farm.

1.10 ***Land Approved for the Application of Manure***

A facility shall not apply animal waste on land not approved as part of their CAWMP. Although a facility may wish to use additional land, manure shall not be applied on owned or unowned land unless that land has been evaluated and approved as part of the CAWMP.

If a facility has more land than is needed for manure application, the owner is strongly encouraged to have all land evaluated and approved as part of the CAWMP. The additional land may be needed due to system failure or extremely wet weather

1.11 ***Wetland Waste Application***

Wetlands are considered as waters of the State, therefore, waste application in wetlands is *not* permitted.

1.12 ***Grassed Waterway Waste Application***

Current NRCS waste utilization standards allow application of animal waste on grassed waterways at agronomic rates and at application rates that do not cause runoff or drift from the site.

1.13 ***Verification of Erosion Rates***

The technical specialist who signs the WUP portion of the certification form shall determine if erosion rates are acceptable (see NRCS Practice Standard Code 633) on all fields where waste is applied. If erosion rates exceed the acceptable level, then the WUP cannot be certified until the farmer has installed necessary erosion control measures before the waste can be applied.

1.14 ***Subsurface Drainage***

Animal waste may be applied to fields with subsurface drainage, provided the quantity of wastewater applied at a given time does not exceed soil water holding capacity in the effective root zone. Owners should be informed of their liability for water quality violations that result from discharge from subsurface drains.

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1.15 ***Crops Grown Other Than Those Specified in the Plan***

A permit and/or plan violation occurs if a producer does not have correct crops established (i.e. Hybrid Bermuda) as stipulated in his WUP. The producer shall either establish the correct crops or revise his WUP. In the case of Hybrid Bermuda, if the planting date is passed, the producer may plant other crops until next year's planting date. The conditional amendment shall be included in the CAWMP on file at the DWQ Regional Office, the local SWCD and at the farm. In any case, the producer shall follow a plan that provides for an N balance between waste application and crop utilization.

1.16 ***Nitrogen loading rates that exceed published RYEs***

A certified WUP may contain loading rates higher than RYE; however, the producer shall justify higher N application rates through yield records.

DOCUMENTING ACTUAL YIELDS FOR FORAGE CROPS:

Accurate yields for use in a WUP need to be based on data from the wetted acres of an application site. Data shall be collected for each harvest and added for an annual total. Count the number of bales and obtain weights on 10% of all bales with a minimum of 5 bale weights for each harvest date. These weighed bales are to be sampled individually by drilling a 30-inch hay probe in three locations on the side (not end) of each bale. Each composite forage sample per bale will be dried and used to calculate dry matter production. Dry matter of forages can be determined using a household microwave (North Carolina Agricultural Research Service (NCARS) Bulletin 305, Appendix C, pp.142-143) or by submitting the samples to the NCDA&CS forage testing lab. Once percent dry matter is obtained for each bale, multiply the wet weight by the percent dry matter. This is the dry matter yield for the single harvest. These values will be added to calculate the annual dry matter production, which can be compared to the realistic yield exception database value.

FORAGE MOISTURE TESTING USING A MICROWAVE:

Procedure: Place 100 grams of forage on a plate. Put a paper towel between the forage sample and a plate to minimize "sweat" from forming on the plate. Put a 10-16 ounce covered glass of water in the corner of the oven to capture unabsorbed microwaves as the plant tissue dries. Set oven to HIGH for 5 minutes. After 5 minutes weigh sample & plate and record weight of sample. Change the water and insert sample into oven for 2 more minutes. Weigh and record sample weight. Repeat steps 6 & 7 until sample weight doesn't change more than one gram (this means sample is dry).

% Moisture = 100 gram – dry weight gram.
% Dry matter = the last dry weight of sample (assuming 100 grams starting wet).

With experience you can adjust the time periods and decide whether or not it is necessary to use the glass of water. Usually, the above method will give moisture content that is about 2% more than true sample moisture content. For hay, this procedure takes 10-20 minutes depending upon initial moisture content of sample. Silage samples take 15-25 minutes because of coarser particle sizes and grain content, which dry slower. Practice this procedure several times before the day you really need it because it takes some practice to get the procedure "fine tuned".

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1.17 Use of Soil Sample Report's N Recommendations

For operations with populations that meet the 2T .1300 (formerly 2H. 0217) threshold requirements, it is not permissible to develop a WUP based on the N recommendation for the receiving crop in the soil analysis report. This guidance is not applicable to **deemed permitted** dry poultry litter (Appendix 5.3).

1.18 Documentation of Commercial Fertilizer and Other Nutrient Sources on Land Application Sites

DWQ requires that all N sources including commercial fertilizers, sludges, and dry litter shall be documented in the records for all fields receiving animal waste. **In addition, all NPDES facilities shall document P applications.**

1.19 Soil Testing For Copper and Zinc

Regulations require annual soil analysis for copper (Cu) and zinc (Zn) on fields that receive manure, and require that alternative crop sites be used when these metal levels approach excess levels. When soil Cu or Zn levels reach values in the following table the producer shall contact a qualified specialist to discuss options for future manure applications.

Zinc and Copper Toxicity Levels in Soils

Metal	Soil Test Index	Recommended Action
Zn	**300**	Limit application on peanuts. Maintain soil pH ≥ 6.0.
	500	Cease application on peanut land. Maintain soil pH ≥ 6.0.
	2000	Caution: seek alternative site (all crops). Maintain soil pH ≥ 6.0.
	3000	Cease application (all crops). Maintain soil pH ≥ 6.0.
Cu	**2000**	Caution: seek alternative site (all crops). Maintain soil pH ≥ 6.0.
	3000	Cease application (all crops). Maintain soil pH ≥ 6.0.

1.20 Role of Plant Tissue Analysis in Justifying Additional Waste Applications and/or Extending Application Windows

Plant tissue analysis can be used to justify additional waste applications, when crop nutrient deficiencies are suspected. When utilized correctly, tissue testing provides useful information about crop nutrient status and is an accepted tool for proper waste management. To justify additional N and/or extend the application period, the producer shall work with a NCDA&CS regional agronomist, or an agronomist certified by the N.C. Agricultural Consultants Association (NCACA) or Certified Crop Advisor Program (CCA). Other qualified professionals may be identified later. The agronomist will collect a plant tissue sample for nutrient analysis in accordance with NCDA&CS guidelines (Appendix 1.20), evaluate the crop maturity, and determine the N requirement relative to growth stage. Following interpretation of the plant tissue analysis, the agronomist can make recommendations, in accordance with NCDA&CS guidelines (Appendix 1.20), for further applications of N and/or to extend the application period. For the major annual receiving crops - corn, soybeans and small grains - suggested guidelines for

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determining supplemental (above-rate) PAN are given in Appendix 1.20. These guidelines supplant the suggested PAN amounts previously given Appendix 1.20 for the aforementioned crops. The suggested PAN supplementation percentages given in Appendix 1.20 may be used for perennial forage grasses and other crops.

The recommendation shall be documented as a Conditional Amendment, signed by a designated technical specialist, and kept on file for three years (five years for NPDES facilities) at the farm, the local SWCD office, and the DWQ regional office.

During the annual operation review or inspection, the evaluation will establish if the grower is improperly applying high N rates early in the season to establish additional need later. Improper waste management is a violation of the CAWMP and subject to an appropriate enforcement action.

1.21 ***Overseeding Hybrid Bermuda Harvested for Hay or Grazed***

The maximum allowable N rate for any small grain overseeded in Hybrid Bermuda is 50 lbs N/acre above the normal application rate for Hybrid Bermuda. No reduction in the 50 lbs N/acre is required if the small grain is grazed.

To prevent damage to the Hybrid Bermuda stand, the CAWMP shall specify that the small grain must be harvested before heading.

If other alternatives established by NCSU (Appendix 1.21A) are used, criteria given in this publication, including waste application windows and seeding and harvest dates, shall be strictly followed.

1.22 ***Burning Baled Hay***

15NCAC 2D.1903 *PERMISSIBLE OPEN BURNING WITHOUT A PERMIT*, paragraph (b)(5) allows for "fires purposely set to agricultural land for disease and pest control and fires set for other agricultural or apicultural practices acceptable to the Department of Agriculture." The practice of burning baled hay does not meet the intent or definition of this exemption since it does not control disease or destroy pests, and therefore is not permissible as an acceptable disposal method.

1.23 ***Use of Farm Records to Determine PAN***

Where adequate records exist, farm records may be used to determine the amount of PAN produced by the facility using the procedure provided in appendix 1.23. Modification of a waste management plan resulting in a PAN reduction would decrease required acreage for waste application. In cases where liquid waste levels and/or over-application frequently occurs due to shortage of application acres (3 out of 5 years or 2 consecutive years), DWQ may require returning to the standard WUP planning process and securing the needed additional acreage.

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1.24 ***N Coefficients***

A value for nitrogen uptake by crop has been selected for each soil type in North Carolina. This value must not be exceeded in situations where new fields are being added to existing waste utilization plans or included in new plans unless justified by a NCDA&CS Regional Agronomist (other qualified professionals identified in item 1.20) based on plant tissue analysis. Where existing plans are being revised or amended (i.e. no new fields being added), using the assigned program value is encouraged, but not mandated.

N coefficients by crop and soil types are included in the new nutrient management software, and are available at the web address **http://www.soil.ncsu.edu/nmp/** or your local NCCES office.

1.25 ***N Management for Nonharvested Winter Annual Cover***

The maximum amount of PAN which may be applied to small grain seeded as a cover crop not for harvest is 30 lbs per acre. N application to the next crop must be reduced by the amount applied to the small grain. This option must be stated in the waste utilization plan.

1.26 ***Sludge Removal Planning***

An annual sludge evaluation is required of all **lagoons that have been in operation for more than five years on all** permitted operations in accordance with the Division of Water Quality's general permit conditions. **The NRCS Waste Treatment Lagoon Standard Code 359 was revised July 2008 with regard to sludge management. According to the revised 359 standard, if sludge accumulation in the lagoon treatment volume exceeds 50% of the planned treatment volume, the sludge should either be removed or the lagoon managed in accordance with an approved sludge management/operation plan as approved by DWQ. The sludge accumulation must be documented using methods described in NCCES sludge survey publication AG-639W (see Appendix 1.26A for sludge survey form and worksheets), or other worksheets as approved by DWQ.**

Considerable planning is needed for sludge removal. Periodic sludge removal does not warrant a full revision to the operation's waste utilization plan. A WUP conditional amendment, approved by a technical specialist, must be developed that outlines the sludge removal and land application procedures to be used based on waste concentrations and volumes. The amendment including calculations, waste application rates, sludge survey measurements, map and other related documents are considered part of the CAWMP; must contain the items noted in section 1.6; and must be based on the following items and/or considerations:

- A good representative sludge analysis and liquid analysis taken prior to sludge removal are required to accurately determine the amount of plant available nitrogen (PAN), phosphorus, copper and zinc contained in the waste. Proper sludge sampling techniques are found in the NCCES publication #AG 604.
- A soil sample report for fields proposed to receive the sludge must be obtained (1) within the twenty-four months prior to sludge application and (2) following the last application of waste prior to the proposed sludge application. This report will serve as the basis for estimating persistent metal (copper and zinc) effects on soil indices.

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- An evaluation of the lagoon is needed to determine the volume of sludge to be removed. Approved lagoon evaluation and sludge measuring techniques are those described in the NCCES publication #AG 604 or any other method approved by the DWQ. The method of removal will have a significant impact on the volume of liquid to be removed. For example, agitation and pumping will result in waste slurry meaning removal of sludge and liquid, versus dredging which results in sludge and partial liquid removal. The estimation of volume and methodology of sampling should appropriately reflect the physical nature (solid:liquid constitution) of material that will be applied, which may vary greatly depending on the method of removal.
- It is highly recommended that sludge be applied only to fields that are not used for continual animal waste application to prevent phosphorus and persistent metal build-up that may render sites unsuitable for long-term waste application. If the sludge is to be applied on sprayfields already listed in the CAWMP, the operation's overall PAN balance must include the additional PAN from the sludge and still remain in a PAN deficit for the animal operation.
- It is highly recommended that potential increases in copper and zinc soil levels be estimated during plan development. The DSWC Copper and Zinc Projection Worksheet **(**Appendix 1.26*B*) may be used to provide a conservative (maximum potential) estimate for increase in soil index values. [*Note: The equilibrated post-application soil index may be less than the projected maximum value. Practical methodology for more precise estimation is not available*.] Due to the inherit variability of waste and soil sampling, it is recommended that conservative soil target levels be set for copper (e.g. Cu-I < 700-1000) and zinc (e.g. Zn-I < 300 for land where peanuts may be grown; for other cropland Zn-I < 700-1000). See section 1.19 for maximum copper and zinc soil index limits.
- New fields receiving animal waste or sludge for the first time must meet current setbacks, buffers and other requirements as described in sections 1.8 and 8.1.
- For NPDES, **and other subject facilities as identified by DWQ**, a Phosphorus Loss Assessment must be completed and all applicable standards must be met.
- If sludge is applied on conventionally tilled bare soil, the waste shall be incorporated into the soil within two days after application on the land. **As of October 1, 2009, for facilities covered under the State Non-Discharge Permit, waste incorporation must also occur before the next rainfall event.** This permit requirement does not apply to no-till fields, pastures or fields where crops are actively growing.
- Sludge application must be balanced with a current waste analysis (waste sample taken and analyzed within 60 days of application) on the SLUR-1 and SLUR-2 forms, or on other forms approved by DWQ.
- The permittee is responsible for documenting all sludge applications made to both the owned and leased fields listed in the CAWMP/WUP sludge amendment.
- For sludge transfers, the permittee must document the name and address of the recipient, and volume of sludge removed from the farm. The permittee must provide the third party receiver with a current sludge and liquid analyses and information for proper land application management as required by the farm's permit.
- The third party receiver is responsible for obtaining coverage under the appropriate DWQ permit, and for the documentation and proper land application of the sludge on the approved site(s).

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1.27 ***RYE Source***

The official source for RYEs information is the Interagency Nutrient Management Committee tables found at the website listed in item 1.1. Also, the NRCS Nutrient Management (590) Standard provides a method to establish RYEs using farm records.

1.28 ***Combination Haying and Grazing***

For waste management planning, the rate of N removal for grazing is 25% less than haying. In situations where the forage is removed through both haying and grazing, the NRCS 590 Standard allows for applying the appropriated RYE application rate for each harvest method.

For example: The RYE is 6 tons and one hay cutting would harvest 1.5 tons leaving 4.5 tons for grazing.

The calculation would be: 1.5 tons X 50 lbs N/ton + 4.5 X 50 (.75) N/ton = 244 lbs N per acres.

1.29 ***Recommended WUP Amendment and Recordkeeping Adjustments for Combination Application Systems (e.g. Hose Drag & Traveler)***

When combining an irrigation system (e.g. traveler, solid set, linear or pivot system) with a broadcast system (e.g. hose drag or honeywagon) on the same sprayfield, recordkeeping adjustments must be made to properly document and balance the applied nutrients. Generally, broadcast systems are more efficient in coverage and are capable of applying waste to areas not accessible by irrigation systems.

The preferred method of documentation is:
To have the WUP amended so that a field is divided into subsets (effectively irrigated/wettable acres for irrigation and broadcast acres).
To set up the application records (IRR2, SLUR-2, etc.) by subset to accommodate the application method and related acreage.

By dividing a field into subsets, the applicator has the flexibility to apply by either method to part of or the entire field, and still balance the applied nutrients on a pounds per acre basis for each subset. When using a hose drag on an entire field, the volume of waste applied (documented through flow meter) must be pro-rated per subset to adequately balance the nutrients. At no point can waste be applied in required buffers and setbacks (see item 8.1 and section 9).

1.30 ***Determining Appropriate Waste Analysis for Waste Transfers***

Structures operating in series - waste transferred from primary lagoon to secondary pond and irrigating from secondary: use waste analysis from secondary for land application records.

Structures operating in series - waste transferred from several structures to one final structure that serves as source for irrigation: use waste analysis from final structure for land application records.

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Structures operating in series - waste transferred from primary lagoon 1 to primary lagoon 2 (both structures receive solids) and irrigates from lagoon 2: use waste analysis from lagoon 2 for land application records.

Structures operating in series - waste not transferred from lagoon 1 to secondary pond (or final stage) due to shortage of water: use waste analysis from structure that serves as source for application events.

Structures not operating in series - waste transferred from structure 1 to structure 2 and irrigated from structure 2: after waste transfer, take waste sample from structure 2 prior to land application and use new waste analysis for land application records. If sample is not taken prior to land application, must use the waste analysis with the highest PAN content of either structure 1 or 2.

1.31 ***RYE Values for Superior Lines of Seeded Bermudagrass***

See Appendix 1.31

1.32 ***Animal Waste Application on Turf Sods***

See Appendix 1.32

1.33 ***N Application for Nonharvested Wildlife Plantings***

The maximum amount of P.A.N., which may be applied to wildlife plantings that are not harvested using traditional methods, is 60 lbs per acre per year.

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2 REGISTRATION AND PLAN CERTIFICATION

2.1 Future Changes to Standards

It is encouraged but not required to update a certified plan to reflect standard changes. If a discharge occurs, or there is documentation that surface waters or groundwaters has been impacted, then the facility will be required to update the plan according to the most current technical specifications.

2.2 Farm Status Changes – Change of Ownership and Reactivation Processes

Change of Ownership
For each change in farm ownership, the new owner shall submit a completed Change of Ownership form (Appendix 2.2A) within 60 days of ownership transfer. The Change of Ownership form must be understood, implemented, and placed within the farm records. If the CAWMP is changed, a technical specialist shall certify the new plan to meet current standards and specifications for operation and maintenance, and a new certification shall be submitted to DWQ. Making no changes or only plan amendments (minor modifications) to the waste utilization plan does not require a new certification.

Reactivation Process
Any facilities wishing to repopulate above threshold shall implement a certified animal waste management plan before facility can restock above threshold numbers. The certified animal waste management plan shall comply with all Statutes and Rules in effect at the time of certification. The facility would also be required to apply for and receive coverage under a general or individual permit before restocking.

For facilities that have submitted a deactivation form and have been out of operation for less than four years whether below threshold or no animals on-site shall submit the following to DWQ:

- Permit Application (if not previously permitted)
- Current Animal Waste Management Plan Certification form (Appendix 2.5A)
- Proof of a significant number of animals on site within the past 4 years for a period of 45 days or more.
    - Vet Records
    - Kill Dates
    - Market Sales for this facility
- Operator-In-Charge (OIC) form (Appendix 11.1A)

For facilities that have been out of operation for more than four years whether below threshold or no animals on-site shall submit the following:

- Permit Application (if not previously permitted)
- Current Animal Waste Management Plan Certification form (Appendix 2.5A)
- OIC Form
- The waste management system must be brought up to NRCS Standards

The waste structures will be considered new and will have to meet all current NRCS Standards (this includes liner, sludge storage, and extra 25 year, 24 hour storm event storage.)

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If owner exceeds threshold numbers without notifying and receiving all required approvals from DWQ, the owner is subject to enforcement action.

Change of Operation Type
Prior to making a change in operation type, the following items must be submitted to DWQ for approval:

- Permit modification request
- Amended or revised WUP reflecting change in operation type
- Updated Animal Waste Management Plan Certification form (Appendix 2.5A)

Note: Additional components of the CAWMP may be requested by DWQ.

The facility may change its type of operation once it receives its new permit.

2.3 Conditional Approvals for Certification of New or Expanding Facilities

Generally conditional approvals will not be accepted as part of an operation's certification for a general or individual permit application. For extenuating circumstances, contact DWQ for further guidance.

2.4 Required Documentation for Certifications and Plans

The owner is responsible for obtaining a CAWMP that has been approved and certified by technical specialists. The owner shall send the original signed certification form to DWQ. The owner shall retain a copy. The approved plan shall remain at the farm site and on file at the Regional DWQ Office and the local SWCD office.

For the documentation sent to the local SWCD office, the district has 30 days to review the plan for concurrence. If the SWCD concurs with the plan, the plan is kept on file at the SWCD office. If the SWCD does not concur, the SWCD will notify in writing the owner, DWQ and DSWC. DWQ will work with the agricultural agencies to develop an approved plan or require the owner to apply for and receive coverage under a permit.

The SWCD is required to notify the owner, the certifying technical specialist, DWQ, and the DSWC if the SWCD does not concur with the CAWMP. The owner or DWQ may request the SWCD to reconsider. If the SWCD does not concur, the owner may request the Soil and Water Conservation Commission (SWCC) to mediate a dispute over concurrence.

The components for the CAWMP are listed in Appendix 2.4.

2.5 Certification Form Requirements

All certifications shall be on the DWQ Animal Waste Management Plan Certification form (Appendix 2.5A).

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Only a technical specialist who has been designated under the SWCC rules can certify items on the form. In order to sign for an item, the technical specialist must have the corresponding category of designation (Appendix 2.5B).

Proper calibration of irrigation equipment shall be documented. The field calibration must show accurate rates of application. For irrigation equipment, application rates must be measured at several locations in the application area. For calibration information see NC Publication Field Calibration Procedures for Stationary AG-553-1, Traveler AG-553-2, and Center Pivots & Linear AG-553-3.

New "non-irrigation" waste application equipment does not require certification by an irrigation (I) technical specialist designation under II D, of the CAWMP Certification form. A WUP may certify manure spreader and honey wagon equipment.

With the requirements of regulations, it is very important to track the dates each part of the certification process was completed. The certification form was modified to document the date the activity was completed. The current date should continue to be the date the form is signed.

2.6 ***Abandonment***

If a facility is abandoned or unused for four years or more, regardless of its certification or permit status, the farm will be considered a "new" facility for permitting purposes and the operation would have to meet all permitting requirements before it could be restocked.

Questions regarding active registration by producers who depopulated usually involve distinction between "existing" and "new" systems. 15A NCAC 2T .1302(3) (formerly 2H. 0203(21)) defines a "new" animal waste management system as follows:

> …animal waste management systems which are constructed and operated at a site where no feedlot existed previously or *where a system serving a feedlot has been abandoned or unused for a period of four years or more and is then put back into service.* (For purposes of this referenced rule, "abandoned" and "unused" are interchangeable, meaning ceasing to exist.)

Therefore, an operation will lose its "existing" status and be considered a "new" operation if unused for four or more years. In order to determine the proper categorization as an "existing" or "new" farm, DWQ uses the following operating guideline of 10% of the registered number (capacity) in making this determination, and the rule is being applied as follows:

> 'Unused' means less than 10% of the registered number of animals or less than 10% of the number of animals at system capacity have been on site. Furthermore, consistent with the EPA definition of an "animal feeding operation", the requisite number of animals must be shown by the operator to have been on site for a total 45 days or more within any 12-month period, or the feedlot will be considered unused for that year.

Any number less than10% is a *de minimis* attempted use which would not be generally covered by the spirit or intent of the rule; however, a producer is allowed to verify to DWQ that his system had been used in order to retain the operation's "existing" status.

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For swine farms located within the 100 year floodplain, those swine farms which applied for the first or second phase of the 100 year floodplain swine farm buyout conducted by the DENR Division of Soil and Water Conservation shall not begin to be considered to be "unused" until the farm has been informed that its applications for buyout were denied, provided the farm maintained the required permits.

If an operator needs to verify the farm's "existing" status or correct his/her registration number in the state database, he or she must submit a written request to DWQ for the correction including justification for the change. The producer must also submit documentation of the existing herd numbers and dates the animals were housed at the facility as found through market or production records and/or verification by a government agency official familiar with the operation.

Questions should be directed to the DWQ Animal Feeding Operations Unit at (919) 733-3221, with correction requests submitted to the Division of Water Quality - Animal Feeding Operations Unit, 1636 Mail Service Center, Raleigh, NC 27699-1636.

2.7 ***Separate Ownership with Common Waste Facilities***

Operations shall not share common spray fields and/or waste management systems (other than land application equipment) unless they are certified and permitted as one operation under the same ownership.

2.8 ***Irrigation Systems for New or Expanding Operations***

Effective September 1, 1996 NRCS standards require irrigation design plans as part of the waste utilization standard for new and expanding systems. Detailed irrigation plans such as size of nozzles, operating pressures, etc, shall be part of the certification process. While this same level of design is not required for existing systems, the waste utilization standard does require the waste to be applied uniformly at approved rates and volumes to prevent runoff. It is the responsibility of the owner to provide a system to meet these conditions and to verify the availability of the equipment, land and vegetation.

2.9 ***Irrigation Certification of Existing Systems***

Even though a technical specialist did not design the irrigation system, a technical specialist shall certify that the existing equipment is capable of applying waste to meet requirements of the CAWMP certification form (Appendix 2.5A - Section II D.), and the equipment is available to use on site (Appendix 2.5A - Section III D.).

2.10 ***Application and Handling Equipment Certification***

A producer must own, have access to, lease or otherwise have a written agreement with a custom applicator for waste application equipment to obtain a CAWMP.

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2.11 Modifications to Facilities to House the Certified Number of Swine

Contact DWQ for approval prior to construction and/or expansion of swine houses.

2.12 Retrofit to Meet Original Registration Number of Swine

A producer may retrofit his or her current waste management system (i.e./enlarge the current structure, construct a second stage lagoon, etc.) and have the operation recertified to a higher number that is NOT to exceed the original registration number. The operation must first be recertified by a technical specialist, and the recertification and a request for a permit or COC amendment shall be submitted to and approved by the DWQ before stocking animals at the higher recertification number.

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3 LAGOONS AND WASTE STORAGE STRUCTURES

3.1 Unused Lagoon/Waste Structure Management and Closure

Lagoons/waste structures that are no longer in use shall be either managed to prevent discharge to surface and groundwaters, or decommissioned through a closure plan. If a discharge does occur from an abandoned animal waste management structure, the farm owner is subject to enforcement action by DWQ. In addition, if a water quality or groundwater problem is identified, DWQ will require proper closure of the structure in addition to enforcement action and possible civil penalty.

For abandoned lagoons and waste structures, proper closure at the earliest possible date is strongly encouraged. An unclosed lagoon is a potential safety and environmental danger as well as a liability to the farmer. The closure plan outlining the closure process shall follow NRCS Practice Standard Code 360. Proper closure includes verification by a technical specialist that the work was done according to standards and specifications, and the completed Animal Waste Storage Pond and Lagoon Closure Report Form (Appendix 3.1) is submitted to DWQ within 15 days following completion of the closure. The regional DWQ staff must be notified at least 24 hours prior to the start of closure. Once the closure is completed and acknowledged by DWQ, the structure is no longer considered part of the waste management system, is deleted off of the state database, and may be used for other purposes such as for irrigation or as a fishpond.

Either a closure plan or the management of an unused lagoon or waste structure must be included in the CAWMP for facilities operating above threshold as specified in 2T .1300 (formerly 2H .0217).

Inactive lagoons or waste structures for non-permitted facilities (operations with no animals or operating below threshold) shall be properly managed to prevent discharge to surface and groundwaters; however, the waste does not have to be land applied by a certified animal waste applicator.

3.2 Renovation of Existing Animal Waste Management Systems With No Expansion

If a facility is not being expanded but modifications to an existing waste system is needed to increase its storage or treatment volume, modifications cannot be made without meeting current standards or without updating the existing the Animal Waste Management Plan Certification form. Only minor repairs can be made to the structure. Examples would be work to repair minor erosion or the addition of more soil to the dike to provide greater stability provided the top of the dike is not raised above the design elevation.

If a new lagoon or waste storage structure is added to an existing treatment system (no increase in SSLW since February 1, 1993) to provide additional treatment or storage and is tied into an existing structure (including connection by pipe or lift station), the existing structure does not need to meet current design standards. While it is encouraged that all-existing structures are upgraded to meet current standards any time there is construction on a site, it is not automatically required. The technical specialist shall make a determination on the need for structural upgrades during the evaluation of the overall system. If a determination is made by the technical specialist that the existing structure is not endangered by the connection to the new structure(s) and that it is structurally sound, no upgrades to meet current standards are required. In determining the stability of the structure, the technical specialist should evaluate and

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document signs of previous discharges, pumping frequency (infrequent pumping suggest leaking), slope stability, and seepage or wet areas along the backside of the dikes.

3.3 ***Lagoons in Wetlands or Floodplains***

Lagoons shall not be constructed in wetlands or a 100-year floodplain.

3.4 ***Design Standards***

For a lagoon or waste storage structure constructed after February 1, 1993, the design requirements are contained in the NCAC 2T .1300 (formerly 2H. 0217) rules, state Statutes, and NRCS and SWCC technical standards, in effect on the date of the design completion as documented through NRCS design approval, a professional engineer (PE) seal, or a CAWMP certification form. (Appendix 2.5A.) Only a PE or NRCS employee with job approval authority may certify waste structures constructed after February 1, 1993. New construction and/or modification require certification. Certified designs for lagoons and waste storage structures in which construction has not commenced within one year of a design standard change shall be constructed according to the current design standards regardless of the original design date and require recertification.

The SWCC has rescinded its animal waste management standards adopted May 2, 1996 effective January 1, 2001. Certifications made after January 1, 2001 of farms existing prior to May 2, 1996 must meet current NRCS standards.

3.5 ***NRCS Policy on Modifications***

If NRCS provided technical assistance for the design and/or installation of the original waste structure, technical assistance for the modification may be available from NRCS, as time and resources permit. If NRCS did not provide technical assistance for the original structure, then technical assistance from NRCS will not be available for the modification, due to the extensive workload required to adequately assess the original structure's design and construction.

3.6 ***Overflow Pipes Used for Emergency Spillways***

Overflow pipe(s) in lagoons are acceptable as a lagoon emergency spillway, provided they are properly designed for adequate capacity for the design storm and have a stable inlet and outlet.

3.7 ***Liquid Levels for Staged Waste Structures***

In a staged system where the primary waste structure is gravity fed through a transfer pipe into a secondary structure, the top of the transfer pipe shall be set just below the primary structure's structural freeboard elevation if the primary lagoon’s 25-year, 24-hour storm requirement is calculated into the second structure’s temporary storage. Pipe size shall be designed to carry the 25-year storm event without encroaching on the structural freeboard.

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3.8 Pumping Markers for Staged Waste Structures

Pumping markers are only required in those structures that do not gravity feed through a free flowing (no valve) transfer pipe into a subsequent structure, and in those structures which serve as the primary source for land application. For example, if waste empties from the house into a solids trap, is pumped to lagoon 2, gravity fed to structure 3, and then pumped to a solid set system for land application, both the solids trap and structure 3 are required to have markers.

3.9 Requirements for Elevation Pumping Markers

NRCS standards require start (maximum) and stop (minimum) pumping markers in lagoons. Since producers are required to record freeboard and available storage capacity under an animal waste general permit, it is required that they install elevation markers that will clearly identify minimum and maximum liquid levels, and highly recommended that the gauge enables accurate determination of the distance between the top of dike elevation (often the lowest point) on the embankment and the liquid level.

Waste storage structures are designed to be emptied completely and would not require a minimum elevation marker. Anaerobic lagoons are designed with a permanent treatment volume, and would require a minimum elevation marker so the permanent treatment volume is maintained.

3.10 Freeboard for Solids Traps

Older swine operations had lagoons that were dug pits (no dike walls) and were later converted into solids traps with waste pumped to a newer structure(s) to satisfy retrofit requirements of the waste handling system. These structures are allowed to operate with less than the one foot structural freeboard and 25-year, 24-hour storm event storage requirement if (1) a back-up pump with power source is available in the event of equipment failure to lift waste to a secondary structure, (2) a honey wagon/tanker is available with the capacity to remove waste and lower the structure's waste level back to a compliant level or (3) a secondary containment structure is available to store the waste. For exemption from the one-foot structural freeboard requirement, consideration must be also given to the location of the seasonal high water table, proximity of the solids trap to drainage ways, flushing volumes and frequencies, and other case-by-case circumstances that may affect the system management. Under no circumstances will a solids trap be allowed to operate with a structural freeboard equal to or less than a 25-year, 24-hour storm event. Solids traps are also required to have a minimal dike wall or comparable best management practice (BMP) in place to prevent outside surface water from entering the structure.

3.11 Trees on Embankments

Trees, shrubs, and other woody vegetation shall not be allowed to grow on the lagoon/waste storage pond embankments. All trees shall be removed in accordance with good engineering practices. Lagoon/waste storage pond areas shall be accessible, and vegetation shall be kept mowed. Removal of trees does not automatically constitute a retrofit requiring a complete structural upgrade to current standards.

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3.12 ***Proper Use of Lagoon (359) Standard***

Current NRCS standards allow for design treatment volumes (i.e. Table 2. Livestock Anaerobic Lagoon Criteria) that are lower than in previous standards for farrow/wean, farrow/feeder, and boar/stud operations. However if this is done, the current standards for sludge storage, excess water, etc. shall also be used to properly utilize the standard. Attempting to use these new volumes on existing operations that have been designed and approved under an earlier standard in order to increase the number of animals will be considered an expansion and all current criteria for expansion shall be met.

3.13 ***Use of Heavy Rainfall Volume In Post '96 Designed Lagoons***

Lagoons constructed to the NRCS standard revised in 1996, included an additional storage for heavy rainfall. This storage is located immediately above the temporary storage and is designed to store above average rainfall events. Encroachment into this storage volume without above average rainfall would not be consistent with the operating procedures of the CAWMP.

3.14 ***Lagoon Level Management Option***

In preparation for above average rainfall during fall and winter, and to improve crop establishment during fall droughts, some flexibility may be offered in managing lagoon levels according to NRCS standards. (When released can be found at the NRCS web site at www.nc.nrcs.usda.gov). Contact the local SWCD office for current guidance. All other criteria in the CAWMP must be followed.

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4 NONDISCHARGE RULES AND GENERAL STATUTES

4.1 ***Zero Discharge During Design Storm***

The animal waste collection, treatment storage, and application systems shall be designed, constructed, and operated as a non-discharge system to prevent the discharge of pollutants to streams and ditches, as a result of a storm event less severe than a 25-year, 24-hour storm.

The intended flexibility in the Environmental Management Commission's (EMC) current rules is contained in the definition of "animal waste management system" in NCGS 143-215.10B (3). The definition of animal waste management system is specific to achieving no discharge of pollutants for any storm event less severe than the 25-year, 24-hour storm. Therefore, DWQ and the agricultural management agencies agree that, for animal operations existing on June 30, 1995, the rules allow the use of management practices that do not require the containment of the entire runoff volume from the 25-year, 24-hour storm event. All new structures, such as waste storage ponds and treatment lagoons, when used as a component of the primary waste management system, shall be designed for the 25-year storm and the chronic rainfall event according to standards and specifications of the NRCS when these new structures are chosen to be part of the waste system.

All liquids from paved areas and milking areas shall be collected in a waste storage facility or in some other way treated to insure *de minimus* discharge of pollutants in a storm event less severe than the 25-year, 24-hour storm event. For any facility wishing to install a system utilizing other than a waste storage facility, DWQ must agree that the alternative system will have no more than a *de minimus* impact. DWQ may request that a committee made up of a representative from NRCS, SWCC, and NCCES assist in this determination.

Agricultural management agencies will utilize and accept waste management practices on existing animal operations that effectively control pollutants to the greatest degree possible. Based on this concurrence, technical specialists should continue to approve and certify plans that meet the intent of controlling the discharge of pollutants using their best professional judgment.

4.2 ***Expansions Under 2T .1300 (formerly 2H .0217)***

An expansion is an increase in the SSLW of animals on a farm after December 31, 1993 above the amount for which the animal waste management system was previously designed and constructed.

If an operation expands and has a certified plan, only the new structures required for the expansion are required to meet current design and construction standards and specifications. However, the entire volume of waste generated shall meet the current NRCS standard for waste utilization. That is, the most current N loading rates based on crop yield will be used for the entire waste volume to be utilized. However, if there are wastewater discharges from a facility or documented surface water or groundwater problems, the facility may be required to update the plan according to current technical specifications

If an existing lagoon or storage structure does not meet current NRCS design and construction specifications and is connected in anyway with a new lagoon or storage structure (including connecting by pipe or lift station), then the old structure shall be retrofitted to meet the current standards because it

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is considered to be part of the new system. The existing waste system can be used as part of the waste handling system without being retrofitted as long as it is not used in series with the new structures required for expansion.

An operation may be able to manage a greater waste load by reducing temporary storage period and modifying their WUP to apply waste more often. However, an analysis must show that sufficient temporary volume is available while meeting all remaining NRCS Practice Standard Code 359 volume and depth criteria. Also with an expansion, the heavy rainfall, excess water and sludge volumes must be included.

A swine operation may change the type of animals (feeder to finish, farrow to wean, etc.) and not be an expansion under 2T .1300 (formerly 2H .0200) provided the design capacity of the existing waste management system (lagoon, storage structure, etc.) is not increased and is adequate to handle the waste from the larger number of animals. An example would be a system designed for 500 sows, farrow to wean and the owner would like to convert the operation to a feeder to finish operation. According to NRCS standards, the steady state live weight of the farrow to wean operation would be 500 x 433 lbs/sow or 216,500 lbs SSLW. The steady state live weight for feeder to finish hogs is 135 lbs/animal and therefore the operation could accommodate 216,500/135 or 1604 finishing hogs as designed. Any increase in the steady state live weight of this operation over 216,500 would be an expansion under 2T .1300 (formerly 2H .0200).

As of January 1, 2009, expanding swine operations that raise 250 or more animals must meet the performance standards pursuant to 15A NCAC 02T .1307.

4.3 Innovative Systems

Innovative systems (e.g., package plants) or systems not covered by standard agricultural specifications are not covered by the general permit and must apply to DWQ for an individual permit. Innovative systems only designed to collect gases from conventional anaerobic lagoons to use for energy or only for solids separation are not required to obtain an individual permit.

4.4 Fencing of Animals Out of Creeks

There is no requirement that animals must be automatically fenced out of creeks. Specific guidance is however given in Appendix 5.1A, 5.1B and 5.2. In cases not covered by these guidelines, fencing is not required unless the animals' accessibility to the stream results in an environmental problem. As technical specialists work with facilities, they should evaluate stream access sites and make appropriate recommendation to protect the facility from future enforcement for water quality violations.

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5 GUIDANCE BY ANIMAL AND OPERATION TYPES

5.1 ***Dairies & Beef Feedlots***

All operations with 100 or more cattle sharing a feedlot shall have a CAWMP and must receive coverage under a permit from the DWQ. The number of cattle on a dairy farm is the maximum number of animals that are milked at the site plus any other cattle that are fed and/or contribute waste in the immediate vicinity of the milked cows. An example of a dairy with 100 cattle or more would be designed to milk a maximum of 80 cows with 20 or more other cattle (calves, dry cows, replacement heifers, etc.) that are in the same concentrated area of the dairy as the cows to be milked. An example of a dairy with less than 100 cattle would be designed to milk a maximum of 80 cows but which keeps all other cattle on open pasture with established vegetation separated from the cows that are milked. These cows shall be either fenced on pasture on another part of the same farm on which the milking takes place or on another farm at a different location.

When developing a CAWMP for a dairy or beef feedlot operation, a technical specialist shall develop a complete plan that addresses all water quality issues on the farm, both the confined areas and the pastures. The plan shall address the need for stream crossings, stock trails, fencing, rotation of the lounging and feeding areas, as well as any other problem area identified by the technical specialist (Appendix 5.1A).

Although runoff from silos (silage) is not defined as animal waste unless it is mixed with livestock or poultry excreta, it is a waste and can be a serious environmental problem. Therefore as the technical specialist develops the CAWMP, they should consider silage runoff. As with other sources of waste, every effort shall be made to minimize rainwater that comes into contact with the silage (by the use of gutters, roofs and diversion ditches) and either collect the liquid or in some other way treat it to ensure only a de minimus discharge of pollutants in a storm event less severe that the 25-year, 24-hour storm event.

A cattle operation that has an existing waste storage structure can be certified when the herd is expanded without increasing the size of the waste storage pond. However, the storage structure and WUP shall meet current standards. In some cases, the farmer may reduce waste storage time instead of increasing waste storage volume. This will depend on the type of soil, land availability, crop, flood plain, etc. If the manure can be applied more frequently, the plan could be certified with the existing storage structure.

Guidelines for developing CAWMP for unpaved beef feedlots are provided in Appendix 5.1B.

5.2 ***Swine Dry Lots***

General guidelines for swine on dry lots have been developed (Appendix 5.2).

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5.3 ***Animal Waste Management Plans (AWMP) for Dry Litter Systems***

Dry litter poultry systems with 30,000 or more birds were required to develop an AWMP by January 1, 2000. These plans are required to comply with the testing and reporting requirements included in Appendix 5.3. Since the statute did not specify that these plans had to be certified by a technical specialist, any qualified person including but not limited to a technical specialist can develop them. Included with the guidelines is a third party applicator agreement that shall be signed by each third party applicator that receives litter from a facility.

Although poultry systems with less than 30,000 birds are not required to develop a AWMP they are required to prevent waste discharges to surface waters and groundwater. They are also encouraged to meet the same minimum standards and specifications as required for approval of the AWMP. DWQ may on a case by case basis determine that a facility should not be deemed permitted and shall be required to apply for an individual permit.

A 25-foot vegetative buffer is required between the land application area and perennial waters for third party receivers of litter or if a wet waste application system is used.

While not required, it is highly recommended that a 25-foot vegetative buffer is maintained between the perennial waters and the waste generator's (poultry farm) land application area since it is still the responsibility of the applicator to insure that the waste does not reach the surface waters.

In accordance with 2T .1303(2), litter shall not be stockpiled closer than 100 feet from a perennial stream or perennial waterbody, and shall not be stockpiled uncovered for greater than 15 days. In addition, if a manure hauler(s) is used, additional records must be maintained (see item 7.5).

5.4 ***Manure Haulers for Poultry Litter***

Producers still need to develop and implement an AWMP even though a manure hauler is involved. The producer is still responsible for a) contracting with a manure hauler who can properly manage the manure; the producer shall have a written agreement with the manure hauler that establishes the responsibilities for the proper management of the manure, b) keeping a record of the name, address and phone number of the manure hauler, c) keeping a record of the amount of litter removed by each manure hauler, d) providing an appropriate waste analysis to the manure hauler, e) providing a copy of Appendix 5.3 to the manure hauler.

Manure haulers must be deemed permitted by DWQ in accordance with 2T .1400 or have an individual manure hauler permit from DWQ to contract with poultry producers.

For more information about manure haulers and permit requirements, see item 7.5.

5.5 ***Dry Litter Poultry Operations with NPDES Permits***

Dry litter operations with coverage under NPDES permits are subject to additional permit requirements. See Appendix 5.5.

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6 WASTE APPLICATION, WETTABLE AND EFFECTIVE IRRIGATED ACRES

6.1 ***Wettable Acres in a CAWMP***

Wettable acres requirements apply to all facilities with irrigation systems. Systems using honey wagons and solid spreaders exclusively will not be affected. Acres which are wetted by an irrigation system with a 50% to 70% of wetted diameter sprinkler spacing or 60% to 90% of wetted diameter traveler lane spacing are considered wettable acres and can be counted in the CAWMP.

Wettable acres for spray fields with irrigation systems having excessive spacing, single pulls or a single row of stationary sprinklers, are limited to that portion of the spray field receiving a more uniform coverage. Wettable acres calculations are based on a width of 90% of wetted diameter for travelers or a single row of stationary sprinklers and 78% of wetted diameter for excessively spaced stationary sprinklers. Any overlap areas must only be counted once.

Wettable acres determination will be required on operations with a) more than 75% of the farm's total acres (on a per field basis) credited in the CAWMP as acres receiving waste and b) operations where this determination cannot be made due to lack of documentation, and c) a farm has a history of over application due to lack of spray field acres and/or the fields have obvious limitations past the 75% rule (i.e. ditches and/or odd shaped areas not irrigatable etc.) will be flagged for evaluation.

Operations will be flagged for evaluation on the inspection form through the Operation Review and Compliance Inspection processes, or through the permit application process. After an operation is flagged, DWQ will notify the producer by certified mail requiring a wettable acre determination with the needed corrective action to be completed within six months.

Operations will not be flagged for evaluation if they have one of the following components included in the CAWMP:

- An irrigation design and field map depicting wettable acres signed by an I or PE.
- D1 and D2 irrigation operating parameter sheets including field maps depicting wettable acres signed by an I or PE.
- D1 irrigation operating parameter sheet including field maps depicting wettable acres signed by a WUP Specialist.

Any producer that cannot meet the 6-month due date may request an administrative agreement with a compliance schedule from DWQ. Facilities that fail to provide adequate justification will be subject to appropriate enforcement actions.

Any facility that may have difficulty meeting the wettable acres criteria should identify a solution as soon as possible. Upon request by the producer/owner, DWQ will work closely with facilities with hardship cases in an attempt to reach an amicable solution for DWQ and the producer/owner.

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Wettable acres will be documented on the Wettable Acre Determination Field Data & Computation Worksheets that apply to the irrigation system (see NCCES Publications (Irrigated Acreage Determination Procedures for Wastewater Application Equipment, Stationary Sprinklers AG-553-6, Hard Hose Traveler AG-553-7.)), completed and signed by the producer and a technical specialist (WUP/WA, I/WA, or PE designation). This form, including a wetted acres map becomes part of the waste management plan on file at the SWCD office and farm. Technical Specialists with I or WUP designation attending a full training session on wettable acres may receive WA designation.

If an operation has been pended due to lack of documentation to support a Wettable Acre Determination, DWQ will notify the producer by certified mail requiring them to supply the necessary information to the Compliance Inspector or Operation Reviewer who initially pended the facility. This information is to be completed within three months of receiving the certified letter. If the Inspector or Reviewer does not receive information within three months, the producer has only three additional months to complete the full Wettable Acre Determination and submit the Wettable Acre Determination Certification (Appendix 6.1) to the address listed on the form.

When a pended facility submits their information, the inspector or reviewer will log in the date received in the compliance database. Once the information is reviewed the inspector or reviewer will send a letter letting the producer know the current status. In the event this facility fails to provide adequate information to be exempt from a Wettable Acre Determination the facility will be sent a second letter when the facility has been selected.

Any facility that has been flagged can submit information to the inspector or reviewer who flagged the facility for review in order to be exempt. This is allowed only if the flagged facility has not received a formal letter starting the six-month clock on their wettable acre determination.

All facilities that have been flagged for a wettable acre determination and have submitted the certification form will be reviewed by the inspector or reviewer at their next inspection by the flagging agency that initiated the flag.

6.2 Irrigation Record Keeping Methods

If a producer is keeping adequate records by field, he or she shall be allowed to continue using this record keeping system without penalty. Producers shall be encouraged to keep records by pull or zone. During the annual inspection or operation review, the inspector or reviewer has the responsibility to determine if record keeping is adequate. If the inspector/reviewer determines that a producer is keeping records inadequately by field, he or she must document in the report why the record keeping was inadequate, and then may require the producer to keep irrigation records either by pull/zone and/or to correct existing records. Acreage and irrigation records shall match acreage and irrigation records of CAWMP.

6.3 Maximum Irrigation Amount

The maximum irrigation-loading rate per irrigation event shall be based on a site evaluation. A maximum of no more than one inch per irrigation event (24 hour period) is allowed unless there is evidence, through soil moisture measurements, that the soil is capable of absorbing more effluent in the root zone, and provided no runoff occurs.

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6.4 Irrigation Design Criteria

A design crediting *effective irrigated acres* must be used for installing irrigation equipment. The design must meet the recommendation of NCCES, which agrees with the irrigation uniformity coefficient in NRCS Irrigation Standard 442. NCCES recommends a range of 60 to 78% of wetted diameter for lane spacing for travelers and 50 to 65% of wetted diameter for stationary sprinklers NCCES publication (AG-553-6) Stationary Sprinkler Irrigation Systems columns D, E, and G in Table 1 through 4 provide acceptable sprinkler area allowances for effective wetted acres. NCCES publication (AG-553-7), Hard Hose Traveler Irrigation System, tables NE60 through N75+ provides acceptable area allowances for the traveler end areas.

Effective irrigated acres design requirements shall be met for

1. Irrigation equipment installed on a new spray field after February 1, 1999,
2. New irrigation system on an existing spray field after February 1, 1999, and
3. Underground hydrant lines after February 1, 1999.

In an existing system, replacing equipment with similar items does not require meeting effective design requirements. For existing spray fields, wettable acre criteria can be used to determine WUP acres even though effective design requirements shall be met. When an existing irrigation system is replaced, the new system shall be certified. The new system must meet buffer and setback requirements at the time the original system was installed.

Setback requirements are dependent upon the date the spray field is put into use. Therefore, plan revisions do not require setback changes unless a new spray field is added or expanded as described in Section 8.1.

6.5 Irrigation Design Checklist

A comprehensive checklist has been compiled to assist technical specialists with irrigation system design (Appendix 6.5).

6.6 Calibration Requirements

All waste application equipment, including irrigation systems, hose drag systems, honey wagons, and solid spreaders must be field tested and calibrated to verify operating performance and application amount. Field calibration to verify application amount is required once a year for NPDES permitted facilities and once every other year for state permitted operations.

Irrigation Systems - calibration involves field verification of 1) operating pressure, 2) wetted diameter, 3) flow rate, and 4) application uniformity.

The minimum calibration performance requirements for irrigation systems are:

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1. Operating pressure at the sprinkler/gun must be verified using a properly functioning pressure gauge and observed to be operating within the range recommended by the manufacturer or specified in the irrigation design documentation for the equipment being calibrated.

2. Wetted diameter of the system being field calibrated must be measured as described in NCCES Irrigated Acreage Determination publications AG-553-6 or AG- 553-7 and observed to be within 15% of the wetted diameter reported in the manufacturer's chart for the operating pressure observed in (1), AND

3. Flow rate must be determined to be within 10% of the value specified in the irrigation design documentation or as was determined during the wettable/effective irrigated acre determination. Flow rate shall be determined using EITHER -

    a. Flow rate from manufacturer's chart for the measured pressure at the sprinkler/gun (item 1) and measured sprinkler/gun orifice diameter, OR

    b. Flow rate measured with an approved, calibrated flow meter.

4. **Application uniformity is deemed to be acceptable when items 1 – 3 above are within the ranges specified.**

Note: Flow rate to be reported in column 6 of IRR-2 (item 3 above) should not be calculated from "catch can" measurements as described in NCCES field calibration publications AG-553-1, Ag-553-2 or AG- 553-3. The catch can method cannot be used to compute flow rate for IRR-2 because this results in a "double counting" of the evaporative PAN losses during the irrigation process.

Hose Drag Systems - should be field calibrated by measuring ground speed and effective applicator width as outlined in NCCES publication AG-634, and flow rate using a flow meter as described in 3b above. The application rate can be determined from tables presented in AG-634 and should be verified against application rates specified in the WUP.

Solid Spreaders – should be field calibrated using the Weight-Area Method as described in NCCES publication AG-553-4.

Honey Wagons – Liquid and semi-solid application equipment should be field calibrated using the Load Area Method as described in NCCES publication AG-553-5.

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7 PERMITS

7.1 ***Issuance of Permits to Animal Waste Management Facilities***

Beginning January 1, 1997, DWQ began issuing COC under general permits and individual permits for facilities with 250 or more swine, 100 or more cattle, 75 or more horses, 1,000 or more sheep or 30,000 or more poultry with a liquid waste management system. In 2003, DWQ began issuing COC under NPDES general permits in accordance with federal rules for some farms. Facilities with fewer animal numbers may continue to be deemed permitted as long as they remain in compliance. DWQ may however require any facility to apply for a permit based on existing or projected environmental impacts.

DWQ will notify each facility by certified mail as to the date by which they shall submit the permit application. Regulations dictate a facility that fails to submit an application to DWQ by the date specified shall not operate the facility after that date. Every day of operation after that date is considered an additional violation subject to appropriate enforcement actions.

Regulations dictate no person shall construct a new or expanding facility without first receiving a permit from DWQ.

Farm owners should contact DWQ prior to construction of a lagoon or holding pond. For storage structure construction on an existing, expanding, or new operation, DWQ requires approval of the design before construction begins.

7.2 ***Truck Washes***

Truck washes located at a farm may be deemed permitted or covered under the general permit process as a part of a farm if the truck transports animals from that farm and returns to that farm to be washed, or the truck brings animals to the farm and is washed at the farm.

The animal waste management system shall be designed to adequately handle the volume of the waste from the truck wash and no chemical is added to the truck wash water that would interfere with the treatment system.

Truck washes serving more than one farm are commercial operations and not animal raising operations. Therefore they shall apply for and receive an individual permit before they can legally operate.

7.3 ***Public Livestock Markets***

As per NCGS 143-215.10B, public livestock markets are considered animal operations and must be permitted. Therefore, any waste management system serving a public livestock market shall be covered by a permit before it can legally operate.

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7.4 ***Permit Fees***

Invoices for the annual fees will be mailed annually.

7.5 ***Manure Haulers***

DWQ Rules specifically for manure haulers became effective on September 1, 2006 and are contained in 15A NCAC 2T .1400. Manure haulers are defined as any person who accepts or purchases animal waste and land applies the animal waste on land not covered by the generator's permit.

The Rules cover all manure haulers regardless of how much or how little manure they land apply. All manure haulers are deemed permitted as long as they comply with specific criteria established in the Rules.

Manure haulers that land apply 100 tons or less of animal waste per calendar year are deemed permitted as long as they do not have a discharge of waste to the surface waters, they land apply the waste at no greater than agronomic rates and they do not land apply the waste closer than 25 feet from perennial streams or perennial waterbodies. Agronomic rates based on Realistic Yield Expectations (RYE) can be found at http://www.soil.ncsu.edu/nmp/yields/

Manure haulers that land apply more than 100 tons of animal waste per calendar year are deemed permitted as long as they do not have a discharge of waste to the surface waters; they land apply the waste at no greater than agronomic rates; they do not land apply the waste closer than 25 feet from perennial streams or perennial waterbodies; they do not stockpile animal waste uncovered for greater than 15 days; they do not stockpile animal waste within 100 feet of a perennial stream or waterbody; they only apply animal waste on fields that have had a representative Standard Soil Fertility Analysis within the past 3 years; they register with DWQ by no later than September 1, 2007; that they submit an annual report to DWQ by March 1 of each year. The first annual report is due to DWQ for calendar year 2007 on March 1, 2008.

Manure haulers that expect to land apply more than 100 tons of animal waste per calendar year and were not in operation before September 1, 2006 must register with DWQ prior to accepting or purchasing manure.

Manure haulers that land apply more that 100 tons but less than 750 tons of animal waste per calendar year must submit an annual report that includes their name, mailing address and phone number; date, location and amount of animal waste received; and date, location, amount, and acreage of all animal waste land applied.

Manure haulers that land apply 750 tons or more of animal waste per calendar year must submit an annual report that includes their name, mailing address and phone number; date, location and amount of animal waste received; and date, location, application rate, acreage, waste analysis, and receiving crop of all animal waste land applied.

Manure haulers that land apply 100 tons or less of animal waste per calendar year are not required to submit an annual report.

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If there are problems with the manure hauler's operation, DWQ may initiate an appropriate enforcement action and/or the Director of DWQ may determine that the manure hauler should no longer be deemed permitted and be required to apply for an individual manure hauler permit from DWQ.

Manure hauler application and reporting forms can be found at
http://h2o.enr.state.nc.us/aps/afou/afou_home.htm

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8 SWINE FACILITY SITING REQUIREMENTS

8.1 ***Setback Requirements***

The 100-foot setback from lagoons or houses to property boundaries was required for operations sited between October 1, 1995 and October 1, 1996. This setback was increased to 500 feet for operations sited after October 1, 1996

Effective August 27th, 1997, HB 515 requires at least 1,500 feet from a swine house or lagoon to any occupied residence and 2,500 feet of setback from a swine house or a lagoon to any outdoor recreation facility, National Park, State Park, historic property, or child care center. A 500-foot setback is required from a swine house or a lagoon to any well supplying water for human consumption or to a public water supply system. This requirement does not apply to a well located on the same tract of land as the swine house or lagoon and that supplies water only for use on that tract of land or for the use on adjacent tracts of land all of which are under common ownership or control. The setback requirements in HB 515 do not apply if the facility was permitted and construction began before August 27, 1997. All new or expanding facilities permitted after that date or which began construction after that date, regardless of the permitted date, shall meet the new requirements. Land application setbacks are shown in Appendix 8.1.

8.2 ***Public Notice for Swine Farms***

Effective June 21, 1996, any person who intends to construct a new or expanding swine farm with 250 or more animals shall, after completing a site evaluation and before the farm site is modified, attempt to notify all adjoining property owners and all property owners who own property located across a public road, street, or highway from the swine farm of that person's intent to construct the swine farm. This notice shall be sent by certified mail to the address on record at the property tax office in the county in which the land is located. Written notice shall include:

- The name and address of the person intending to construct a swine farm.
- The type of swine farm and the design capacity of the animal waste management system.
- The name and address of the technical specialist preparing the waste management plan.
- The address of the local Soil and Water Conservation District office.
- Written comments may be submitted to: DWQ Animal Feeding Operations Unit, 1636 Mail Service Center, Raleigh, NC 27699-1636.

8.3 ***Site Evaluations***

NCGS 106-802. (4) defines "site evaluation" as an investigation to determine if a site meets all federal and state standards as evidenced by the Waste Management Facility Site Evaluation Report on file with the SWCD office or a comparable report certified by a PE or by a technical specialist approved by the SWCC. The Waste Management Facility Site Evaluation Report is NRCS form NC-CPA-17 (Appendix 8.3). A comparable report would be one that contains all of the information on NC-CPA-17.

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NRCS form NC-CPA-17 contains a condition that the site evaluation is only valid for 12 months from the date the form was signed. SB 1217 (NCGS 106-802.(4)) does not specify a time at which a site evaluation will no longer be valid. Therefore, while NRCS may no longer honor the site evaluation, the evaluation will still be valid for meeting site evaluation requirements.

Exemptions to 'Swine Farm Siting Act' include:

- When construction or enlargement increases the swine population to that predicted in the registration filed with DENR prior to October 1, 1995.

- When construction or enlargement for the purpose of increasing the swine population to that which the animal waste management system is designed to accommodate as described in a registration of the swine operation filed with DENR before October 1, 1995, or as described in a CAWMP approved before October 1, 1995.

- When construction or enlargement is for the purpose of complying with animal waste management rules and not for the purpose of increasing the swine population.

8.4 ***Conversion Factors for Determining Swine Farrowing Numbers***

The population of swine on a farm is determined by the number of sows multiplied by 10 for a farrow to finish operation, the number of sows multiplied by 4 for a farrow to feeder operation, and the number of sows multiplied by 2.5 for a farrow to nursery operation. Where boars are unnecessary, they may be replaced by an equivalent number of sows. Any of the sows may be replaced by gilts at a rate of 4 gilts for every 3 sows.

NOTE: The SB 1217 Guidance Committee has not been given the authority to administer provisions of the Swine Farm Siting Act. The interpretations given above (sections 8.3 and 8.4) reflect internal policies for administering the animal waste system program. If there are questions regarding individual rights or responsibilities under the Act, consideration should be given to obtaining appropriate legal counsel.

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9 BUFFERS AND PERENNIAL STREAMS

9.1 Buffer Design and Waste Structure Setbacks

Buffers must be established in accordance with NRCS technical standards unless specifically established in regulations. Setbacks for structures must be measured from the toe of the impoundment to the edge of perennial waters. Setbacks from the land application site must be measured from the areas on the fields where waste is applied (wetted area).

The USGS uses blue or purple lines on topographic maps to denote field ditches and canals as well as perennial streams. The 2T .1300 (formerly 2H .0200) buffer requirements only apply to perennial streams and perennial waterbodies, and use USGS maps as some evidence of the location of these streams. USGS maps show ditches and canals as "straight" blue lines. If the lines are not exactly "straight", the waters have been determined to be a stream rather than a canal or a ditch. The lines can be either a single straight line or a series of straight lines connected at angles. While the angle of connection is normally 90°, they can also be at other angles.

For possible consideration for a buffer exemption, a technical specialist can only evaluate straight lines to determine that a stream shown on an USGS map is perennial water. While generally straight lines denote a canal or ditch that does not require a buffer, the technical specialist still has the responsibility to make an "on site" determination.

Use the following guidance to assist in making an "on site" determination of whether a field ditch or a canal should have a buffer for waste application.

- Typical field ditches that are above a junction with another ditch (first order) would almost always not require a buffer under 2T .1300 (formerly 2H .0200). (A hoe drain is not considered a ditch.). Once the site inspection by the technical specialist verifies that the blue line is a first order field ditch, no other evaluation is necessary. Documentation of the field visit shall be included in the CAWMP.
- In cases where a ditch is below a junction with another ditch (2nd order or greater) then the technical specialist is responsible for a more extensive evaluation. Factors related to perennial stream flow are 1) occurrence of flow during extreme drought (not dry on an annual basis), 2) drainage area greater than 2 square miles in the coastal plain (excluding the Sandhills), and 3) evidence or knowledge of the previous existence of a natural channel.
- A technical specialist shall visit a site and actually evaluate a field ditch or a canal before making the buffer determination. The technical specialist shall use the most recent edition of the USGS map(s) to make the required determination. The edition of the map(s) used must be documented.

9.2 How are Distances Measured from Perennial Streams?

Distances from perennial streams should be measured from the top of the stream bank in a horizontal line.

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9.3 ***Defining Setbacks & Buffers***

New and expanded animal waste storage and treatment facilities sited after February 1, 1993, such as but not limited to lagoons and waste storage ponds, must be located at least 100 feet from perennial waters unless it can be documented that no practicable alternative exists and that equivalent controls are used as approved by the SWCC.

When wet waste is applied, an application setback to perennial waters is required as part of the waste application system and nutrient management plan. Perennial waters are indicated on the most recent published version of USGS 7.5 minute topographic maps (see item 9.1). See Appendix 8.1 for specifics on application setback widths to perennial waters.

North Carolina regulations require that the first 25 feet of the land application setback area adjacent to perennial waters be established as a buffer. 15A NCAC 02B .0202 (12) defines a "buffer" as *a natural or vegetative area through which stormwater runoff flows in a diffuse manner so that the runoff does not become channelized and which provides for infiltration of the runoff and filtering of the pollutants. The buffer shall be measured landward from the normal pool elevation of impounded structures and from the bank of each side of streams or rivers*. This definition is consistent with the Filter Strip definition in NRCS Standard Code 393. The Filter Strip standard requires vegetation that is primarily permanent grass, legumes, or forbs, a combination of these and shrubs and/or trees are also acceptable as the required permanent vegetative "buffer" in the first 25 feet. The additional width of the setback, where required, does not have to be in permanent vegetation, and may be in crop production, although the specified waste application setback must be observed.

Filter strip requirements apply to animal waste applied *adjacent* to perennial waters. Although there is no specific definition for *adjacent* in the NRCS Standards, if a producer maintains at least 100 feet setback from perennial waters, the wetted land application area can be considered as not *adjacent*. If the site has a considerable slope, the distance may need to be increased.

Effective July 1, 2007, facilities operating under NPDES permits, must implement additional setbacks and/or approved setback/buffer combinations from surface waters and conduits to surface waters (perennial and non-perennial) for waste application activities. See Appendix 8.1 for setback and setback/vegetative buffer options and related width requirements.

Vegetative buffers adjacent to non-perennial waters are recommended but not required for facilities operating under State Non-Discharge Permits. However, the waste application system must be designed and implemented in a manner that will not allow waste to enter any intermittent stream, canal, or drainage ditch. A suitable distance must be maintained from these water features to prevent wind drift or runoff of waste materials from entering these waters. Other federal, state or local regulatory authority may supercede the above conditions on non-perennial waters.

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10 TECHNICAL SPECIALIST

10.1 ***Liability***

Technical specialists can only certify systems and plans that meet the appropriate minimum criteria. If for some reason a producer cannot obtain a certification by a technical specialist, then the producer shall modify the system so that it can be certified.

Technical specialists are subject to lawsuits. The State Attorney General's office can only defend state employees.

Technical specialist designation categories are shown in Appendix 2.5B.

10.2 ***Professional Engineer Seals***

In accordance with guidance received for the North Carolina State Board of Examiners for Engineers and Surveyors, the PE is required to seal any part of the certification which they sign and any part of the plan that they design.

10.3 ***Decertification of Technical Specialist***

The responsibility for technical specialist designation lies with the SWCC. Written complaints shall be directed to the Director of the DSWC and will be handled through a process established by the SWCC.

10.4 ***Certification Program of Irrigation Association***

The SWCC adopted policy is to consider an individual appropriately certified under the ***Certified Irrigation Designer*** (CID) program of the Irrigation Association as having the technical qualifications to receive the "I" technical specialist's designation.

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11 OPERATOR CERTIFICATION REQUIREMENTS

11.1 ***When Must a Facility Have a Certified Operator?***

All facilities with 250 or more swine, 100 or more confined cattle, 75 or more horses, 1,000 or more sheep or 30,000 or more poultry with a liquid waste management system shall have a certified Operator in Charge (OIC). The operator is for the entire system so a certified operator is required on that date even if land application will not occur until some later date. A facility shall notify DWQ within 30 days after a new Operator in Charge is designated (see Appendix 11.1 A).

The Attorney General's Office advises that "animal operations not producing liquid residuals … are not required to designate a certified operator…" and "…systems utilizing only nonstructural practices (for the management of animal waste) are exempt from the requirement to have a certified operator" (Appendix 11.1 B).

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12 APPENDICES

1.1A Waste Application Windows for Common Crops Which Receive Animal Waste, 9/19/06
1.1B Emergency Action Plan, 12/18/96
1.1C Cattle Farm Waste Management Odor Control Checklist, 4/18/06
1.1D Swine Farm Waste Management Odor Control Checklist, 11/11/96
1.1E Poultry Layer Farm Waste Management Odor Control Checklist, 11/11/96
1.1F Insect Control Checklist for Animal Operations, 11/11/96
1.1G Mortality Management Methods, 12/18/96

1.20 Guidelines for Plant Tissue Analysis to Justify Additional Waste Applications and/or Extending Application Windows, 8/14/06

1.21A Crop Management Practices for Select Forages Used in Waste Management, Dr. Jim Green, 7/13/98

1.23 Use of On-Farm Records for Modifying a Certified Animal Waste Management Plan, AG-439-42, 9/2000

1.26A **NCCES Sludge Survey Form and Worksheets**

1.26B DSWC Copper and Zinc projection worksheet – EXAMPLE, 6/5/03

1.31 RYE Values for Superior Lines of Seeded Bermudagrass (INMC 8/17/06)

1.32 **Animal Waste Application on Turf Sods**

2.2A Notification of Change of Ownership Form, 11/1/04
2.2C Request for Reactivation, RR 7/00

2.4 Components of an Animal Waste Management Plan, 12/6/96

2.5A Animal Waste Management Plan Certification Form, AWC 9/18/06
2.5B SWCC Criteria for Technical Specialists Designation, 3/23/04

3.1 Animal Waste Storage Pond and Lagoon Closure Form, PLC-1 3/18/02

5.1A General Guidelines for Dairies & Paved Beef Feedlots, 9/18/06
5.1B General Guidelines for Unpaved Beef Feedlots, 7/23/97

5.2 General Guidelines for Swine on Dry Lots, 7/23/97

5.3A Poultry Dry Litter Management Plan, DPLMP 3/17/97
5.3B Poultry Dry Litter Forms 1-3 3/17/97

5.5A Poultry Litter Nutrient Management Plan for NPDES Facilities 1/4/05
5.5B NPDES DRY-1 (10/27/04)

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5.5C NPDES DRY-2 (10/27/04)
5.5D NPDES DRY-3 (10/27/04)

6.1 Wettable Acre Determination Certification, WADC 2/06

6.5 Animal Wastewater Land Application System Plans Design Checklist, 7/23/97

7.5 Registration Form for Manure Hauler Operations (REG-MHO 12/06)
Manure Hauler Operation Annual Reporting Form 2/21/07

- Manure Received HAUL-1 (2/21/07)
- Manure Land Application - Medium Operations (100-750 tons/yr) (2/21/07)
- Manure Land Application - Large Operations (750 or more tons/yr) (2/21/07)

8.1 Animal Waste Land Application Setbacks, 9/20/06

8.3 Waste Management Facility Site Evaluation (NRCS NC-CPA-17, 12/00)

11.1A Operator in Charge Designation Form
11.1B Classification of Animal Waste Management Systems (WPCSOCC 7/21/98)

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13 Website Sources of Technical, Regulatory and Policy Information (revised January 26, 2007)

SOURCE	COMMENTS	ADDRESS
NC Department of Agriculture & Consumer Services	NCDA&CS Homepage	http://www.ncagr.com/index.htm
• Agronomic Division	Homepage	http://www.ncagr.com/agronomi/index.htm
	Soils & Waste Analysis	http://agronomy.agr.state.nc.us/
NC Department of Environment & Natural Resources	DENR Homepage	http://www.enr.state.nc.us/
	DENR Regional Office Listing	http://www.enr.state.nc.us/html/regionaloffices.html
• Division of Air Quality	Homepage	http://daq.state.nc.us/
• Division of Soil & Water Conservation	Homepage	http://www.enr.state.nc.us/DSWC/
	1217 Guidance Document	http://www.enr.state.nc.us/DSWC/pages/guidance_docs.html
	Designated Technical Specialists List	http://www.enr.state.nc.us/DSWC/pages/TechSpec_List.pdf
	Soil & Water Conservation District Directory	http://www.enr.state.nc.us/DSWC/pages/district offices.html
• Division of Water Quality	Homepage	http://h2o.enr.state.nc.us/
• DWQ - Animal Feeding Operations Unit	Homepage	http://h2o.enr.state.nc.us/aps/afou/afou_home.htm
	Reporting Forms	http://h2o.enr.state.nc.us/aps/afou/afou_home.htm
	Permits	http://h2o.enr.state.nc.us/aps/afou/applications.htm
• DWQ - Laboratory Section	Laboratories Certified for Animal Waste Nutrient Mgt. Analyses	http://h2o.enr.state.nc.us/lab/animalwaste.htm
	NC Wastewater Certified Laboratories	http://h2o.enr.state.nc.us/lab/nccert.htm

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• DWQ - Technical Assist. & Cert. Unit (certified waste operators)	Homepage	http://h2o.enr.state.nc.us/tacu/index.html
	Training opportunities and announcements for animal waste operators	http://h2o.enr.state.nc.us/tacu/TrainingOpportunities2.html
NC General Assembly	Homepage	http://www.ncga.state.nc.us/
	Bill Information	http://www.ncga.state.nc.us/Legislation/Legislation.html
	NC Statutes	http://www.ncga.state.nc.us/gascripts/Statutes/Statutes.asp
	NC Session Laws	http://www.ncga.state.nc.us/gascripts/EnactedLegislation/ELTOC.pl?sType=Law
NC State University	Homepage	http://www.ncsu.edu/
• College of Agriculture & Life Sciences	Smithfield Agreement and Development of Environmentally Superior Technologies	http://www.cals.ncsu.edu:8050/waste_mgt/smithfield_projects/smithfieldsite.htm
• Cooperative Extension Service	Homepage	http://www.ces.ncsu.edu/
	County Offices	http://www.ces.ncsu.edu/index.php?page=countycenters
	Online Publications	http://apps.ces.ncsu.edu/pubs/
• CES - Crop Science	Homepage	http://www.cropsci.ncsu.edu/
• CES - Biological & Agricultural Engineering	Animal Waste Management	http://www.bae.ncsu.edu/programs/extension/manure/awm/index.htm
	Calibration Procedures	http://www.bae.ncsu.edu/programs/extension/manure/calibration
	Sludge Management & Closure Procedures for Anaerobic Lagoons	http://www.bae.ncsu.edu/programs/extension/manure/ag604.pdf
	Sludge Survey Methods for Anaerobic Lagoons	http://www.bae.ncsu.edu/programs/extension/manure/sludge-survey/sludge_survey.pdf
• CES - Soil Science	Homepage	http://www.soil.ncsu.edu/
	Realistic Yield Expectations Database	http://www.soil.ncsu.edu/nmp/yields/
	Nutrient Management &	http://www.soil.ncsu.edu/nmp/ncnmwg/

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	PLAT software downloads	
	Waste Management Publications	http://www.soil.ncsu.edu/programs/wasteman/
	Animal Waste Operators Certification Training	http://www.soil.ncsu.edu/certification/index.htm
• CES - Soil Science	Land Application Training & Demonstration Center	http://www.soil.ncsu.edu/swetc/latdc/index.html
USDA Natural Resources & Conservation Services	National Homepage	http://www.nrcs.usda.gov/
	National Field Office Technical Guide	http://www.nrcs.usda.gov/technical/efotg/
	Animal Waste Management	http://www.wcc.nrcs.usda.gov/awm/
North Carolina NRCS	N.C. Homepage	http://www.nc.nrcs.usda.gov/
	Electronic Field Office Technical Guide	http://www.nrcs.usda.gov/technical/efotg/index.html

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THE NORTH CAROLINA 1217 INTERAGENCY GROUP
1614 Mail Service Center • Raleigh, NC 27699-1614
Phone: 919.733.2302 Fax: 919.715.3559

October 1, 2009

MEMORANDUM:

TO: All Technical Specialists designated by the Soil and Water Conservation Commission to Implement Animal Waste Regulations (15A NCAC 2T .1300)

FROM: Coleen Sullins, Director, Division of Water Quality
Patricia K. Harris, Director, Division of Soil and Water Conservation
Mary K. Combs, State Conservationist, USDA - Natural Resources Conservation Service
Jon Ort, Director, N.C. Cooperative Extension Service
Steve Troxler, Commissioner, N.C. Department of Agriculture and Consumer Services

SUBJECT: **NINTH** Guidance MEMO
Implementing the Environmental Management Commission's Regulations for Animal Waste Management (15A NCAC 2T .1300)

In an effort to continue to address questions from technical specialists and provide uniform interpretations to technical specialists regarding the requirements of the animal waste management rules, the 1996 session of the General Assembly formalized the creation of an interagency committee. This committee, the SB 1217 Interagency Group, is made up two representatives from each of our agencies.

Please find attached the NINTH Guidance MEMO as adopted by the SB 1217 Interagency Group.

We support the revisions to the NINTH Guidance Document and each of our agencies will continue to work with the committee in the development of future guidance. Most of the guidance was provided in previous memos. The new or changed guidance is noted in bold type and underlined.

In cases where there may be contradictions with past guidance issued by any of the respective agencies, this Guidance will take precedence.

15A NCAC 02D .1802 CONTROL OF ODORS FROM ANIMAL OPERATIONS USING LIQUID ANIMAL WASTE MANAGEMENT SYSTEMS

(a) Purpose. The purpose of this Rule is to control objectionable odors from animal operations beyond the boundaries of animal operations.

(b) Applicability. This Rule shall apply to all animal operations.

(c) Required management practices. All animal operations shall be required to implement applicable management practices for the control of odors as follows:

(1) The carcasses of dead animals shall be disposed of within 24 hours after becoming aware of the death of the animal according to the methods approved by the State Veterinarian for disposal of dead domesticated animals under G.S. 106-403;

(2) Waste from animal wastewater application spray systems shall be applied in such a manner and under such conditions to prevent drift from the irrigation field of the wastewater spray beyond the boundary of the animal operation, except waste from application spray systems may be applied in an emergency to maintain safe lagoon freeboard if the owner or operator notifies the Department and resolves the emergency with the Department as written in Section III.6 of the Swine Waste Operation General Permit;

(3) Animal wastewater application spray system intakes shall be located near the liquid surface of the animal wastewater lagoon;

(4) Ventilation fans shall be maintained according to the manufacturer=s specifications; and

(5) Animal feed storage containers located outside of animal containment buildings shall be covered except when necessary to remove or add feed; this Subparagraph does not apply to the storage of silage or hay or to commodity boxes with roofs; and

All animal operations shall be in compliance with this Paragraph by June 1, 1999.

(d) Odor management plan for existing animal operations for swine. Animal operations for swine that meet the criteria in the table in this Paragraph shall submit an odor management plan to the Director according to the schedule in the table in this Paragraph. The odor management plan shall describe how odors are currently being controlled and how these odors will be controlled in the future. The odor management plan shall contain the elements described in Rule .1803(a) of this Section. The animal operation shall be required to submit its odor management plan only once.

100 pounds steady state live weight of swine		Distance in feet to the boundary of the nearest neighboring occupied property with an inhabitable structure, business, school, hospital, church, outdoor recreational facility, national park, State Park, historic property, or child care center	Date by when the odor management plan is to be submitted
at least	but less than		
10,000	20,000	less than or equal to 3,000	January 15, 2002
20,000	40,000	less than or equal to 4,000	July 15, 2001
40,000		less than or equal to 5,000	January 15, 2001

For the purposes of this Rule, the distance shall be measured from the edge of the barn or lagoon, whichever is closer, to the boundary of the neighboring occupied property with an inhabitable structure, business, school, hospital, church, outdoor recreational facility, national park, State Park, historic property, or child care center. All animal operations for swine that are of the size in the table in this Paragraph shall submit by the date specified in this table either an odor management plan or documentation that no neighboring occupied property with an inhabitable structure, business, school, hospital, church, outdoor recreational facility, national park, State Park, historic property, or child care center is within the distances specified in the table as of the date that the submittal is due. After July 15, 2002, the Director may require existing animal operations for swine with a steady state live weight of swine between 1,000 to 10,000 hundredweights to submit an odor management plan if the Director determines that these animal operations may cause or contribute to an objectionable odor. The Director may require an existing animal operation to submit a best management plan under Paragraph (h) of this Rule if the existing animal operation fails to submit an odor management plan by the schedule in this Paragraph of this Rule.

(e) Location of objectionable odor determinations.

(1) For an existing animal operation that does not meet the following siting requirements:

(A) at least 1500 feet from any occupied residence not owned by the owner of the animal operation;

(B) at least 2500 feet from any school, hospital, church, outdoor recreation facility. national park; State Park, historic property, or child care center; and

(C) at least 500 feet from any property boundary;

objectionable odors shall be determined at neighboring occupied property not owned by the owner of the animal operation, businesses, schools, hospitals, churches, outdoor recreation facilities, national parks, State Parks, historic properties, or child care centers that are affected.

(2) For a new animal operation or existing animal operation that meets the siting requirements in Subparagraph (1) of this Paragraph, objectionable odors shall be determined beyond the boundary of the animal operation.

(f) Complaints. The Director shall respond to complaints about objectionable odors from animal operations as follows:

(1) Complaints shall be investigated to the extent practicable.

(2) Complaints may be used to assist in determination of a best management plan failure or a control technology failure.

(3) The Director shall respond to complaints within 30 days.

(4) Complaint response shall at least include a written response of the Director's evaluation of the complaint.

(5) The investigation of a complaint shall be completed as expeditiously as possible considering the meteorology, activities at the animal operation, and other conditions occurring at the time of the complain.

(g) Determination of the existence of an objectionable odor. In deciding if an animal operation is causing or contributing to an objectionable odor, the Director may consider one or more of the following:

(1) the nature, intensity, frequency, pervasiveness, and duration of the odors from the animal operation;

(2) complaints received about objectionable odors from the animal operation;

(3) emissions from the animal operation of known odor causing compounds, such as ammonia, total volatile organics, hydrogen sulfide or other sulfur compounds at levels that could cause or contribute to an objectionable odor;

(4) any epidemiological studies associating health problems with odors from the animal operation or documented health problems associated with odors from the animal operation provided by the State Health Director; or

(5) any other evidence, including records maintained by neighbors, that show that the animal operation is causing or contributing to an objectionable odor.

(h) Requirement for a best management plan for controlling odors from existing animal operations. If the Director finds that an existing animal operation is causing or contributing to an objectionable odor, the owner or operator of the animal operation shall:

(1) submit to the Director as soon as practical, but not to exceed 90 days after receipt of written notification from the Director that the animal operation is causing or contributing to an objectionable odor, a best management plan for odor control as described in Rule .1803 of this Section; and

(2) be in compliance with the terms of the plan within 30 days after the Director approves the best management plan (compliance with an approved compliance schedule in the best management plan is deemed to be in compliance with the plan).

(i) Requirement for amendment to best management plan. No later than 60 days from completion of a compliance schedule in an approved best management plan or if the best management plan contains no compliance schedule, no later than 60 days from the implementation date of the best management plan, the Director shall determine whether the plan has been properly implemented. If the Director determines that a plan submitted under Paragraph (h) of this Rule does not control objectionable odors from the animal operation, the Director shall require the owner or operator of the animal operation to amend the plan to incorporate additional or alternative measures to control objectionable odors from the animal operation. The owner or operator shall:

(1) submit a revised best management plan to the Director as soon as practical but not later than 60 days after receipt of written notification from the Director that the plan is inadequate; and

(2) be in compliance with the revised plan within 30 days after the Director approves the revisions to the best management plan (compliance with an approved compliance schedule in the best management plan is deemed to be in compliance with the plan).

(j) Plan failure. Any of the following conditions shall constitute failure of a best management plan:

(1) failing to submit the initial best management plan required under Paragraph (h) of this Rule within 90 days of receipt of written notification from the Director that the animal operation is causing or contributing to an objectionable odor;

(2) failing to submit a revised best management plan required under Paragraph (i) of this Rule within 60 days of receipt of written notification from the Director that the animal operation is causing or contributing to an objectionable odor;

(3) failing to correct all deficiencies in a submitted best management plan under Rule .1803(c) of this Section within 30 days of receipt of written notification from the Director to correct these deficiencies;

(4) failing to implement the best management plan after it has been approved; or

(5) finding by the Director, using the criteria under Paragraph (g) of this Rule, that, after the best management plan has been implemented and revised no more than one time (voluntary revisions and revisions made pursuant to 15A NCAC 2D .1803(c) shall not be counted as revisions under this Subparagraph); the best management plan does not adequately control objectionable odors from the animal operation and will not adequately control objectionable odors even with further amendments.

(k) Requirements for control technology. If a plan failure occurs, the Director shall require the owner or operator of the animal operation to install control technology to control odor from the animal operation. The owner or operator shall submit within 90 days from receipt of written notification from the Director of a plan failure, a permit application for control technology and an installation schedule. If the owner or operator demonstrates to the Director that a permit application cannot be submitted within 90 days, the Director may extend the time for submittal up to an additional 90 days. Control technology shall be determined according to Subparagraph (1) of this Paragraph. The installation schedule shall contain the increments of progress described in Subparagraph (2) of this Paragraph. The owner or operator may at any time request adjustments in the installation schedule and shall in his request explain why the schedule cannot be met. If the Director finds that the reason for not meeting the schedule is valid, the Director shall revise the installation schedule as requested; however, the Director shall not extend the final compliance date beyond 24 months from the date that the permit was first issued for the control technology. The owner or operator shall certify to the Director within five days after the deadline for each increment of progress described in Subparagraph (2) of this Paragraph whether the required increment of progress has been met.

(1) Control technology. The owner or operator of an animal operation shall identify control technologies that are technologically feasible for his animal operation and shall select the control technology or control technologies that results in the greatest reduction of odors considering human health, energy, environmental, and economic impacts and other costs. The owner or operator shall explain the reasons for selecting the control technology or control technologies. If the Director finds that the selected control technology or control technologies will effectively control odors following the procedures in 15A NCAC 2Q .0300 or .0500, he shall approve the installation of the control technology or control technologies for this animal operation. The owner or operator of the animal operation shall comply with all terms and conditions in the permit.

(2) Installation schedule. The installation schedule for control technology shall contain the following increments of progress:

(A) a date by which contracts for odor control technology shall be awarded or orders shall be issued for purchase of component parts;

(B) a date by which on-site construction or installation of the odor control technology shall begin;

(C) a date by which on-site construction or installation of the odor control technology shall be completed; and

(D) a date by which final compliance shall be achieved.

Control technology shall be in place and operating as soon as practical but not to exceed 12 months from the date that the permit is issued for control technology.

(l) New or modified animal operations. This Paragraph does not apply to activities exempted from the moratorium on construction or expansion of swine farms in S.L. 1997, c. 458, s. 1.1 provided that the owner or operator demonstrates to the Director that the activity will not result in an objectionable odor.

(1) Before beginning construction, the owner or operator of a new or modified animal operation raising or producing swine shall submit and have an approved best management plan and shall meet the following: A house or lagoon that is a component of an animal operation shall be constructed:

(A) at least 1500 feet from any occupied residence not owned by the owner of the animal operation;

(B) at least 2500 feet from any school, hospital, church, outdoor recreation facility, national park, State Park, historic property, or child care center; and

(C) at least 500 feet from any property boundary;

(2) Before beginning construction, the owner or operator of a new or modified animal operation other than swine shall submit and have an approved best management plan.

(3) For new or modified animal operations raising or producing swine, the outer perimeter of the land area onto which waste is applied that is a component of an animal operation shall be:

(A) at least 75 feet from any boundary of property on which an occupied residence not owned by the owner of the animal operation is located, and

(B) at least 200 feet from any occupied residence not owned by the owner of the animal operation.

(4) The Director shall either approve or disapprove the best management plan submitted under this Paragraph within 90 days after receipt of the plan. If the Director disapproves the plan, he shall identify the plan=s deficiency.

History Note: *Authority G.S. 143-215.3(a)(1); 143-215.107(a)(11); 143-215.108(a);*
Temporary Adoption Eff. April 27, 1999; March 1, 1999;
Eff. July 1, 2000.

15A NCAC 02D .1803 BEST MANAGEMENT PLANS FOR ANIMAL OPERATIONS

(a) Contents of a best management plan. The best management plan for animal operations shall:

(1) identify the name, location, and owner of the animal operation;

(2) identify the name, title, address, and telephone number of the person filing the plan;

(3) identify the sources of odor within the animal operation;

(4) describe how odor will be controlled from:

(A) the animal houses;

(B) the animal wastewater lagoon, if used;

(C) the animal wastewater application lands, if used;

(D) waste conveyances and temporary accumulation points; and

(E) other possible sources of odor within the animal operation;

(5) contain a diagram showing all structures and lagoons at the animal operation, forced air directions, and approximate distances to structures or groups of structures within 3000 feet of the property line of the animal operation; a recent or updated aerial photograph may be submitted in place of a diagram provided the items required under this Subparagraph of this Rule are shown;

(6) for existing animal operations, contain a schedule not to exceed six months by which the plan will be implemented (a new animal operation is to have and be in compliance with its best management plan when it begins operation); for an amended best management plan, the implementation schedule shall not exceed six months;

(7) describe how the plan will be implemented, including training of personnel;

(8) describe inspection and maintenance procedures; and

(9) describe methods of monitoring and recordkeeping to verify compliance with the plan.

(b) The Division shall review all best management plan submittals within 30 days of receipt of the submittal to determine if the submittal is complete or incomplete for processing purposes. To be complete, the submittal shall contain all the elements listed in Paragraph (a) of this Rule. The Division shall notify the person submitting the plan by letter stating that:

(1) the submittal is complete,

(2) the submittal is incomplete and identifying the missing elements and a date by which the missing elements need to be submitted to the Division, or

(3) the best management plan is incomplete and requesting that the person rewrite and resubmit the plan.

(c) Approval of the best management plan. The Director shall approve the plan if he finds that:

(1) the plan contains all the required elements in Paragraph (a) of this Rule;

(2) the proposed schedule contained in the plan will reduce objectionable odors in a timely manner;

(3) the methods used to control objectionable odors are likely to prevent objectionable odors beyond the property lines of the animal operation (the Director shall not consider impacts of objectionable odors on neighboring property if the owner of the neighboring property agrees in writing that he does not object to objectionable odors on his property and this written statement is included with the proposed best management plan; this agreement becomes void if the neighboring property changes ownership. If the neighboring property changes ownership, the plan shall be revised, if necessary, to prevent objectionable odors on this property unless the new owner agrees in writing that he does not object to objectionable odors on his property); and

(4) the described compliance verification methods are sufficient to verify compliance with the plan.

Within 90 days after receipt of a plan, the Director shall determine whether the proposed plan meets the requirements of this Paragraph of this Rule. If the Director finds that the proposed plan does not meet the requirements of this Paragraph, he shall notify the owner or operator of the animal operation in writing of the deficiencies in the proposed plan. The owner or operator shall have 30 days after receiving written notification from the Director to correct the deficiencies. If the Director finds that the proposed plan is acceptable, he shall notify the owner or operator in writing that the proposed plan has been approved.

History Note: *Authority G.S. 143-215.3(a)(1); 143-215.65; 143-215.66; 143-215-215.107(a)(11);*
Temporary Adoption Eff. April 27, 1999; March 1, 1999;
Eff. July 1, 2000.

15A NCAC 02T .1304 STATE PERMITTING REQUIREMENTS

(a) This rule applies to animal waste management systems that meet the definition of an animal operation in G.S. 143-215.10B but are not subject to regulation under Rule .1305.

(b) An animal waste management plan shall be submitted as follows:

(1) The animal waste management practices or combination of practices which are selected to comprise a plan for a specific facility must meet NRCS standards, or the standard of practices adopted by the Soil and Water Conservation Commission pursuant to 15A NCAC 06F .0104, or standards for any combination of practices which provide water quality protection and are approved by one of these two agencies; and all applicable state statutes and rules at the time of development or design. NRCS

standards relating to phosphorus application rates for animal waste are not incorporated as part of this rule.

(2) As required by G.S. 143-215.10C, plans must be approved by a technical specialist and the certificate must be submitted to the Division on Division supplied forms or forms approved by the Division as providing the same information as required by the Division's forms. The technical specialist must certify that the best management practices that comprise the plan meet the applicable standards and specifications.

(3) The land application and siting setbacks must meet the applicable conditions established in G.S. 106-803 and NRCS standards at the time of construction.

(4) New and expanded animal waste treatment systems such as lagoons and waste storage structures shall be located at least 100 feet from a perennial stream or perennial waterbody. For new and expanding systems, this setback requirement shall also apply to areas in feedlots where an established vegetative cover will not be maintained because of the concentration of animals, with the exception of stock trails and stream crossings.

(5) The waste shall not be applied at greater than agronomic rates.

(6) For animal waste management facilities desiring to increase their animal population beyond that permitted, a new individual permit or new certificate of coverage to operate under a general permit must be issued before the additional animals are stocked.

(c) For each change of ownership of the system, the new owner must notify the Division in writing within 60 days of transfer of ownership.

(d) New and expanding swine facilities must demonstrate compliance with Rule .1307 of this Section prior to receiving a permit from the Division.

History Note: Authority G.S. 143-215.1; 143-215.3(a); 143-215.10A; 143-215.10I;

Eff. September 1, 2006;

Amended Eff. January 1, 2009.

15A NCAC 02T .1305 NPDES PERMITTING REQUIREMENTS

(a) This Rule applies to animal waste management systems subject to regulation under 40 CFR § 122.23 and G.S. 143-215.10C.

(b) With the exception of dry litter poultry systems, an animal waste management plan shall be submitted as follows:

(1) The animal waste management practices or combination of practices which are selected to comprise a plan for a specific facility must meet NRCS standards, or the standard of practices adopted by the Soil and Water Conservation Commission pursuant to 15A NCAC 06F .0104, or standards for any combination of practices which provide water quality protection and are approved by one of these two agencies; and all applicable state statutes and rules and all applicable federal requirements at the time of development or design.

(2) As required by G.S. 143-215.10C, plans must be approved by a technical specialist and the certificate must be submitted to the Division on Division supplied forms or forms approved by the Division as providing the same information as required by the Division's forms. The technical specialist must certify that the best management practices that comprise the plan meet the applicable standards and specifications.

(3) The land application and siting setbacks must meet the applicable conditions established in G.S. 106-803, NRCS standards and 40 CFR Part 412 at the time of construction.

(4) New and expanded animal waste treatment systems such as lagoons and waste storage structures shall be located at least 100 feet from a perennial stream or perennial waterbody. For new and expanding systems, this setback requirement shall also apply to areas in feedlots where an established vegetative cover will not be maintained because of the concentration of animals, with the exception of stock trails and stream crossings.

(5) The waste shall not be applied at greater than agronomic rates.

(6) For animal waste management facilities desiring to increase their animal population beyond that permitted, a new individual permit or new certificate of coverage to operate under a general permit must be issued before the additional animals are stocked.

(c) Dry litter poultry systems, for the purpose of this Rule and G.S. 143-215.10C, shall submit an animal waste management plan as follows:

(1) The animal waste management practices or combination of practices which are selected to comprise a plan for a specific facility must meet NRCS standards, or the standard of practices adopted by the Soil and Water Conservation Commission, or standards for any combination of practices which provide water quality protection and are approved by one of these two agencies; and all applicable state statutes and rules and all applicable federal requirements at the time of development or design.

(2) The land application and siting setbacks must meet the conditions established in NRCS standards and 40 CFR Part 412 at the time of construction.

(3) New and expanded animal waste structures such as houses and dry stacks shall be protected from the 100-year flood as determined by the Federal Emergency Management Agency.

(4) The waste shall not be applied at greater than agronomic rates.

(5) For animal waste management facilities desiring to increase their animal population beyond that permitted, a new individual permit or new certificate of coverage to operate under a general permit must be issued before the additional animals are stocked.

(d) For each change of ownership of the system, the new owner must notify the Division in writing within 60 days of transfer of ownership.

(e) Systems shall meet all applicable requirements of 40 CFR Part 122 and 40 CFR Part 412.

(f) New and expanding swine facilities must demonstrate compliance with Rule .1307 of this Section prior to receiving a permit from the Division.

History Note: Authority G.S. 143-215.1; 143-215.3(a); 143-215.10A; 143-215.10I;

Eff. September 1, 2006;

Amended Eff. January 1, 2009.

DIVISION OF WATER RESOURCES
STATE GENERAL PERMIT STAKEHOLDER MEETING

MINUTES

Date: August 22, 2013
Time: 10:00 AM
Location: DENR Training Room, Room 1210 Green Square Building, 217 W. Jones St., Raleigh

Moderator: Keith Larick, NC DWR

Handouts: Proposed Changes to the 2014 State General Permits
DRAFT Swine State General Permit
DRAFT Cattle State General Permit
Alternate Language for AWG200000 – Cattle State General Permit
DRAFT Poultry State General Permit

- Passed around sign-in sheet.
- Stakeholder Process Review – events leading up to stakeholder meeting today.
    - The current permits expire September 30, 2014.
    - The deadline to apply for renewal is approximately April 1, 2014 – 180 days prior to current permit expiration.
    - One additional stakeholder meeting is scheduled, if needed: August 29 at 10:00 in the same conference room.
    - After the stakeholder process, the permits will go through the public notice/hearing process
        - We will be reviewing our noticing process. Will reach out to extension service, conservation districts, and milk inspectors to get the word out.
        - Anne Coan noted that notices to dairies needs to be better.
    - Plan on at least 2 public hearings; Kenansville and Statesville in November or early December. We may add a third hearing if needed.
    - Hearing officers and the Division will consider comments, and prepare the final draft for the Director to sign.
    - The Division is looking to update the renewal process, internally.
        - Batch out renewals if possible to meet our permitting requirements.
            - This may be an issue for consultants in knowing when permits were sent out.
            - Perhaps look at processing up to “approval for COC” and then send out at once.
        - There is a push for E-Permitting and E-payments within DENR. Some other programs already use this.
            - DENR does have web-based, electronic payment available for funds transfers. Credit card payment will be available in the future.
            - We are looking at E-permitting as an option for folks – not a requirement.
            - Big issue is the requirement for WUP submission with renewal. We’ll look into possibility of not needing to submit if no changes have been made to WUP.
            - Is it okay to email WUP? Yes. We will work on issues of concern. Mainly file size and accessibility/security of information.

- Reviewed the Proposed Changes
    - There are not many proposed changes. There are general changes throughout the permits to update the name of the Division, the Director, etc. There are some changes for consistency in terminology.
    - Page 2 I.6 – Change to Director of the Division.
    - Page 4 II.10 – Correct the statute reference for mass mortality as noted in email from Dewitt Hardee. Perhaps we should also reference the mortality management memo.

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- Page 5 II.17 – Rule reference correction only.
- Page 6 II.24 – Clean up the calibration language.
- Page 8 III.4 – Changes soils sampling requirements to once every three years to comply with legislative change to the statute.
    - Dewitt Hardee let everyone know that the soils lab will be gated, and there will be no after-hours sample drop-off. Gate is currently under construction.
    - There will now be a fee for soil samples submitted during peak sampling season. Perhaps the Division will include a copy of the fee sheet with application packets.
- Page 8 III.5 – Modified waste sampling language to make more clear that the sample needs to represent the waste as it would be/was applied. i.e. if lagoon is agitated when waste is applied then the sample should be of the agitated waste, not the liquid waste prior to agitation.
- Page 9 III.11 – Deleted last phrase to eliminate the contradiction within the condition.
    - Anne Coan suggested deleting the phrase "a minimum of" from the record keeping requirements, stating that it implies records are required to be kept longer than the stated 3 years.
- Page 9 III.13 – This condition has not changed as much as it seems. The subparts of this condition were reorganized and some combined to make more clear and to make consistent with the NPDES General Permit.
    - Subpart f was added to this condition to address the current policy requiring Permittees to notify the Division if waste levels get up into the structural zone – 12 inches from top of dam.
    - Add clarification to definition of structural freeboard to the permit. See Condition V.2.
    - Also added paragraph to this condition that describe the requirement for a 5-day POA to be filed within 2 days of waste levels being in the structural zone.
    - Kathy Barker requested DWR to check with Division of Emergency Management regarding the 800 number reporting of emergencies after hours. Some people have had difficulty in filing the report with DEM.
    - Should we add language that state electronic notification is permissible?
- Page 11 III.14/15 – These conditions were combined to eliminate redundancy.
- Page 11 III.20 – This condition was a placeholder for the proposed monitoring rules that were under consideration when the last General Permits were drafted. This condition is no longer needed. Condition III.10 is standard language that allows the Division to require any monitoring that may become necessary.
- Page 12 V.2 – May need to add "or according to lagoon design" to the structural freeboard requirement.
- Page 13 V.4 – Addresses any potential misuse or misunderstanding of the intent of allowing 4 cubic yards of waste to be distributed for personal use. The change adds an overall limit of 10 cubic yards per year for distribution for personal use.
    - Anne Coan suggests breaking up the 4 yd/day and 10 yd/year into two sentences for clarity. She would also prefer to avoid "abuse" in describing this change.
- Page 13 V.12 – The language regarding compliance boundaries may change depending upon HB 74.
- Page 14 Agronomic Rate – Updated the reference to the current NRCS Standards. Standard 633 is no longer relevant to animal waste management.
- Suggestion to add "Division" to the list of Definition.
- Changes Specific to the Cattle Permit
    - All changes noted above are the same for Swine, Cattle, and Wet Poultry General Permits.
    - If House Bill 74 (HB 74) is signed in to law, the Alternate Language provided in the handouts will be used to replace Condition V.3 in the Cattle Permit only.
        - This change allows for permit rescission without closure of the waste impoundment for cattle operations that drop below the permitting threshold for three years or more.

- These farms would no longer meet the definition of animal operations according to the statute, can request rescission, and then be deemed permitted. This issue is unique to cattle/dairy operations.
- Should a facility decided later to go back above threshold and get permitted again, the facility would be considered a New Source and be required to meet all current standards.
- What about the 4 year rule? Can this be altered?

- The meeting was opened up to questions and comments.
  - The four year requirement for repopulation is an issue for many people.
    - There are depopulated farms that could potentially go back into operation except for the four year time limit to repopulate without upgrading to current NRCS standards.
    - Why should a facility that has maintained its permit be subject to this time restriction?
    - How many facilities does this currently impact?

Email/call with any questions/comments

Christine said that she would email out a track changes version of the draft permit to the group.

Next meeting is August 29th at 10:00 AM. Keith will notify everyone by Monday whether or not we will proceed with the meeting next Thursday.

State General Permit Stakeholder Meeting Agenda
10:00 AM; August 22, 2013
DENR Training Room – Room 1210
Green Square, 217 W. Jones St., Raleigh

Overview of Meeting & Introductions

Stakeholder Process

Timeline

Review of changes proposed by DWR

Initial Feedback and Suggestions

Q&A

2014 State General Permit Stakeholder Meeting - Sign-In Sheet

August 22, 2013, 10:00 am

Name	Email	Phone	Organization
Christine Lawson	christine.lawson@ncdenr.gov	919 807 6354	DENR – DWR
KEITH LARICK	keith.larick@ncdenr.gov	919 807 6444	DENR – DWR
Doug Atkins	datkins@murfam.com	271-0363	MFV
GLENN CLIFTON	glennc@prestagefarms.com	910-385-8317	PRESTAGE FARMS.
Tommy Stevens	kerrt@mac.com	919-219-8190	NCPC
Tom Ellis	tellis3@bellsouth.net	919-614-1765	NC Grange
KEVIN WESTON	kevinweston@murphybrownllc.com	910-293-5363	MURPHY-BROWN LLC
AJ Linton	alinton@murfam.com	910-271-0361	MFV
JR Joshi	Jaya.Joshi@ncdenr.gov	919-807-6341	DWR
Miressa Garoma	miressa.garoma@ncdenr.gov	919-807-6340	DWR
Dewitt Hendee	dewitt.hendee@ncda.gov	919-707-3069	NCDA&CS
Geno Kennedy	agriculturewriter@yahoo.com	910-289-0393	AST
Anne Coan	anne.coan@ncfb.org	919-788-1005	NC Farm Bureau Fed
Kathy Barker	kathybarker@embarqmail.com	910-624-6094	
Beth Buffington	beth.buffington@denr.gov	919-807-6334	DWR
Chester Lowder	chester.lowder@ncfb.org	9197881016	NCFB

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State General Permit Stakeholder Meeting Agenda
10:00 AM; August 29, 2013
DENR Training Room – Room 1210
Green Square, 217 W. Jones St., Raleigh

Review Permit Renewal / Stakeholder Process

Review Minutes of Previous Meeting

Discussion on changes since previous permit draft

Feedback and Suggestions

Q&A

2014 State General Permit Stakeholder Meeting - Sign-In Sheet

August 29, 2013, 10:00 am

	Name	Email	Phone	Organization
1	Christine Lawson	christine.lawson@ncdenr.gov	919 807 6354	DWR
2	Keith Larick	keith.larick@ncdenr.gov	919 807 6444	DWR
3	AJ Linton	alinton@murfam.com	910 285-1357	MFV
4	Amanda Hatcher	amanda_hatcher@ncsu.edu	910 2962143	NCCES
5	Matthew Starr	matthew@neuseriver.org	919 856-1180	Neuse Riverkeeper Foundation
6	Anne Coan	anne.coan@ncfb.org	919 788-1005	NC Farm Bureau Fed
7	Dewitt Hardee	dewitt.hardee@ncagr.gov	919-707-3069	NC DA & CS
8	Larry Baldwin	lbaldwin@waterkeeper.org	252-670-1413	Waterkeeper Alliance
9	Heather Ward	heatherward@waterkeepercarolina.org	252.904.1641	Waterkeeper Carolina
10	Miressa Garoma	miressa.garoma@ncdenr.gov	919-807-6340	DWR
11	Tommy Stevens	kerrt@mac.com	919-219-5120	NCPC
12	Beth Buffington	beth.buffington@ncdenr.gov	919-807-6334	DWR
13	Kathy Barker	kathybarker@embarqmail.com	910-624-6094	
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DIVISION OF WATER RESOURCES
STATE GENERAL PERMIT STAKEHOLDER MEETING

MINUTES

Date: August 29, 2013
Time: 10:00 AM
Location: DENR Training Room, Room 1210 Green Square Building, 217 W. Jones St., Raleigh

Moderator: Keith Larick, NC DWR

Handouts: Proposed Changes Summary
DRAFT Swine State General Permit
DRAFT Cattle State General Permit
DRAFT Poultry State General Permit

- Passed around sign-in sheet.
- Stakeholder Process Review – events leading up to stakeholder meeting today.
    - The current permits expire September 30, 2014.
    - The deadline to apply for renewal is approximately April 1, 2014 – 180 days prior to current permit expiration.
    - After the stakeholder process, the permits will go through the public notice/hearing process
        - We will be reviewing our noticing process. Will reach out to extension service, conservation districts, and milk inspectors to get the word out.
    - We will accept written comments during the stakeholder process. Please have all written comments submitted by **Friday, September 13**.
    - Plan on at least 2 public hearings; Kenansville and Statesville in November or early December. We may add a third hearing if needed.
    - Hearing officers and the Division will consider comments, and prepare the final draft for the Director to sign.
    - The goal is to have the final signed permit by the end of the year.

- Reviewed Minutes and the List of Proposed Changes
    - There are general changes throughout the permits to update the name of the Division, the Director, etc. There are some changes for consistency in terminology.
    - Page 2 I.6 – Change to Director of the Division.
    - Page 4 II.10 – Correct the statute reference for mass mortality.
        - Dewitt Hardee asked if we should also reference the mortality management memo, SART memo.
        - Keith Larick – we will look at the possibility. The SART memo was developed between DENR and NCDA&CS Vet Division to address issues of mass mortality such as was seen in Hurricane Floyd. There may be an issue with referencing a policy document in a permit.
    - Page 5 II.17 – Rule reference correction only.
    - Page 6 II.24 – Updated the calibration language.
    - Page 8 III.4 –Soils sampling requirements changed to once every three years to comply with statute change.
        - Why the change? What is the rationale for 3 years?
        - Keith Larick – We now have 15 plus years of soils data from these facilities, and it shows that the concentrations of nutrients/metals just don't change that much on an annual basis. The new sampling requirement follows the recommendations of NC State and the NRCS guidelines.
    - Page 8 III.5 – Added "representative" to make clear that the sample needs to represent the waste as it would be/was applied. i.e. If you are applying liquid, sample liquid. If you are applying sludge, then you need to sample sludge.

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- Page 9 III.11 – Cleaned up the wording to make it clear that records are to be kept for 3 years. This is not a change.
- Page 9 III.13 – Added notification subpart f to the permit language. This requires permittee to notify the Division if waste levels get up into the structural. This notification was already required, but is being added to the permit to be consistent.
  - The paragraph following the list of events requiring notification was amended to clarify the 30-day POA requirement for violation of waste capacity (item e)
  - Anne Coan suggested edits for consistent terminology.
- Page 10 III.14 – This condition combined two conditions in the previous permit that were redundant.
- Page 11 III.20 – This condition was a placeholder for the proposed monitoring rules that were under consideration when the last General Permits were drafted. This condition is no longer needed. Condition III.10 is standard language that allows the Division to require any monitoring that may become necessary.
- Page 13 V.4 – Four (4) cubic yards of waste to be distributed for personal use has been allowed, mainly used by dairies. The change adds an overall limit of 10 cubic yards per year for distribution for personal use to further clarify intent and eliminate misuse.
  - Anne Coan suggests breaking up the 4 yd/day and 10 yd/year into two sentences for clarity.
- Page 13 V.12 – We'd previously discussed the compliance boundary language and potential changes due to HB 74. We feel confident that there is no impact to this program.
  - Anne Coan – the current language seems in compliance with the new law.
- Page 13 Agronomic Rate – There is no change to the definition, simply updated the reference to the current NRCS Standards. Standard 633 is no longer relevant to animal waste management.
- Changes Specific to the Cattle Permit
  - With the signing of House Bill 74 (HB 74), we needed to change the permit condition that addresses the requirement for continued permitting. Previously, any animal facility that was permitted had to remain permitted until all waste structures were properly closed.
    - The sign of HB 74 into law allows for permit rescission without closure of the waste impoundment for cattle operations (only) that drop below the permitting threshold for three years or more.
    - These farms would no longer meet the definition of animal operations according to the statute, can request rescission, and then be deemed permitted. This issue is unique to cattle/dairy operations.
    - Should a facility decided later to go back above threshold and get permitted again, the facility would be considered a New Source and be required to meet all current standards.
    - The Division maintains the ability to deny a rescission request based upon compliance history.

- The meeting was opened up to questions and comments.
  - Heather Ward – With regard to the soil sampling requirement, how compliant were farmers on an annual basis?
    - Keith Larick – Very; probably 95%. Farmers were accustomed to it.
  - Heather Ward – How was soil sampling done? Do farmers have a consultant do the sampling?
    - Keith Larick – Some farmers hire consultants, but many will do for themselves.
  - Larry Baldwin – Is there a standard method?
    - Keith Larick – Yes, there is an extension publication that describes the method.
  - Heather Ward – for Regional Office Notification, farmers are required to call? What are the Regional Offices' ability to respond?
    - Keith Larick – There are seven regional offices. We are required to inspect all permitted facilities annually, so we are staffed to manage that plus complaints and

notifications. When we receive a complaint or notification from a permittee, we can typically get out to the site within 24 hours if it's needed.

- Matthew Starr – Do you see response changing with the restructuring of the Division?
  - It depends on what the cuts turn out to be, but we still doing all annual inspection as is our mandate.
  - We should still be able to maintain the level of service. We won't know what the Regional Offices will look like. There will be some budget cuts and some restructuring, but we will still meet permitting and compliance needs.
  - Questions specific to Washington Region – there are currently 3 full time DWR animal inspectors plus one person from Div. of Soil and Water who is responsible for Jones Co. They perform something like 500 inspections per year.
- Heather Ward – on page 2 I.5 – why does the language say "for facilities in watersheds sensitive to …"
  - Keith Larick – this condition addresses requirements for Phosphorous loss assessments (PLAT in NC). All NPDES facilities are required to run PLAT, but not so for facilities with the state general permit. This condition lets farmers know that while PLAT is not a requirement for all facilities, it may be required for some based on rules outside the animal waste program rules – like basin rules. So other rules may make PLAT a requirement.
  - Anne Coan – we may need to check with NRCS, as nationally they have gone to a 3 level designation for phosphorous loss assessment.
    - Keith Larick – yes, nationally they did, but NC is keeping the current Low, Medium, High, and Very High categories. It has been approved.
  - NRCS also requires that facilities receiving cost share must run PLAT. NRCS is also required to run PLAT for a facility if they prepare the waste plan.
- Anne Coan – the 4 year rule was brought up last time.
  - Keith Larick – the requirement that any facility that is depopulated for 4 years or more must come up to current NRCS standards before being restocked is actually in our rules. We cannot change this requirement in the Permit renewal. This rule goes back to the beginning of the animal program.
- E-permitting/E-payments
  - DENR is working on this across the board.
  - Owners can already pay permit fees online via bank transfer. Credit card payment is not yet available but coming. Credit card payment will have a fee associated with it to cover the cost of the credit card transaction.
  - DENR is working on making e-payment available for operators. Beth Buffington says that there is a slim chance of it being available for this year, but is likely for next year.
  - Keith Larick – other E-permitting issues for the animal program is the requirement that the WUP be submitted with the application. The statute clearly states that all applications including renewals require the WUP be submitted
    - Kathy Barker – can it be sent electronically?
    - Anne Coan – did you address the issue of file size limits?
    - Keith Larick – we will look into that. We are trying to create a single address that these items would be sent to. We have to work with our IT folks in it.
  - Keith Larick – we were asked about Regional Office notifications and can they be electronic. It's a good idea. We would also need to set up a specific email for that. And it would need an autoreply to acknowledge the notification. It would have to be something that someone is responsible to check daily. If we did this, we would put a custom email specific for the regional office for that facility on the COC. We would need to work out these details before we were to put e-notification in the actual permit.

- Please follow-up as you would like with any written comments by September 13. Feel free to give us a call if you need us.

- Christine will email out minutes to the list serve.

COMPONENTS OF AN ANIMAL WASTE MANAGEMENT PLAN[1]

I. General Information:
   A. Completed Certification Form
   B. Site Schematic

II. Site Evaluation and Site Investigation
   A. Existing Operations:
      1. Evaluate proximity of the waste storage facility to a 100-year floodplain
      2. Evaluate dam safety
      3. Evaluate proximity of wetlands to waste application area
   B. New or Expanding Operations:
      1. NRCS Site Evaluation Form NC-CPA-17 **(attached) or equivalent**
      2. Hazard Classification (NC-ENG-34) **(attached)**
      3. Site Map
         a) Location and elevation of borings and/or test pits in relation to established grid layout
         b) Borrow area located (if one is required)
         c) Soils map included
         d) Statement concerning observation of cultural resources (if applicable)
      4. Wetlands Determination

III. Design Survey (for New and Expanding facilities)
   A. Location and elevation of all buildings, pads, ponds, ditches, roads, utilities, fence lines, discharge pipes, wells, and any other structures that are in or near the design area.
   B. Location of property lines, perennial streams, wetland areas, and any other borders that lie close to and affect the design area.
   C. Topography of facility location.
   D. Areas where surface runoff is to be controlled, both polluted and non-polluted.
   E. Dimensions and elevations of existing facilities.
   F. Hazard classification data as needed.

IV. Facility Design
   A. Lagoon/Storage Facility Design
      1. Existing Operations:
         a) Show design needs (i.e., storage)
         b) Show measurements and calculated volumes
      2. New Construction:
         a) Show design needs (i.e., storage)
         b) Show construction inspection notes from NRCS standards to include liner inspection
         c) Consideration for emergency spillway
   B. Runoff control measures
      1. Waterways
      2. Diversions

[1] Additional items due to changes in NRCS Standards and regulations are indicated in bold.

3. Riparian buffers – see NRCS Filter Strip Standard 395
4. Filter Strips
5. Roof guttering
6. Others

C. Land Application System
1. Irrigation systems
   a) Parameters for existing equipment
   b) Designs for new systems
2. Tank spreaders
3. Box spreaders
4. Others

D. Operation and Maintenance Plan – include information about inspecting:
1. Pool Area – look for:
   a) Undesirable vegetative growth
   b) Floating or lodged debris
2. Embankment
   a) Settlement, cracking, or "jug" holes
   b) Side slope stability – slumps or bulges
   c) Wet or damp areas on the back slope
   d) Erosion due to lack of vegetation or wave action
   e) Rodent damage
3. Pipes
   a) Condition of pipes – look for:
      1) Separation of joints
      2) Cracks or breaks
      3) Accumulation of salts or minerals
   b) Extend out into the lagoon beyond the toe of the bank slope
   c) Be supported by piers, posts, or a cradle to prevent sagging
4. Vegetation – brush and trees on the embankment must be controlled by mowing, spraying, chopping, etc.
5. Pumps – check for proper operation of:
   a) Recycling pumps
   b) Irrigation pumps
6. Outside surface water diversions – inspect your diversion system for the following:
   a) Adequate vegetation
   b) Diversion capacity
   c) Ridge height

V. Waste Utilization Plan
A. Maps of fields to be used for waste application
B. Amount of manure produced/used annually
C. Waste application method
D. Dominant soil series by field for fields that will be used for waste application
E. Crops to be grown by field
F. Realistic yield expectations (R.Y.E.) of the crops to be grown where data is available

G. Nitrogen application rate by field based on R.Y.E. or recommendations from a land grant university if R.Y.E. data is not available. Also, a N balance which equals N applied minus R.Y.E. N rate (lbs/acre)
H. Waste application windows based on when the receiving crops are actively growing. Waste applications should be timed such that waste storage is not exceeded any time during the year.
I. NRCS irrigation parameters
J. Required specifications from NRCS Waste Utilization Plan Standard 633
K. Calibration information
L. Waste sampling for nutrient analysis within 60 days of land application
M. Annual soil sampling
    1. Lime requirement
    2. Measurement of Copper accumulation
    3. Measurement of Zinc accumulation

VI. Record Keeping
A. Required – in order to satisfy the Division of Water Quality's farm inspection procedures, the following items need to be available at the individual farm:
    1. Waste application records
    2. Map of farm fields including irrigation fields and acreage
    3. Certified Waste Management Plan (if applicable)
    4. Waste sample analysis or calculation of waste constituents
B. Recommended – it may be beneficial for you to maintain the additional following records for verification of Best Management Practices (BMPs):
    1. Daily farm rain records
    2. Weekly lagoon level (freeboard) records
    3. Soils analysis
    4. Animal population
    5. Crop yields

VII. Emergency Action Plan should include provisions for:
A. Description on how to stop the release of the waste
B. Description on how to assess the extent of the spill and note any obvious damages.
C. Phone numbers for contact at the appropriate agencies

VIII. Odor Control
A. Checklist of potential odor sources
B. Site-specific management practices to minimize odor sources

IX. Insect Control
A. Checklist of potential insect sources
B. Site-specific management practices to minimize insect problems

X. Provisions for Disposing of Mortalities

Animal Waste Management Plan Certification

(Please type or print all information that does not require a signature)

Existing or New or Expanded (please circle one)

General Information: **Permit No:** _____

Name of Farm:_____ Facility No: _____--_____

Owner(s) Name:_____ Phone No:_____

Mailing Address:_____

Farm Location: County Farm is located in:_____

Latitude and Longitude: ____ ____ ____ / ____ ____ ____ Integrator:_____

Please attach a copy of a county road map with location identified and describe below (Be specific: road names, directions, milepost, etc.): _____

_____

Operation Description:

Type of Swine	*No. of Animals*	*Type of Poultry*	*No. of Animals*	*Type of Dairy*	*No. of Animals*
o Wean to Feeder	_____	o Layer	_____	o Milking	_____
o Feeder to Finish	_____	o Non-Layer	_____	o Dry	_____
o Farrow to Wean	_____	*Type of Beef*	*No. of Animals*	o Heifers	_____
o Farrow to Feeder	_____	o Brood	_____	o Calves	_____
o Farrow to Finish	_____	o Feeders	_____		
o Gilts	_____	o Stockers	_____		
o Boars	_____	*Other Type of Livestock:*_____		*Number of Animals:*_____	

Expanding Operation Only

*Previous Design Capacity:*_____ *Additional Design Capacity:*_____ *Total Design Capacity:* _____

Acreage Available for Application:_____ Required Acreage:_____

Number of waste structures: _____ Total Capacity: _____Cubic Feet (ft^3)

Are subsurface drains present on the farm: **YES** or **NO** (please circle one)

If YES: are subsurface drains present in the area of the waste structures (please circle one or both as applicable)

****

Owner / Manager Agreement

I (we) verify that all the above information is correct and will be updated upon changing. I (we) understand the operation and maintenance procedures established in the approved animal waste management plan for the farm named above and will implement these procedures. I (we) know that any expansion to the existing design capacity of the waste treatment and storage system or construction of new facilities will require a permit application and a new certification to be submitted to the Division of Water Quality (DWQ) and permit approval received before the new animals are stocked. I (we) understand that there must be no discharge of animal waste from the storage system to surface waters of the state unless specifically allowed under a permit from DWQ and there must not be run-off from the application of animal waste. I (we) understand that run-off of pollutants from lounging and heavy use areas must be minimized using technical standards developed by the USDA-Natural Resources Conservation Service (NRCS). The approved plan will be filed at the farm and at the DWQ Regional Office and the office of the local Soil and Water Conservation District (SWCD). I (we) know that any modification must be approved by a technical specialist and submitted to the DWQ Regional Office and local SWCD and required approvals received from DWQ prior to implementation. A change in farm ownership requires a permit application to be sent to DWQ along with a new certification (if the approved plan is changed).

Name of Land Owner: _____

Signature:_____ **Date:**_____

Name of Manager (if different from owner)**:**_____

Signature:_____ **Date:**_____

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Technical Specialist Certification

I. As a technical specialist designated by the North Carolina Soil and Water Conservation Commission pursuant to 15A NCAC 6H .0104, I certify that the animal waste management system for the farm named above has an animal waste management plan that meets or exceeds standards and specifications of the Division of Water Quality as specified in 15A NCAC 2T .1300 (formerly 2H .0217) and the USDA-Natural Resources Conservation Service and/or the North Carolina Soil and Water Conservation Commission pursuant to 15A NCAC 2T .1300 (formerly 2H .0217) and 15A NCAC 6F .0101-.0105. The following elements are included in the plan as applicable. While each category designates a technical specialist who may sign each certification (SD, SI, WUP, RC, I), the technical specialist should only certify parts for which they are technically competent.

II. Certification of Design

A) Collection, Storage, Treatment System
Check the appropriate box

- o **Existing facility without retrofit (SD or WUP)**
  Storage volume is adequate for operation capacity; storage capability consistent with waste utilization requirements.

- o **New, expanded or retrofitted facility (SD)**
  Animal waste storage and treatment structures, such as but not limited to collection systems, lagoons and ponds, have been designed to meet or exceed the minimum standards and specifications.

Name of Technical Specialist (Please Print):_____

Affiliation_____Date Work Completed:_____

Address (Agency):_____Phone No.:_____

Signature:_____Date:_____

B) Land Application Site (WUP)
The plan provides for minimum separations (buffers); adequate amount of land for waste utilization; chosen crop is suitable for waste management; and the hydraulic and nutrient loading rates are appropriate for the site and receiving crop.

Name of Technical Specialist (Please Print):_____

Affiliation_____Date Work Completed:_____

Address (Agency):_____Phone No.:_____

Signature:_____Date:_____

C) Runoff Controls from Exterior Lots
Check the appropriate box

- o **Facility without exterior lots (SD or WUP or RC)**
  This facility does not contain any exterior lots.

- o **Facility with exterior lots (RC)**
  Methods to minimize the run off of pollutants from lounging and heavy use areas have been designed in accordance with technical standards developed by NRCS.

Name of Technical Specialist (Please Print):_____

Affiliation_____Date Work Completed:_____

Address (Agency):_____Phone No.:_____

Signature:_____Date:_____

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D). Application and Handling Equipment

Check the appropriate box

- o Existing or expanding facility with existing waste application equipment (WUP or I)
  Animal waste application equipment specified in the plan has been either field calibrated or evaluated in accordance with existing design charts and tables and is able to apply waste as necessary to accommodate the waste management plan: (existing application equipment can cover the area required by the plan at rates not to exceed either the specified hydraulic or nutrient loading rates, a schedule for timing of applications has been established; required buffers can be maintained and calibration and adjustment guidance are contained as part of the plan).

- o New, expanded, or existing facility without existing waste application equipment for spray irrigation. (I)
  Animal waste application equipment specified in the plan has been designed to apply waste as necessary to accommodate the waste management plan; (proposed application equipment can cover the area required by the plan at rates not to exceed either the specified hydraulic or nutrient loading rates; a schedule for timing of applications has been established; required buffers can be maintained; calibration and adjustment guidance are contained as part of the plan).

- o New, expanded, or existing facility without existing waste application equipment for land spreading not using spray irrigation. (WUP or I)
  Animal waste application equipment specified in the plan has been selected to apply waste as necessary to accommodate the waste management plan; (proposed application equipment can cover the area required by the plan at rates not to exceed either the specified hydraulic or nutrient loading rates; a schedule for timing of applications has been established; required buffers can be maintained; calibration and adjustment guidance are contained as part of the plan).

Name of Technical Specialist (Please Print):_____

Affiliation_____Date Work Completed:_____

Address (Agency):_____Phone No.:_____

Signature:_____Date:_____

E) Odor Control, Insect Control, Mortality Management and Emergency Action Plan (SD, SI, WUP, RC or I)

The waste management plan for this facility includes a Waste Management Odor Control Checklist, an Insect Control Checklist, a Mortality Management Checklist and an Emergency Action Plan. Sources of both odors and insects have been evaluated with respect to this site and Best Management Practices to Minimize Odors and Best Management Practices to Control Insects have been selected and included in the waste management plan. Both the Mortality Management Plan and the Emergency Action Plan are complete and can be implemented by this facility.

Name of Technical Specialist (Please Print):_____

Affiliation_____Date Work Completed:_____

Address (Agency):_____Phone No.:_____

Signature:_____Date:_____

F) Written Notice of New or Expanding Swine Farm

The following signature block is only to be used for new or expanding swine farms that begin construction after June 21, 1996. If the facility was built before June 21, 1996, when was it constructed or last expanded _____.

I (we) certify that I (we) have attempted to contact by certified mail all adjoining property owners and all property owners who own property located across a public road, street, or highway from this new or expanding swine farm. The notice was in compliance with the requirements of NCGS 106-805. A copy of the notice and a list of the property owners notified are attached.

Name of Land Owner:_____

Signature:_____ **Date:**_____

Name of Manager (if different from owner)**:**_____

Signature: _____**Date:**_____

III. Certification of Installation

A) Collection, Storage, Treatment Installation

New, expanded or retrofitted facility (SI)

Animal waste storage and treatment structures, such as but not limited to lagoons and ponds, have been installed in accordance with the approved plan to meet or exceed the minimum standards and specifications.

For existing facilities without retrofits, no certification is necessary.

Name of Technical Specialist (Please Print):_____

Affiliation_____Date Work Completed:_____

Address (Agency):_____Phone No.:_____

Signature:_____Date:_____

B) Land Application Site (WUP)

The cropping system is in place on all land as specified in the animal waste management plan.

Name of Technical Specialist (Please Print):_____

Affiliation_____Date Work Completed:_____

Address (Agency):_____Phone No.:_____

Signature:_____Date:_____

C) Runoff Controls from Exterior Lots (RC)

Facility with exterior lots

Methods to minimize the run off of pollutants from lounging and heavy use areas have been installed as specified in the plan.

For facilities without exterior lots, no certification is necessary.

Name of Technical Specialist (Please Print):_____

Affiliation_____Date Work Completed:_____

Address (Agency):_____Phone No.:_____

Signature:_____Date:_____

D) Application and Handling Equipment Installation (WUP or I)

- Animal waste application and handling equipment specified in the plan is on site and ready for use; calibration and adjustment materials have been provided to the owners and are contained as part of the plan.

- Animal waste application and handling equipment specified in the plan has not been installed but the owner has proposed leasing or third party application and has provided a signed contract; equipment specified in the contract agrees with the requirements of the plan; required buffers can be maintained; calibration and adjustment guidance have been provided to the owners and are contained as part of the plan.

Name of Technical Specialist (Please Print):_____

Affiliation_____Date Work Completed:_____

Address (Agency):_____Phone No.:_____

Signature:_____Date:_____

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E) <u>Odor Control, Insect Control and Mortality Management (SD, SI, WUP, RC or I)</u>

Methods to control odors and insects as specified in the Plan have been installed and are operational. The mortality management system as specified in the Plan has also been installed and is operational.

Name of Technical Specialist (Please Print):_____

Affiliation_____Date Work Completed:_____

Address (Agency):_____Phone No.:_____

Signature:_____Date:_____

Please return the completed form to the Division of Water Quality at the following address:

Department of Environment and Natural Resources
Division of Water Quality
Animal Feeding Operations Unit
1636 Mail Service Center
Raleigh, NC 27699-1636

Please also remember to submit a copy of this form along with the complete Animal Waste Management Plan to the DWQ Regional Office and the local Soil and Water Conservation District Office and to keep a copy in your files with your Animal Waste Management Plan.

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APPENDIX 11.1B

State of North Carolina
Department of Environment
and Natural Resources

James B. Hunt, Jr., Governor
Wayne McDevitt, Secretary
C.D. Malone, Vice Chairman

D E N R

Memorandum

To: Technical Assistance and Certification Unit
Water Pollution Control Systems Operator Certification Commission
Water Quality Regional Office Supervisors
Kim Colson
Jeff Poupart
Dennis Ramsey
Carroll Pierce
David Crouse
Karl Shaffer

From: Bo McMinn

Subject: Classification of Animal Waste Management Systems

Date: July 21, 1998

The applicability of G.S. §90A-47 to animal operations that do not involve the management of liquid residuals has been debated by affected individuals for several months. The law requires owners to designate an operator in responsible charge for each animal waste management system. Of specific uncertainty was whether or not the owner of an animal operation that has no liquid residuals is required to designate an operator in responsible charge. The Attorney General's office has advised that "animal operations not producing liquid residuals … are not required to designate a certified operator…." In addition, The Attorney General's office has advised that "systems utilizing only nonstructural practices (for the management of animal waste) are exempt from the requirement to have a certified operator".

Please disseminate this information to those individuals who you work with that may be affected by this decision. If you have any questions on this issue, or would like a copy of the Attorney General's advisory memorandum, please feel free to contact me at (919) 733-0026, ext 302.

Cc: Coleen Sullins
K. Tommy Stevens

Water Pollution Control System Operators Certification Commission
P.O. Box 29535, Raleigh, North Carolina 27626-0535 Telephone (919) 733-0026 FAX (919) 733-1338
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DSWC Copper and Zinc Projection Worksheet

Example

III. VOLUME TO BE REMOVED[1]: Date Measured: 7/18/01

Lagoon dimensions: Top - 480 x 86 ; Bottom - 468 x 74 ; Side slopes - 1 x 1

Liquid Depth: 1.5 ft (60,642 cubic feet x 7.48 gal/cu ft = 453,602 gallons)
Sludge Depth: 4.5 ft (166,941 cubic feet x 7.48 gal/cu ft = 1,248,719 gallons)
Total: 6.0 ft (227,583 cubic feet x 7.48 gal/cu ft = 1,702,321 gallons)

IV. WASTE ANALYSIS DATA: Date of Analysis: 7/31/01

A. – Nitrogen Concentration[2]:
Liquid: 5.9 lbs. PAN/1000 gal X liquid volume/1000 = 2,676 lbs. PAN
Sludge: 14.3 lbs. PAN/1000 gal X sludge volume/1000 = 17,857 lbs. PAN
Total PAN to be applied: 20,533 lbs PAN
divided by 1,702.32 Total Volume/1000
= 12.06 lbs PAN/1000 Mixed Volume Concentration
x 27.15 = 327.4 lbs per acre-inch

B. – Copper Concentration:
Liquid: 3.59 ppm X liquid volume = 1,628,431 ppm Cu – gallons
Sludge: 104 ppm X sludge volume = 129,860,776 ppm Cu – gallons
Total Copper to be applied = 131,489,207 ppm Cu – gallons
divided by 1,702,321 Total Volume
= 77 ppm Copper Mixed Volume Concentration

C. – Zinc Concentration:

Liquid: 8.24 ppm X liquid volume = 3,737,680 ppm Zn – gallons
Sludge: 174 ppm X sludge volume = 217,277,106 ppm Zn – gallons
Total Zinc to be applied = 221,014,786 ppm Zn – gallons
divided by 1,702,301 Total Volume
= 130 ppm Zinc Mixed Volume Concentration

[1] 1 cubic foot = 7.48 gallons
[2] 1 lb/1,000 gal = 27.15 lbs/ac-in

V. LAND APPLICATION OF WASTE – Lagoon # 1

Table A – Nitrogen

1	2	3	4	5	6	7	8	9	10	11
Field #	Crop	Soil Type	Realistic Yield Estimates	Nitrogen Lbs Per Acre Max.	Nitrogen Lbs Per Acre Planned	Usable Acres	Pan Amount Applied (lbs)	PAN Per Ac-In (from IV-A)	Ac-Ins Applied	Application Amount (Inches)
1	Corn	No	115	138	75	14.0	1050	327.4	3.21	0.23
2	Fes	Go	4	200	50	5.6	280	327.4	0.86	.15

Total PAN: _____

VI. SOIL TEST INFORMATION – Lagoon # 1:

Table B – Copper Levels

1	2	3	4	5	6	7	8
Date of Last Soil Test	Field #	Waste Cu Applied (ppm) (from IV – B)	Application Amount (Inches) (from V – A)	Conversion Factor[3]	Cu Index Adjustment	Soil Test Cu Index	New Soil Cu Index
1/1/01	1	77	0.23	6.297	111.5	45	156.5
1/1/01	2	77	0.15	6.297	72.7	32	104.7
				6.297			

Table C – Zinc Levels

1	2	3	4	5	6	7	8
Date of Last Soil Test	Field #	Waste Zn Applied (ppm) (from IV – C)	Application Amount (Inches) (from V – A)	Conversion Factor[4]	Zn Index Adjustment	Soil Test Zn Index	New Soil Zn Index
1/1/01	1	130	0.23	3.193	95.4	65	190.4
1/1/01	2	130	0.15	3.193	62.2	115	177.2
				3.193			

[3] Copper Index conversion factor = {(0.00835) * (27.15 thousand gals/ac-in)} / .036 = 6.297
[4] Zinc Index conversion factor = {(0.00835) * (27.15 thousand gals/ac-in)} / .071 = 3.193

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Department of Crop Science

NC STATE UNIVERSITY

College of Agriculture and Life Sciences
Campus Box 7620
Raleigh, NC 27695-7620

919.515.2647
919.515.7959 (fax)

Memorandum

TO: North Carolina Certified Technical Specialists

FROM: NC State University Forage Production Workgroup

DATE: July 13, 1998

SUBJECT: Crop Management Practices for Select Forages Used in Waste Management

The following is a four-page summary of suggestions for management practices for some forage crops that can be used in waste management plans. These suggestions are a result of discussions within the NC State University Forage Production Workgroup, a group comprised of NC State faculty and NRCS agency personnel with expertise with the crops.

There are limited documented research responses of some of these practices on the many soils and environments where these crops are currently being grown. The Forage Production Workgroup has taken the available data and used the combined experiences and realistic estimates of key people to come up with suggestions that will allow farmers to incorporate these crops and practices into waste management plans. As data become available to substantiate or refute these suggestions, the Forage Production Workgroup will make appropriate changes.

Bermuda Overseeded With Cereal Rye and Annual Ryegrass

Currently two types of "ryegrass" are being used for winter overseeding in fields used for animal waste management. Cereal rye is a winter annual smallgrain that looks similar to wheat, barley and oat. Annual ryegrass is a winter annual grass that looks much like tall fescue. Both of these grasses, when growing during the winter on bermuda sod, can have significant impact on subsequent bermuda yields. In effect, the total yields from an acre growing the combination of bermuda with these winter annuals will usually yield between 1-2 tons more per acre than bermuda growing alone for the year. Therefore, the total amount of PAN/acre for the year is about 100 lbs more than bermuda alone. Although cereal rye and annual ryegrass are suitable crops for overseeding, the management of the crops are different and thus practices implemented are dependent on the crop selection.

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919.515.7959 (fax)

Cereal Rye

The cereal rye should be planted by October 15 to provide the best opportunity to get winter growth. The most consistent stands are obtained from drilling rye into short (less than 3 inches tall) bermudagrass sod. If drilling is not possible, the seeds may be broadcast on short bermuda sod followed by a light cultivation with a disc or tillage implement. The seeding rate for broadcast planting of seeds should be 1.5 times the rate for drilled seeds. The last application of animal waste is to be applied to the bermuda prior to August 31. An application of 50 lbs/acre of Plant Available N (PAN) may be applied between September 15 and October 30. An additional 50 lbs/acre of PAN may be applied in February-March. If rye growth is harvested on time and does not significantly shade the bermuda, PAN rates for the subsequent bermuda crop are based on realistic yields of bermuda. A harvest is required prior to heading or April 7, which ever comes first. This is necessary to minimize the potential for shading bermuda and reducing its yields. The PAN rate for grazed systems with bermuda overseeded with cereal rye must be reduced in accordance with NRCS Technical Standard #590.

Annual Ryegrass

Annual ryegrass should be planted by October 15 to provide the best opportunity to get winter growth. The most consistent stands are obtained from drilling ryegrass into short (less than 3 inches tall) bermudagrass sod. If drilling is not possible, the seeds may be broadcast on short bermuda sod followed by a light cultivation with a disc or tillage implement. The seeding rate for broadcast planting of seeds should be 1.5 times the rate for drilled seeds. The last application of animal waste is to be applied to the bermuda prior to August 31. An application of 50 lbs/acre of (PAN) may be applied between September 15 and October 30. An additional 50 lbs/acre of PAN may be applied in February-March. If additional PAN is applied to the ryegrass in April-May, the PAN rate for the bermuda must be reduced by a corresponding amount. This is necessary because ryegrass growth during April-May will reduce bermuda yields and shorten the time bermuda can fully utilize the N. A harvest is required by heading or April 7, which ever comes first to prevent shading of emerging bermuda during April-May period. To favor the production of the bermuda, additional harvests of ryegrass will be required when the ryegrass canopy reaches 12 to 15 inches height. The PAN rate for grazed systems with bermuda overseeded with annual ryegrass must be reduced in accordance with NRCS Technical Standard #590.

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Eastern Gamagrass

Limited data are available on the response of gamagrass to various levels of N and soil types in North Carolina. However, until further data is collected, the following guidelines may be used.

1. On sandy textured soils that are well drain or excessively well drained, gamagrass may yield similar to hybrid bermudagrass at similar PAN rates.

2. On heavy textured soils that are poorly to somewhat poorly drained, gamagrass may yield 1.5-3 times more than hybrid bermuda

Garnagrass establishes slowly and will not usually produce much harvestable forage during the establishment year. It is best to allow the growth during the seedling year to accumulate for most or all season; if it is to be harvested, it should be done after full seedhead formation on a majority of the plants. Therefore, PAN for the seedling year should be modified accordingly. Overseeding gamagrass with winter annuals is not currently advised because the harvesting or grazing management of the winter annual crops during February-April would be detrimental to the survival of gamagrass. Gamagrass should not normally be harvested or grazed below 6-8 inches stubble.

Application rates are to be based on the realistic N rates that address the N needs per ton of hay, a realistic yield and an appropriate application window. When harvested as hay in the 24-36 inch stage of growth, the N rate ranges from 40-50 lbs/ton of dry matter. The PAN rate for grazed systems must be reduced in accordance with NRCS Technical Standard #590.

The application window for gamagrass is slightly earlier than for bermuda; gamagrass starts growing about 3-4 weeks earlier than Coastal bermudagrass and about 2-3 weeks earlier than Tifton 44. Gamagrass is dormant from frost to March. The last application of PAN in the summer should be prior to August 31.

Rescuegrass (i.e. Matua)

Rescuegrass is a cool season grass and makes most of its growth from March-June and September-November. It should receive most of its N during the September-October and late February through May months. Limited data are available for realistic yields of rescuegrass on various soils and at various N levels in North Carolina. However, until further data is collected the following suggestions may be useful

1. On sandy, well drained to excessively drained soils, rescuegrass may yield 1.5- 3 times fescue, assuming a uniform and dense stand of grass is present.

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2. On wet or poorly drained soils, rescuegrass may yield .75 -1.0 times as much as fescue.

3. On soils where both are well adapted the yields of rescuegrass may be 1-1.5 times more than fescue,

The above RYE estimates assume that stand density is maintained through natural reseeding every year. Although rescuegrass is a "perennial" it does not maintain dense, satisfactory stands unless it is allowed to reseed every year. Even under this management it is likely that disease will affect one or more growths in some years.

Application rates are to be based on the realistic N rates that address the N needs per ton of hay, a realistic yield and an appropriate application window. When harvested as hay, the N rate is similar to other cool season grasses such as fescue, ranging from 40-50 lbs/ton. Rescuegrass may also continue some growth in June-August if moisture is available. During these off-seasons, rescuegrass should not receive more than about 25 lbs N/acre/month. Only apply 25 lbs N/acre in June-August if the equivalent of 1-inch of water can be applied at the same time. If the crop does not respond with at least a 1000 lbs of growth within a 3-5 week period do not make another application until the plants have had the opportunity to use the previous application.

SoilFacts

Use of On-Farm Records for Modifying a Certified Animal Waste Management Plan

Background

Every animal operation in North Carolina of a certain size now must have a certified animal waste management plan, as mandated by state environmental regulations. Affected are all farms with 250 or more swine, 100 or more confined cattle, 75 or more horses, and/or 1,000 or more sheep, but only poultry enterprises of 30,000 or more birds that use a liquid waste system.

A key component of this overall certified animal waste management plan is a waste utilization program. Based on the volume of waste produced, on the nutrient concentration in the waste, and on the nutrient requirements of the receiving crop, the certified management plan will define the number of acres and types of crops to be grown on the farm and will help determine the environmentally sound cropping systems that are ultimately used for land application of the manure nutrients.

Currently, the certified waste management plan must meet the technical standards of the Natural Resources Conservation Service (NRCS), some of which are shown in Tables 1 and 2. Using those standards as guidance, the animal waste management plan estimates the amount of waste generated and, subsequently, the total amount of plant-available nutrients. For illustration purposes, this publication will use swine farm examples, although the process is valid on any farm with a liquid waste management system.

Total PAN estimates from state averages

NRCS standards provide waste generation rates for various production units based on statewide averages (Table 1). Using average production unit values and the average nutrient concentration (Table 2), total plant-available nitrogen (PAN) can be estimated, provided the number of animals to be raised is known.

Table 1. Average animal waste generation values for different swine production units

Production unit	Animal unit	Lagoon liquid[1]	Slurry[2]
		Gallons per animal unit per year	
Weanling-to-feeder	per head	191	152
Feeder-to-finish	per head	927	751
Farrow-to-weanling	per active sow	3,203	2,638
Farrow-to-feeder	per active sow	3,861	3,180
Farrow-to-finish	per active sow	10,481	8,634

[1]Estimated total lagoon liquid includes total liquid waste plus average annual rainfall surplus falling on lagoon.
[2]Six-month accumulation of waste, urine, and excess water usage; does not include fresh water for flushing or lot runoff.

Table 2. Nitrogen composition of swine manure

Waste type	Total N	PAN irrigated	PAN injected
	lb/1,000 gal		
Liquid slurry	31	9.3	24.8
Anaerobic lagoon liquid	5	2.5	4.5
Anaerobic lagoon sludge	22	8.8	13.2

Source: Abridged from *North Carolina Agricultural Chemicals Manual*

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Example A

A new farrow-to-finish operation for 5,000 sows is planned. Because it is a new farm with no on-farm waste management records, state averages found in NRCS technical standards must be used in preparing the certified animal waste management plan. A key question is: *How much lagoon liquid will be generated and land-applied each year?* To answer this question, use the following formula and Table 1:

$$\frac{\text{Volume of wastewater generated}}{\text{year}} = \frac{\text{Number of animals}}{\text{year}} \times \frac{\text{Gal of wastewater}}{\text{animal}}$$

$$\frac{\text{Volume of wastewater generated}}{\text{year}} = \frac{\text{5,000 sows}}{\text{year}} \times \frac{\text{10,481 gal}}{\text{sow}}$$

Volume of wastewater generated = 52,405,000 gal per year

The farmer relies on an anaerobic lagoon and expects to use an irrigation system to land-apply the lagoon liquid. Now the question is: *How many pounds of total PAN will be generated and land-applied each year?* To answer this question, use the formula below, plus Table 2 and the result from the previous calculation:

$$\frac{\text{Total lb PAN}}{\text{year}} = \frac{\text{Volume of wastewater generated}}{\text{year}} \times \frac{\text{lb PAN}}{\text{1,000 gal}}$$

$$\frac{\text{Total lb PAN}}{\text{year}} = \frac{\text{52,405,000 gal}}{\text{year}} \times \frac{\text{2.5 lb PAN}}{\text{1,000 gal}}$$

Total lb PAN = 131,012.5

Factors such as age and class of animal, genetics and diet, lagoon size, and solids removal may cause each facility to deviate from the NRCS averages shown in Tables 1 and 2. Management of individual farms may be improved by using site-specific data, as will be shown in the following section. For additional examples and a more detailed discussion of factors affecting plant-available nitrogen, refer to Chapter 3 of the manual on *Certification Training for Operators of Animal Waste Management Systems.*

Total PAN estimates from on-farm data

Under specific conditions, estimates of the total pounds of PAN generated may be more accurate if farm records can be used in lieu of NRCS standards. However, to accurately calculate a facility's PAN production, waste analysis data ***and*** actual volumes applied over an **extended** period (*i.e.*, at least 3 years) must be collected.

To insure reliable data, use the following guidelines to calculate total pounds of PAN:

1. Use 3 years of records for both nutrient concentrations and annual liquid volumes to determine farm averages. For lagoon-based waste management systems, collect at least three samples annually with seasonal variation for nutrient analysis. For systems using waste storage ponds, collect at least two samples annually with seasonal variation for nutrient analysis. Follow recommended sampling procedures. A description of these sampling procedures may be found in *SoilFacts: Waste Analysis.*
2. The samples should be analyzed by either the North Carolina Department of Agriculture and Consumer Services Agronomic Division or a reputable private laboratory. All the analyses must be used to compute the average N (nitrogen) concentration. The analyses also should be included as an appendix in the revised certified animal waste management plan.
3. Records of annual lagoon liquid volumes applied may be obtained from standard land application records (*e.g.*, NRCS Form IRR-2). Volume data must be used from the years corresponding to the waste analysis records. The volume data should be included as an appendix to the revised certified animal waste management plan.
4. Do not use extreme sample analysis values to determine the averages. The NRCS standards database, based on 1,403 data points, shows that one statistical standard deviation represents a 48 percent deviation from the mean for swine lagoon liquid N. Therefore, any value used to calculate the 3-year average N concentration that lies outside the mean plus or minus 48 percent should not be used to calculate the farm average. For calculating the average, at least two-thirds of the samples must be within 48 percent of the average, including at least one sample per 12-month period.

To calculate the average N concentration, all sample values must be considered. First, average all values. Next, exclude any values that are more or less than 48 percent of the average. Then calculate the average using the remaining values. Multiply this second average by the average annual volume to determine the facilities' PAN production, based on actual site-specific data.

Table 3. Cumulative wastewater application, 1996–98

Field	Yearly gallons applied		
	1998	1997	1996
1	8,095,000	5,106,000	8,661,000
2	3,885,000	3,234,000	7,266,000
3	3,495,000	3,920,470	2,160,000
4	6,204,000	4,005,000	1,686,000
5	300,000	273,600	386,400
6	101,280	381,960	164,160
7	1,287,000	1,009,500	1,815,000
8	1,179,000	963,000	1,788,000
9	310,080	297,600	458,400
10	805,920	645,120	994,560
11	851,040	742,080	1,189,800
12	223,680	568,470	831,720
13	3,505,500	3,606,000	4,221,000
14	12,421,500	10,175,100	13,655,000
15	12,729,000	10,969,200	13,068,000
16	582,000	614,400	591,840
17	1,178,640	927,120	919,680
18	2,169,300	4,896,000	3,030,000
19	4,248,000	4,341,000	3,537,000
Total	*63,570,940*	*56,675,620*	*66,423,560*
Average annual volume applied			***62,223,373***

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Example B

Consider the same farm described above, a farrow-to-finish operation with 5,000 sows, only this time the farm has sufficient on-farm records. A quick review of the farm records indicates there are 19 fields in the land-application program and complete irrigation records for 1998, 1997, and 1996.

Using actual data from the farm, on average, how much lagoon liquid will be generated and land-applied each year?

To answer this question, first determine the volume of lagoon liquid applied each year (Table 3). Add the values for each year to calculate the total volume of wastewater irrigated annually:

63,570,940 gallons in 1998.

56,675,620 gallons in 1997.

66,423,560 gallons in 1996.

The 3-year average is 62,223,373 gallons. In this case, the farmer's records indicate he is land-applying more wastewater than would have been estimated using NRCS technical standards. However, whether the farmer is applying more nitrogen depends on the nitrogen concentration of the wastewater. To determine the total pounds of PAN being applied, we need to consider the PAN concentration in the lagoons on the farm.

A further review of farm records indicates that 5 lagoons are actively used in the waste management system. For each lagoon, there are 3 years of waste analysis records, which have been summarized in Table 4.

As indicated in guideline 4 above, do not use extreme sample analysis values to determine the averages. To determine which values ultimately to use, estimate one standard average. Based on the thousands of samples compiled in developing the NRCS database, one standard deviation would be approximately 48 percent of the average PAN. This can be calculated using the following equation:

Standard deviation for waste analyses = 0.48 x average PAN

Standard deviation for waste analyses = 0.48 x 2.52 lb/1,000 gal

Standard deviation for waste analyses = 1.21 lb/1,000 gal

Using the newly figured standard deviation of 1.21 pounds per 1,000 gallons, calculate the range of waste values to include in the final average:

Range of values to include in average = Average of waste analyses ± Standard deviation

Range of values to include in average = 2.52 ± 1.21

Range of values to include in average = 1.31 to 3.73 lb/1,000 gal

Using the data from Table 4, calculate the second on-farm average by omitting the values that fall outside the range of 1.31 to 3.73 pounds per 1,000 gallons:

Table 4. Summary of waste analysis records for 5 anaerobic lagoons, 1996–98

	Lagoon 1		Lagoon 2		Lagoon 3		Lagoon 4		Lagoon 5	
Month	Year	PAN[1]	Year	PAN[1]	Year	PAN[1]	Year	PAN[1]	Year	PAN[1]
March	1998	3.80	1998	2.42	1998	2.07	1998	2.57	1998	2.21
June	1998	2.37	1998	2.03	1998	5.68	1998	2.23	1998	1.24
September	1998	2.55	1998	3.23	1998	2.47	1998	3.98	1998	2.55
April	1997	2.64	1997	2.69	1997	2.66	1997	2.41	1997	2.16
June	1997	2.67	1997	0.24	1997	2.60	1997	2.62	1997	2.16
September	1997	2.47	1997	2.34	1997	2.34	1997	2.68	1997	2.64
April	1996	3.61	1996	3.25	1996	3.15	1996	2.91	1996	1.09
September	1996	2.05	1996	2.12	1996	1.94	1996	2.15	1996	1.89
Average by lagoon		2.77		2.29		2.86		2.69		1.99
Farm Average	***2.52 pounds per 1,000 gallons***									

[1]Plant-available N from waste analysis report, in pounds per 1,000 gallons

Table 5. Revised summary of waste analysis records for 5 anaerobic lagoons, 1996–98

	Lagoon 1		Lagoon 2		Lagoon 3		Lagoon 4		Lagoon 5	
Month	Year	PAN[1]	Year	PAN[1]	Year	PAN[1]	Year	PAN[1]	Year	PAN[1]
March	1998		1998	2.42	1998	2.07	1998	2.57	1998	2.21
June	1998	2.37	1998	2.03	1998		1998	2.23	1998	
September	1998	2.55	1998	3.23	1998	2.47	1998		1998	2.55
April	1997	2.64	1997	2.69	1997	2.66	1997	2.41	1997	2.16
June	1997	2.67	1997		1997	2.60	1997	2.62	1997	2.16
September	1997	2.47	1997	2.34	1997	2.34	1997	2.68	1997	2.64
April	1996	3.61	1996	3.25	1996	3.15	1996	2.91	1996	
September	1996	2.05	1996	2.12	1996	1.94	1996	2.15	1996	1.89
Average by lagoon		2.62		2.58		2.46		2.51		2.27
Farm Average	***2.49 pounds per 1,000 gallons***									

[1]Plant-available N from waste analysis report, in pounds per 1,000 gallons

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Multiply the second average by the average annual volume of wastewater applied (Table 3) to determine the facilities' PAN production.

$$\frac{\text{Total lb PAN}}{\text{year}} = \frac{\text{Volume of wastewater generated}}{\text{year}} \times \frac{\text{lb PAN}}{\text{1,000 gal}}$$

$$\frac{\text{Total lb PAN}}{\text{year}} = \frac{\text{62,223,373 gal}}{\text{year}} \times \frac{\text{2.49 lb PAN}}{\text{1,000 gal}}$$

$$\frac{\text{Total lb PAN}}{\text{year}} = 154{,}936$$

Summary

The use of on-farm records can work to an animal producer's benefit by providing more site-specific information about how an animal waste management system should be operated, particularly with respect to the number of acres of crops necessary to properly utilize the nutrients (mainly nitrogen) in the wastewater. Historically, waste management plans have been developed based on the state averages used in the NRCS technical standards. Although the standards are an excellent beginning for farms without waste management records, existing farms with records should incorporate their site-specific data into further refined waste management plans.

However, on-farm records should be used only if complete. For example, PAN concentrations in wastewater provide little insight into the total pounds of PAN to be applied without knowledge of how many gallons of wastewater are to be applied. Likewise, situations may exist in which a farmer applies more wastewater than expected, yet that wastewater has a lower PAN concentration than expected so overall the farmer applies fewer total pounds of PAN.

Ultimately, using comprehensive on-farm wastewater records can improve the management of the land-application program, as long as the records are used appropriately.

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Prepared by

David A. Crouse, Assistant Professor and Extension Specialist, Department of Soil Science, North Carolina State University

James C. Barker, Professor and Extension Specialist, Department of Biological and Agricultural Engineering, North Carolina State University

John L. Havlin, Professor and Head, Department of Soil Science, North Carolina State University

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Guidelines for Using Plant Tissue Analysis to Justify Additional Waste Applications and/or Extending Application Windows

These suggestions for supplemental applications of RYE-based, plant-available nitrogen (PAN) rates (over and above certified animal waste management plan limits) are based on practical experience with diagnostic field interpretations of NCDA&CS plant tissue analysis index values.

When nitrogen deficiency is suspected in a receiving crop, plant tissue analysis is an essential diagnostic tool. To use a plant analysis report to support recommendations for the application of PAN to a crop receiving livestock waste in NC, the sample should be collected 1) at the proper growth stage for accurate analysis, and 2) past or approaching the maximum allowed PAN application.

➢ How to collect the proper tissue sample

[see also www.ncagr.com/agronomi/pictorial.htm]

Crop & Stage of Growth*	What to Sample (plant size)	Size of Sample
coastal bermuda (vegetative stage)	upper portion of plant	10–15 handfuls
corn, grain (seedlings < 12 in tall)	entire above-ground plant	20–30 stalks
corn, grain (plants > 12 in tall)	1st fully developed leaf below whorl	10–15 leaves
soybean (seedlings)	entire above-ground plant	20–30 plants
soybean (prior to bloom)	1st fully developed trifoliate below tip	20 leaves

* Plant tissue nutrient concentrations change with the growth stage of the crop. This requires that specific plant tissue samples be collected at the specific stages of growth for which sufficiency ranges have been developed.

➢ How to adjust waste application based on tissue sample results

For the major annual row crops corn, soybeans, and small grains, advisors should utilize growth stage/N uptake curves in figures 1, 2, and 3, to estimate the amount of additional PAN that should be applied. A correct determination of stage of growth is essential for using these curves. Advisors may refer to tables 1, 2, and 3 for assistance in determining stage of growth. When growth stage is ascertained, the portion of plant N that would likely be taken up (from that point until the crop reaches physiological maturity) can be estimated. That percentage may then be applied to the PAN rate given for the crop and field(s) in the WUP.

It will also be necessary for the advisor to estimate the date by which the additional PAN must be applied (estimated maturity of the crop) if the normal application window ends prior to the application of needed supplemental PAN. The uptake curves and growth stage tables may be utilized for this. However, because the rate of crop maturity may vary from that projected by the curves, a conservative estimate is advisable.

Please note that soybeans, as normally grown, can obtain all required nitrogen through biological fixation, and, therefore, will rarely be deficient in nitrogen.

Suggested method for estimating supplemental PAN:

1) Determine the current growth stage of the crop (see descriptions).
2) Plot the corresponding point on the N line. This reflects the portion of the crop's N that should have been taken up by that stage of development.
3) Multiply the RYE based PAN rate assigned to the crop and field by the difference [(100 - % of total N) * assigned PAN rate]. This is the suggested rate of PAN supplementation.
4) The application window for supplemental PAN remains as assigned in the WUP for crops planted on time. For crops planted late, an extension of the application window may be justified in conjunction with supplemental PAN based on plant analysis. For late-planted crops where N is found to be sufficient, an extension of the application window may be made, but applied PAN may not exceed limits given in the WUP.

Example: A farm applying waste effluent to corn grown on a Norfolk loamy sand soil has applied most of the allowed PAN prior to a period of excessive (leaching) rainfall occurring between the V6 and V14 growth stages. The farm has completed applying all allowed PAN by the time the crop has reached the V16 growth stage. A tissue sample (ear leaves) is collected at tasseling (stage V18 to R1) by an authorized advisor (RA or CCA).

The plant report shows a tissue N index of 42, suggesting that the crop could take up and utilize additional N. A current growth stage determination is promptly made, indicating the crop is approximately R2 stage. Using the uptake curve, it is determined that corn normally takes up about 20 to 25% of its total N between R2 and physiological maturity, which, in this example, roughly translates into 25 to 35 lbs/ac PAN. The advisor must then estimate the time frame until the crop will reach R5, the stage at which little, if any, N will be taken up.

The example presumes that, due to the high rainfall, the farm has a good stand of corn with high yield potential. The advisor therefore may opt for a PAN rate from the higher end of the range. In this example, the advisor authorizes the operator to immediately begin applying waste not to exceed 35 lbs/ac PAN based on the most recent valid waste analysis. If the operator does not have a waste analysis taken within the past 60 days, a sample should be submitted promptly and its reported PAN used to calculate the allowable application quantity. The advisor also sets an application window, 18 days in this example, and instructs the operator not to apply beyond a designated calendar date.

The advisor would then send the written recommendation, stating the basis upon which it was formulated, to the farm's technical specialist along with a request to prepare a conditional amendment for the farm's WUP. If the advisor is also a certified technical specialist, he/she may prepare the amendment containing the recommendation and its

basis. Copies of the amendment should be sent to the county NRCS office, and to appropriate DENR staff, if involved in the situation. The operator should keep a copy of the PA report along with the recommendations and amendment in the farm's records.

For other crops, use the suggested supplementation below. Remember that forage grasses need to be actively growing to take up nitrogen. Grasses must be in vegetative stage for valid sampling. Grasses with rank or mature growth should be harvested prior to receiving supplemental PAN. The potential for vigorous growth is essential, especially when application windows might also be extended.

Plant Tissue Interpretation Index	% RYE-based PAN to Supplement
> 50 (sufficient)	none
45–50 (marginally low)	5–10%
35–44 (moderately low)	10–20%
25–34 (low)	20–30%
< 25 (deficient)	30–35%

Consider the following factors when making supplemental applications.

1) Waterlogged soils may limit root development.
2) More poorly drained soils that are saturated for prolonged periods may lose nitrogen due to denitrification.
3) If other nutritional factors are involved, such as low soil pH, magnesium deficiency, low sulfur, and/or low potassium, then apply corrective fertilizer as soon as possible and limit PAN applications as shown above.

Compiled by NCDA&CS Agronomic Division, June 19, 2003
Revised August 14, 2006

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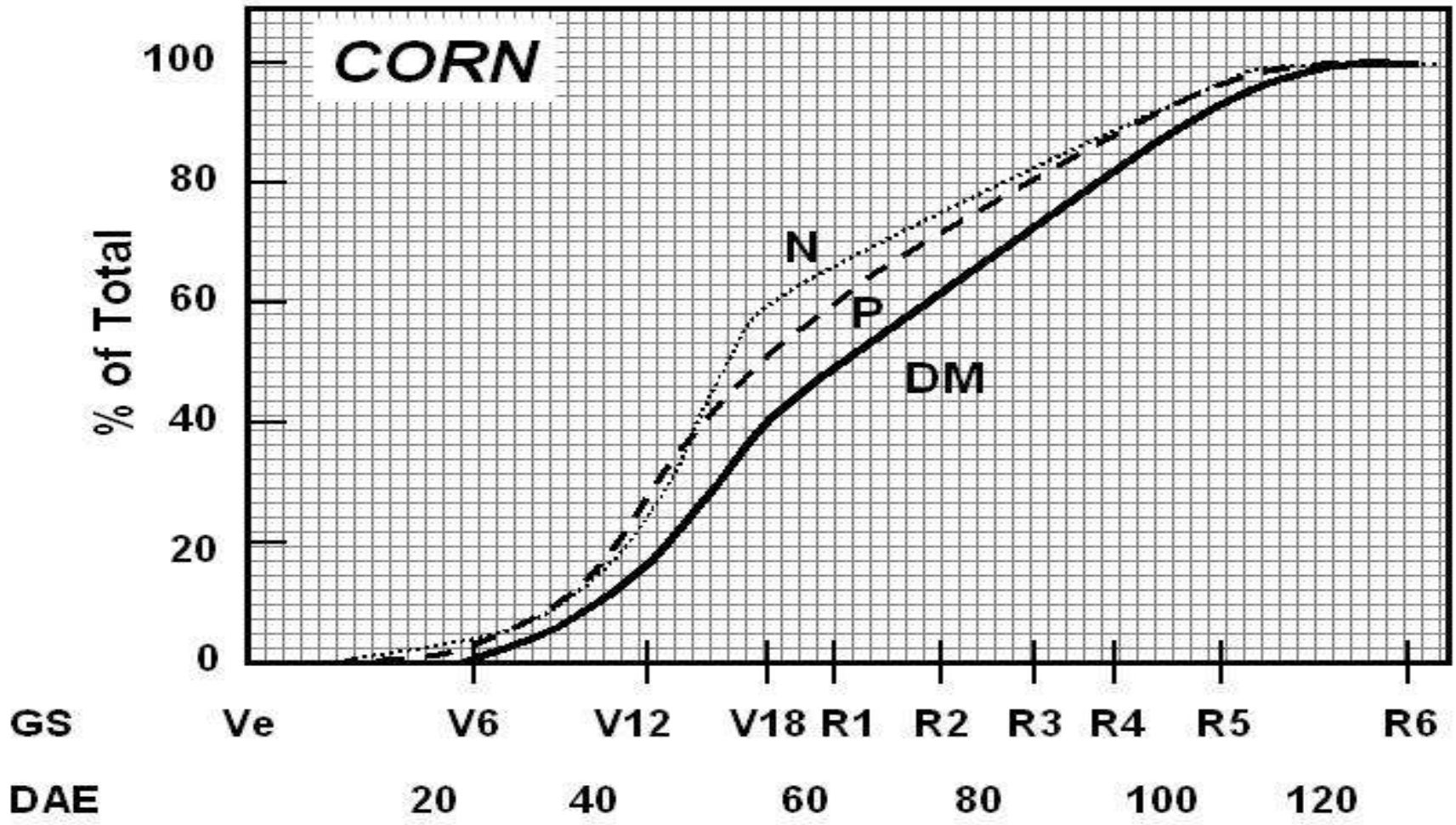
Figure 1. Growth Stage and Nitrogen Uptake Curves for Corn



S.W. Ritchie, J.J. Hanway, and G.O. Benson. 1986. How a Corn Plant Develops, Spec. Rep. #48, Iowa State Univ. Coop. Ext.

Table 1. Vegetative and Reproductive Stages of a Corn Plant

Vegetative Stages	Reproductive Stages
VE - emergence V1 - first leaf with collar visible V2 - two leaves with collar visible V3 - three leaves with collar visible V6 - four leaves with collar visible V9 - five leaves with collar visible V12 - twelve leaves with collar visible V15 - fifteen leaves with collar visible V18 - eighteen leaves with collar visible VT - last branch of tassel is completely visible	R1 - Silking: silks visible outside the husks R2 - Blister: kernels are white and resemble a blister in shape (10 to 14 days after silking) R3 - Milk: kernels are yellow on the outside with a milky inner fluid (18 to 22 days after silking) R4 - Dough: milky inner fluid thickens to a pasty consistency (24 to 28 days after silking) R5 - Dent: nearly all kernels are denting (35 to 42 days after silking) R6 - Physiological Maturity: the black abscission layer has formed (50+ days after silking)

Drawing 1. Corn Growth Stages

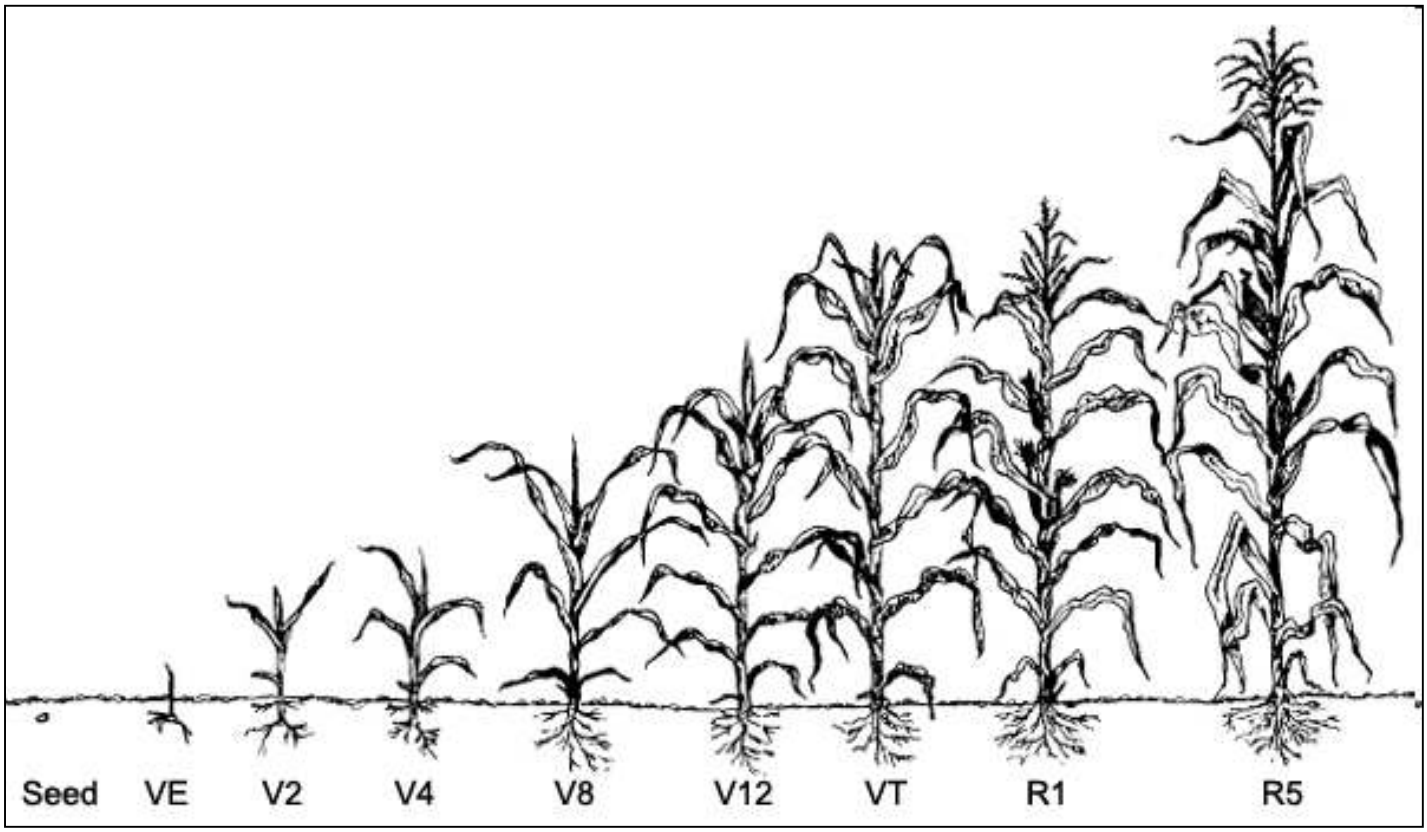
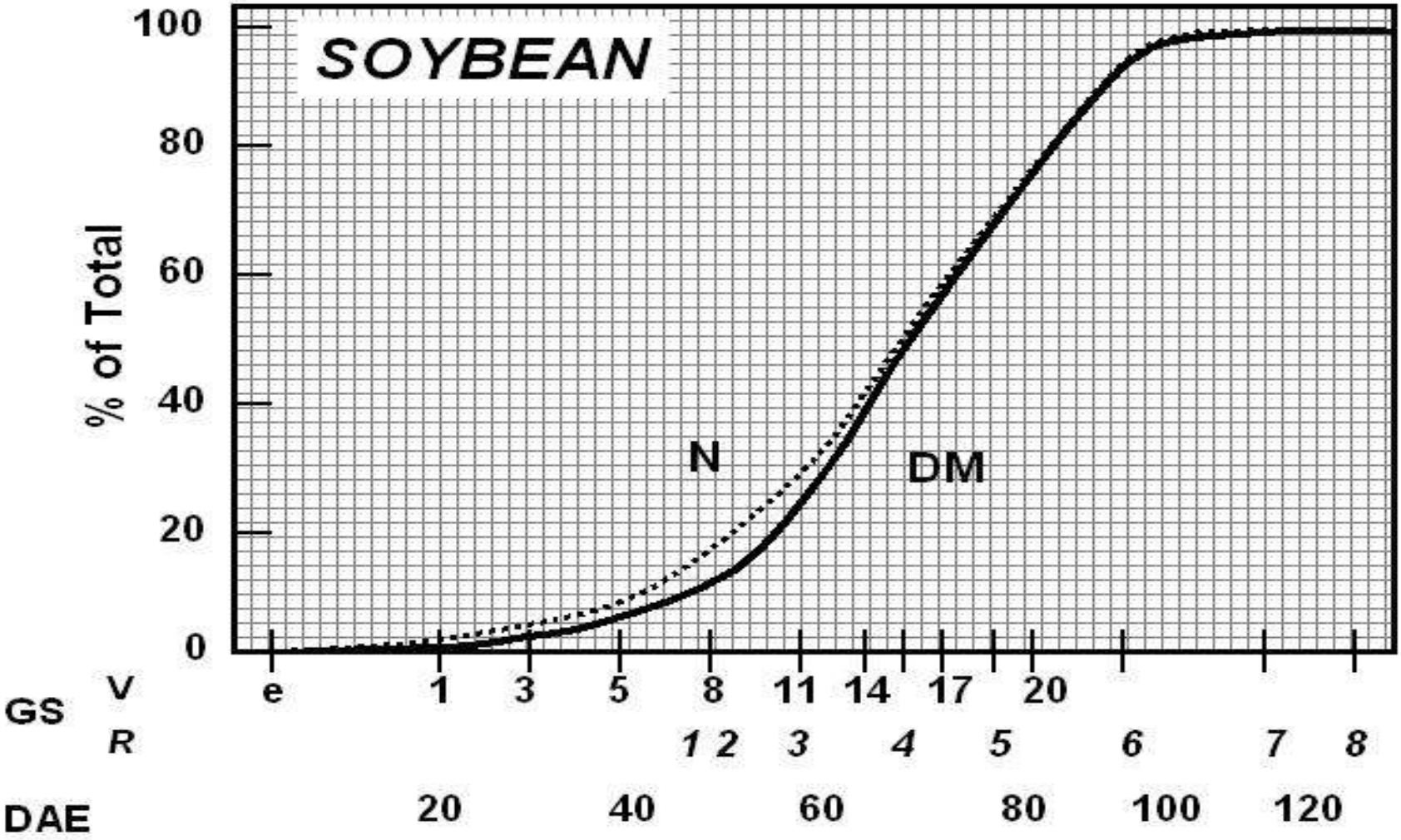


Figure 2: Growth Stage and Nitrogen Uptake Curves for Soybeans



S.W. Ritchie, J.J. Hanway, H.E. Thompson, and G.O. Benson. 1985. How a Soybean Plant Develops, Spec. Rep. #53, Iowa State Univ. Coop. Ext.

Table 2. Vegetative and Reproductive Stages for Soybeans

Vegetative Stages

VE Emergence - cotyledons above the soil surface

VC Cotyledon - unifoliolate leaves unrolled sufficiently so that the leaf edges are not touching

V1 First-node - fully developed leaves at unifoliolate node

V(n) nth-node - "n" represents the number of nodes on the main stem with fully developed leaves beginning with the unifoliolate leaves

Reproductive Stages

R1 Beginning bloom - one open flower at any node on the main stem

R2 Full bloom - open flower at one of the two uppermost nodes on the main stem with a fully developed flower

R3 Beginning pod - pod 3/16" long at one of the four uppermost nodes on the main stem with a fully developed leaf

R4 Full pod - pod 3/4" long at one of the four uppermost nodes on the main stem with a fully developed leaf

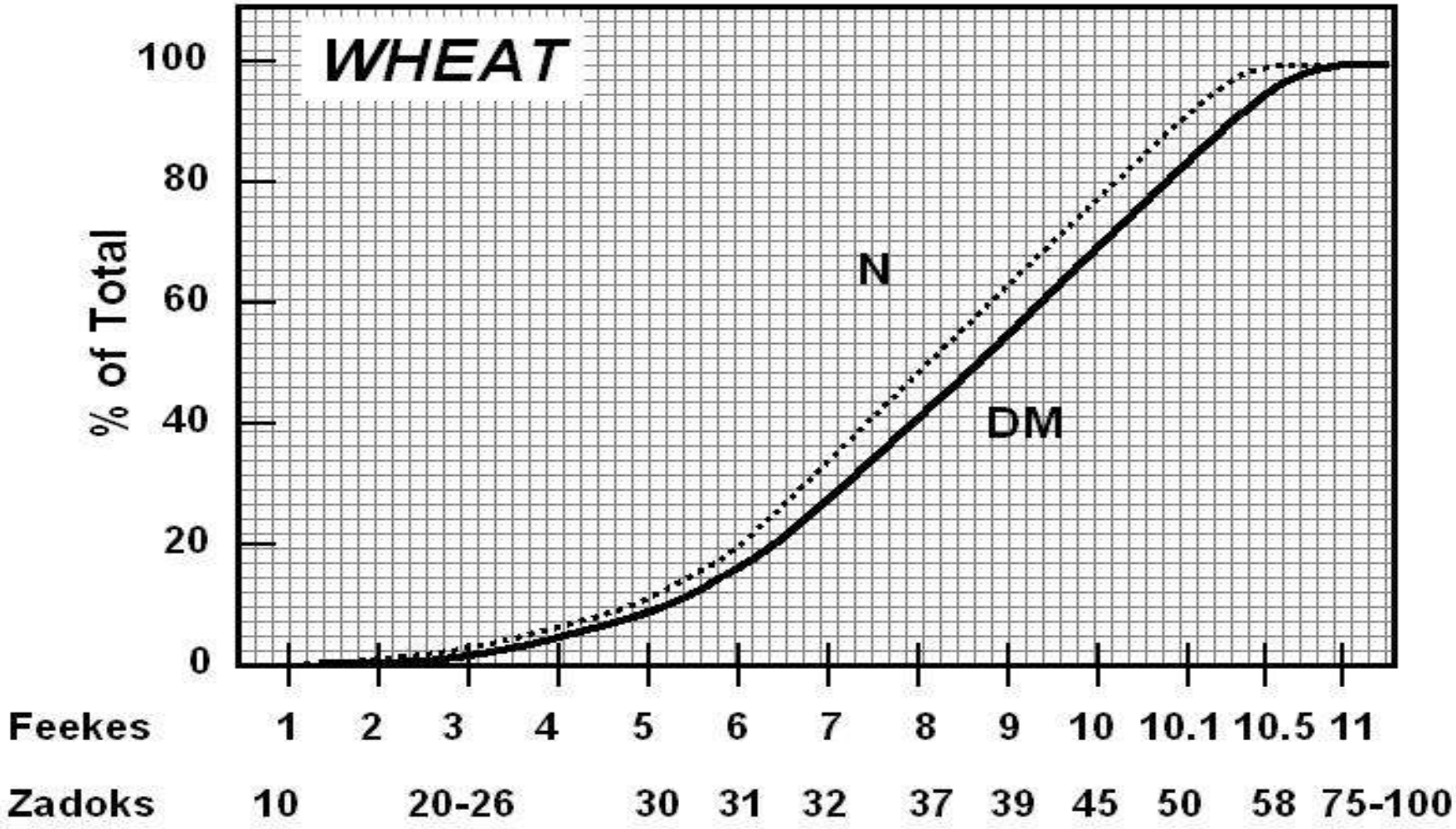
R5 Beginning seed - seed 1/8" long in a pod at one of the four uppermost nodes on the main stem with a fully developed leaf

R6 Full seed - pod containing a green seed that fills the pod cavity at one of the four uppermost nodes on the main stem with a fully developed leaf

R7 Beginning maturity - one normal pod on the main stem that has reached its mature pod color

R8 Full maturity - ninety-five percent of the pods have reached their mature pod color. Five to ten days of drying weather are required after R8 for the soybean moisture levels to be reduced to less than 15 percent

Figure 3: Growth Stage and Nitrogen Uptake Curves for Wheat



J. Hickman, J. Jacobsen, and D. Lyon. 1994. Best Management Practices for Wheat. NAWG & USDA Coop. Ext. System

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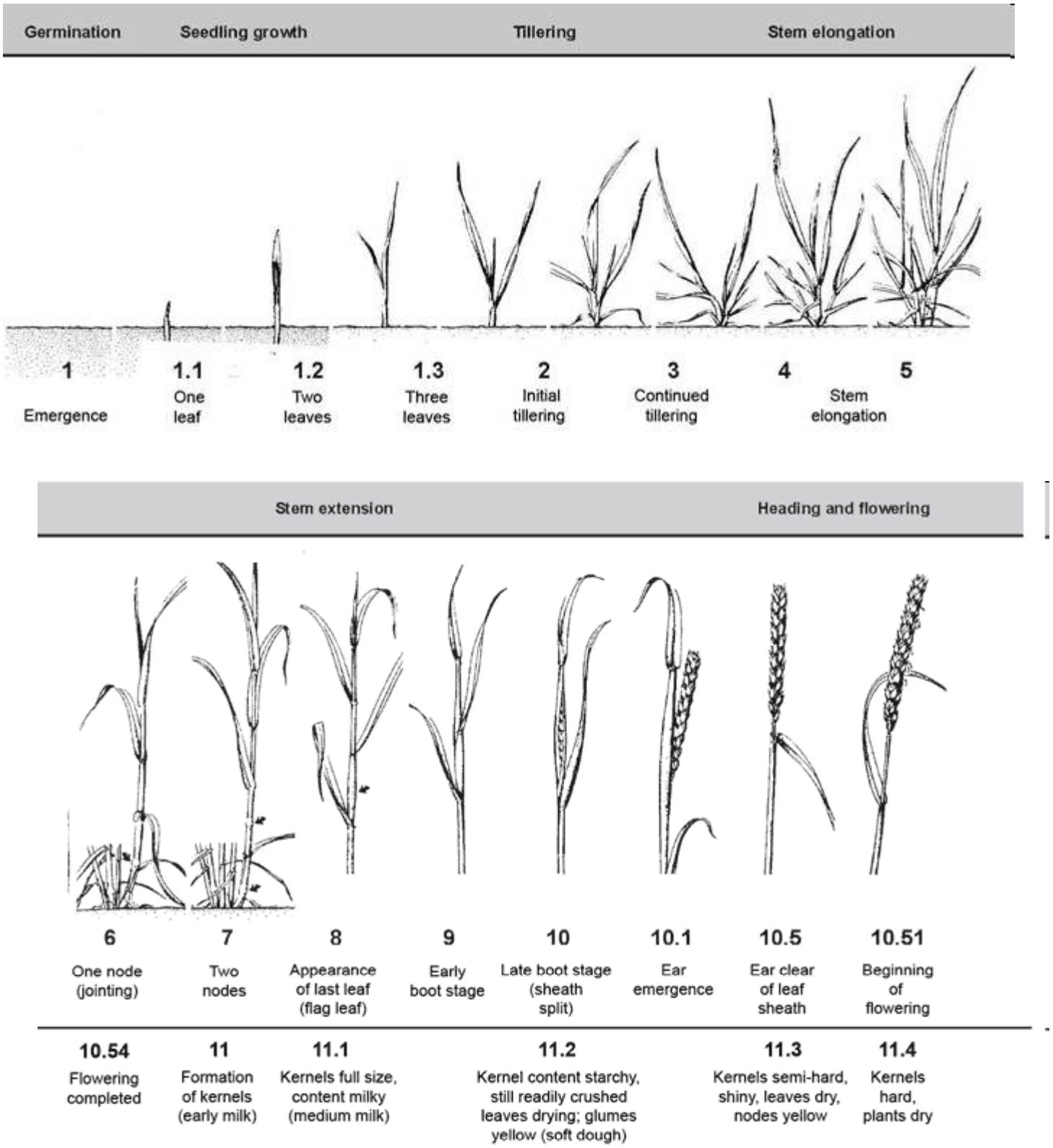
Drawing 2. Small Grain Growth Stages



State of North Carolina
Department of Environment and Natural Resources
Division of Water Quality

Registration Form for Manure Hauler Operations

The Division of Water Quality (Division) amended its rules for "Waste Not Discharged to Surface Waters" on September 1, 2006. Among the changes was the addition of registration and reporting requirements for manure hauler operations. A *manure hauler* is defined as any person who accepts or purchases animal waste and land applies the animal waste on land not covered by the generator's permit. In accordance with 15A NCAC 02T .1403(a)(2), any manure hauler that land-applies a total of more than one hundred (100) tons of animal waste per calendar year must register with the Division by September 1, 2007. Any new manure hauler operation that will exceed the 100-ton threshold must register with the Division prior to accepting or purchasing manure.

Please provide all of the following information in clear print:

1. Name of manure hauler: _____
2. Manure hauler company/organization (if applicable): _____
3. Mailing Address: _____

   City, State: _____ Zip: _____

   Telephone: (_____) _____ E-Mail: _____
4. Amount of animal waste land-applied: ☐ 100 – 750 tons/year ☐ > 750 tons/year
5. Counties/States from which manure is received: _____
6. Counties/States where manure is land-applied: _____

I hereby certify that the above information is correct and that I have read and understand the requirements for manure haulers contained in NCAC 02T .1400. I understand that there are significant penalties for submitting false information, including the possibility of fines.

Signature: _____ Date: _____

Please send this completed form to the following address:

North Carolina Division of Water Quality
Animal Feeding Operations Unit
1636 Mail Service Center
Raleigh, North Carolina 27699-1636

FORM: REG-MHO 12/06

Mortality Management Methods

(check which method(s) are being implemented)

- ❑ Burial three feet beneath the surface of the ground within 24 hours after knowledge of the death. The burial must be at least 300 feet from any flowing stream or public body of water.
- ❑ Rendering at a rendering plant licensed under G.S. 106-168.7
- ❑ Complete incineration
- ❑ In the case of dead poultry only, placing in a disposal pit of a size and design approved by the Department of Agriculture
- ❑ Any method which in the professional opinion of the State Veterinarian would make possible the salvage of part of a dead animal's value without endangering human or animal health. (Written approval of the State Veterinarian must be attached)

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ANIMAL WASTE MANAGEMENT SYSTEM
OPERATOR IN CHARGE
DESIGNATION FORM

ANIMAL WASTE MANAGEMENT SYSTEM:

_____

Facility ID Number: _____ County: _____

****

OPERATOR IN CHARGE_____

Home Mailing Address_____

City_____ **State**_____ **Zip**_____

Certificate #_____ **Social Security #**_____

Work Phone_____ **Home Phone**_____

Signature_____ **Date**_____

****

OWNER_____

Mailing Address_____ **City**_____

State_____ **Zip**_____ **Telephone#**_____

Signature_____ **Date**_____

****

Please Mail to: **WPCSOCC**
Division of Water Quality
1618 Mail Service Center
Raleigh, N.C. 27699-1618

SWCC Criteria for Technical Specialists Designation

Category	Role	Experience / Education / Other Requirements	Training Requirements
Collection, Storage, and/or Treatment (SD-Design, SI-Inspection)	Design and/or Installation Inspection of lagoons, storage ponds, dry stacks, storage structures, composters, pushoff ramps, curbing, settling basins and other similar structures.	1) NRCS job approval authority; or 2) Professional Engineer license	n/a
Runoff Controls (RC)	Development and implementation of filter strips, grass channels, and related nonstructural BMPs used to reduce runoff from exterior lots (primarily dairy operations)	1) Agency* designation of staff; or 2) Experience in design & implementation of nonstructural BMPs; or 3) Professional Engineer license.	n/a
Irrigation Equipment (I)	Design and installation of irrigation systems to include pipe size, pump horsepower, nozzle size, system layout, thrust blocks, etc. and operation plan to meet criteria of Waste Utilization Plan (hours per set, etc.).	1) Design Certification by National Irrigation Association; or 2) Professional Engineer license; or 3) Agency* designation of staff	n/a
Wettable Acres (/WA)	Determine wettable acres in accordance with Certified Animal Waste Management Plan	1) I or WUP Designation, or 2) Agency* designation of staff	Attend CES Wettable Acres Training Course
Waste Utilization Plan (WUP)	1) Develop .0200 waste management plans 2) Certify other items associated with animal waste, i.e. lagoon volumes.	Professional Engineer licensed before April 1, 2003.	1) PLAT Course 2) Conservation Planning with RUSLE
		Professional Engineer licensed after April 1, 2003.	1) Nutrient Management by CES (or NRCS**) 2) NC Nutrient Management Software 3) PLAT Course 4) Conservation Planning with RUSLE
Waste Utilization Plan / Nutrient Management (WUP/NM)	1) Develop .0200 animal waste plans 2) Certify other items associated with animal waste, i.e. lagoon closures 3) Approve river basin nutrient management plans 4) Certify the Land Application component of a USDA Comprehensive Nutrient Management Plan	1) Previous WUP designation; or 2) 3 years of nutrient management planning for animal waste; or 3) 4 year degree in agronomy or related field; or 4) a combination of education and experience totaling 4 years; or 5) Agency* designation of staff	New Applicants: 1) Nutrient Management by CES (or NRCS**) 2) NC Nutrient Management Software All: Upon adoption of a revised nutrient management standard 1) PLAT Course 2) Conservation Planning with RUSLE
Water Management (WM)	Design and installation approval of subsurface water management systems	1) NRCS job approval authority; or 2) PE license	n/a

- *Includes NRCS, SWCD staff under NRCS, CES, DSWC, and NCDA&CS
- ** Only offered when NCSU Course is unavailable

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GENERAL GUIDELINES FOR SWINE ON DRY LOTS

(Revised July 23, 1997)

1. Runoff control: Surface runoff from outside the dry lot must be diverted away from the dry lots. Efforts should be made to prevent runoff from leaving the dry lot from storms less severe than the 25-year, 24-hour storm event.
2. Filter Strips: hogs must be located as far as practical from swamps and streams. A minimum of a 100-foot filter must be maintained between the dry lots and streams, ponds, swamps and ditches. The filter strip must be protected by a fence. Spreader diversions must be used as needed to insure sheet flow. Where a 100-foot filter strip cannot be installed, the use of a diversion or other means is required to gain at least the effective filter area as would exist if the 100-foot filter were in place.
3. Soils: Efforts must be made to avoid soils that have a high leaching potential and those that are highly erodible.
4. Rotation: Hogs must be rotated using a minimum of two lots. The maximum amount of time for hogs to be on a single lot is one year. The amount of time off the lot must be sufficient for vegetation to approach maturity to maximize nutrient uptake.
5. Crops: The crop grown on a site must be harvested or grazed. A uniform stand vegetation must be reestablished with 30 days from the time the animals are removed. Land smoothing may be required prior to seedbed preparation.

Swine Farm Waste Management Odor Control Checklist

Source	Cause	BMPs to Minimize Odor	Site Specific Practices
Farmstead	• Swine production	❒ Vegetative or wooded buffers ❒ Recommended best management practices ❒ Good judgment and common sense	
Animal body surfaces	• Dirty manure-covered animals	❒ Dry floors	
Floor surfaces	• Wet manure-covered floors	❒ Slotted floors ❒ Waterers located over slotted floors ❒ Feeders at high end of solid floors ❒ Scrape manure buildup from floors ❒ Underfloor ventilation for drying	
Manure collection pits	• Urine • Partial microbial decomposition	❒ Frequent manure removal by flush, pit recharge, or scrape ❒ Underfloor ventilation	
Ventilation exhaust fans	• Volatile gases • Dust	❒ Fan maintenance ❒ Efficient air movement	
Indoor surfaces	• Dust	❒ Washdown between groups of animals ❒ Feed additives ❒ Feeder covers ❒ Feed delivery downspout extenders to feeder covers	
Flush tanks	• Agitation of recycled lagoon liquid while tanks are filling	❒ Flush tank covers ❒ Extend fill lines to near bottom of tanks with anti-siphon vents	
Flush alleys	• Agitation during wastewater conveyance	❒ Underfloor flush with underfloor ventilation	

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Swine Farm Waste Management Odor Control Checklist

Source	Cause	BMPs to Minimize Odor	Site Specific Practices
Pit recharge points	• Agitation of recycled lagoon liquid while pits are filling	❒ Extend recharge lines to near bottom of pits with anti-siphon vents	
Lift stations	• Agitation during sump tank filling and drawdown	❒ Sump tank covers	
Outside drain collection or junction boxes	• Agitation during wastewater conveyance	❒ Box covers	
End of drainpipes at lagoon	• Agitation during wastewater conveyance	❒ Extend discharge point of pipes underneath lagoon liquid level	
Lagoon surfaces	• Volatile gas emissions • Biological mixing • Agitation	❒ Proper lagoon liquid capacity ❒ Correct lagoon startup procedures ❒ Minimum surface area-to-volume ratio ❒ Minimum agitation when pumping ❒ Mechanical aeration ❒ Proven biological additives	
Irrigation sprinkler nozzles	• High pressure agitation • Wind drift	❒ Irrigate on dry days with little or no wind ❒ Minimum recommended operating pressure ❒ Pump intake near lagoon liquid surface ❒ Pump from second-stage lagoon	
Storage tank or basin surface	• Partial microbial decomposition • Mixing while filling • Agitation when emptying	❒ Bottom or midlevel loading ❒ Tank covers ❒ Basin surface mats of solids ❒ Proven biological additives or oxidants	

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Swine Farm Waste Management Odor Control Checklist

Source	Cause	BMPs to Minimize Odor	Site Specific Practices
Settling basin surface	• Partial microbial decomposition • Mixing while filling • Agitation when emptying	❒ Extend drainpipe outlets underneath liquid level ❒ Remove settled solids regularly	
Manure, slurry, or sludge spreader outlets	• Agitation when spreading • Volatile gas emissions	❒ Soil injection of slurry/sludges ❒ Wash residual manure from spreader after use ❒ Proven biological additives or oxidants	
Uncovered manure, slurry, or sludge on field surfaces	• Volatile gas emissions while drying	❒ Soil injection of slurry/sludges ❒ Soil incorporation within 48 hours ❒ Spread in thin uniform layers for rapid drying ❒ Proven biological additives or oxidants	
Dead animals	• Carcass decomposition	❒ Proper disposition of carcasses	
Dead animal disposal pits	• Carcass decomposition	❒ Complete covering of carcasses in burial pits ❒ Proper location/construction of disposal pits	
Incinerators	• Incomplete combustion	❒ Secondary stack burners	
Standing water around facilities	• Improper drainage • Microbial decomposition of organic matter	❒ Grade and landscape such that water drains away from facilities	
Manure tracked onto public roads from farm access	• Poorly maintained access roads	❒ Farm access road maintenance	

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Additional Information:	Available From:
Swine Manure Management; .0200 Rule/BMP Packet	NCSU, County Extension Center
Swine Production Farm Potential Odor Sources and Remedies; EBAE Fact Sheet	NCSU—BAE
Swine Production Facility Manure Management: Pit Recharge—Lagoon Treatment; EBAE 128-88	NCSU—BAE
Swine Production Facility Manure Management: Underfloor Flush—Lagoon Treatment; EBAE 129-88	NCSU—BAE
Lagoon Design and Management for Livestock Manure Treatment and Storage; EBAE 103-83	NCSU—BAE
Calibration of Manure and Wastewater Application Equipment; EBAE Fact Sheet	NCSU—BAE
Controlling Odors from Swine Buildings; PIH-33	NCSU—Swine Extension
Environmental Assurance Program; NPPC Manual	N.C. Pork Producers Assoc.
Options for Managing Odor; a report from the Swine Odor Task Force	NCSU Agricultural Communications
Nuisance Concerns in Animal Manure Management: Odors and Flies; PRO107, 1995 Conference Proceedings	Florida Cooperative Extension

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ANIMAL WASTE LAND APPLICATION SETBACKS*
UPDATED SEPTEMBER 20, 2006
SB 1217 INTERAGENCY GROUP

Setbacks for swine waste land application areas vary according to permit, the date of facility siting and/or the date the waste application field is placed in use. Setbacks for other types of operations with coverage under State General Permits and as defined in G.S. 143-215.10B, have a single setback requirement. The following outline provides setback requirements by time periods and legislation.

I. All operations meeting the G.S. 143-215.10B definitions (formerly 2H.0200 thresholds), including swine farms sited or expanded before September 30, 1995 are required to have from the outer perimeter of the waste application area the following:

   A. A 25-foot vegetative buffer from perennial water (2H.0217 (h)(iii))
   B. A 200-foot distance to dwelling not owned by the producer (NRCS Standard Code 633)
   C. A 100-foot distance to a well (NRCS Standard Code 633 Standard)

For swine farms with a waste application field put in place after August 27, 1997 category IV applies:

II. Swine farms sited after September 30, 1995 and constructed or expanded before August 27, 1997 must meet items I A, B, and C and have from the outer perimeter of the waste application area the following:

   A. A 50-foot distance to perennial stream/river other than an irrigation ditch or canal (Senate Bill 1080)
   B. A 50-foot distance to a residential property boundary (Senate Bill 1080)

For waste application fields put in place after August 27, 1997 category IV applies:

III. Swine farms sited or expanded after August 27, 1997 must meet the requirements of items I A, B, and C and must have from the outer perimeter of the waste application area the following:

   A. A 75-foot distance to a perennial stream/river other than an irrigation ditch or canal (House Bill 515)
   B. A 75-foot distance to a residential property boundary (House Bill 515)

IV. Any swine farm regardless of siting date must meet the 75-foot requirements of item III for any new waste application field put in use after August 27, 1997 which:

   A. As of August 27, 1997, the waste application field was not within the property boundary where the waste was generated or
   B. As of August 27, 1997, the waste application field was not within the property boundary where waste was previously applied from the operation.

Other new waste application fields within the property boundary where the waste is generated or has been previously applied are not required to meet the 75-foot buffer, but must comply with items I and II.

---

* Guidance does not reflect Neuse, Tar-Pam and Jordan Lake Rule requirements

V. **All farms renewing NPDES permits after that date must implement one or a combination of the following waste application setbacks from surface waters including streams, lakes, and other surface waters, and conduits to those waters (40 CFR 412.4):**

- **A. 100-foot setback (no closer than 100 feet to any down-gradient surface waters, open tile line intake structures, sinkholes, agricultural well heads, or other conduits to surface waters);**
- **B. 35-foot wide vegetated buffer can be substituted for the 100-foot setback specified in A;**
- **C. 20-foot wide vegetated setback with water table control structures to trap particulate nutrient losses, or any other compliance alternative approved by the Director of DWQ that provides pollutant reductions equivalent or better than reductions achieved by the 100-foot setback specified in A.**

Wettable Acres Determination Certification

Name of Facility:_____ Facility Number:_____-_____

Owner(s) Name:_____ Phone No:_____

Mailing Address:_____

By signing this form, the facility owner and Technical Specialist acknowledge the completion of the Wettable Acres Determination. All necessary Wettable Acres Determination Field Data Sheets and calculations were completed to conduct a Wettable Acre Determination. The facility's Waste Utilization Plan has been amended as necessary to reflect actual wetted acreage. A copy of all worksheets, calculations, and other Wetted Acres Determination documents, along with the applicable Waste Utilization Plan and Wettable Acre Determination Certification will be filed with the local Soil and Water Conservation District. A copy will also be kept on site with the Certified Animal Waste Management Plan. Any future modifications must be approved by a technical specialist and filed with the Soil and Water Conservation District prior to implementation. If any modifications to the existing irrigation system or any new irrigation equipment was required to adequately address the waste management needs of this facility, an Irrigation Specialist or Professional Engineer has certified the design and installation below.

Owner Name:_____

Owner Signature:_____Date:_____

Technical Specialist Name:_____

Technical Specialist Signature:_____Date:_____

If assisted by an Irrigation Specialist or Professional Engineer please read and sign below:

Animal waste application equipment has been designed or modified to apply waste as necessary to accommodate the waste management plan and according to NRCS Standards. Animal waste application equipment has been installed according to NRCS Standards and is ready for use.

Irrigation Specialist/PE Name:_____

Irrigation Specialist/PE Signature:_____Date:_____

Submit this form to:
NC Division of Water Quality
Animal Feeding Operations Unit
1636 Mail Service Center
Raleigh, NC 27699-1636

EMERGENCY ACTION PLAN

PHONE NUMBERS

DWQ	_____
EMERGENCY MANAGEMENT SYSTEM	_____
SWCD	_____
NRCS	_____

This plan will be implemented in the event that wastes from your operation are leaking, overflowing, or running off site. You should not wait until wastes reach surface waters or leave your property to consider that you have a problem. You should make every effort to ensure that this does not happen. This plan should be posted in an accessible location for all employees at the facility. The following are some action items you should take.

1. Stop the release of wastes. Depending on the situation, this may or may not be possible. Suggested responses to some possible problems are listed below.

   A. Lagoon overflow-possible solutions are:

      a. Add soil to berm to increase elevation of dam.
      b. Pump wastes to fields at an acceptable rate.
      c. Stop all flows to the lagoon immediately.
      d. Call a pumping contractor.
      e. Make sure no surface water is entering lagoon.

   B: Runoff from waste application field-actions include:

      a. Immediately stop waste application.
      b. Create a temporary diversion to contain waste.
      c. Incorporate waste to reduce runoff.
      d. Evaluate and eliminate the reason(s) that caused the runoff.
      e. Evaluate the application rates for the fields where runoff occurred.

   C: Leakage from the waste pipes and sprinklers-action include:

      a. Stop recycle pump.
      b. Stop irrigation pump.
      c. Close valves to eliminate further discharge.
      d. Repair all leaks prior to restarting pumps.

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D: Leakage from flush systems, houses, solid separators-action include:

a. Stop recycle pump.
b. Stop irrigation pump.
c. Make sure no siphon occurs.
d. Stop all flows in the house, flush systems, or solid separators.
e. Repair all leaks prior to restarting pumps.

E: Leakage from base or sidewall of lagoon. Often this is seepage as opposed to flowing leaks- possible action:

a. Dig a small sump or ditch away from the embankment to catch all seepage, put in a submersible pump, and pump back to lagoon.
b. If holes are caused by burrowing animals, trap or remove animals and fill holes and compact with a clay type soil.
c. Have a professional evaluate the condition of the side walls and lagoon bottom as soon as possible.

2. Assess the extent of the spill and note any obvious damages.

a. Did the waste reach any surface waters?
b. Approximately how much was released and for what duration?
c. Any damage noted, such as employee injury, fish kills, or property damage?
d. Did the spill leave the property?
e. Does the spill have the potential to reach surface waters?
f. Could a future rain event cause the spill to reach surface waters?
g. Are potable water wells in danger (either on or off of the property)?
h. How much reached surface waters?

3: Contact appropriate agencies.

a. During normal business hours, call your DWQ (Division of Water Quality) regional office; Phone - - . After hours, emergency number: 919-733-3942. Your phone call should include: your name, facility, telephone number, the details of the incident from item 2 above, the exact location of the facility, the location or direction of movement of the spill, weather and wind conditions. The corrective measures that have been under taken, and the seriousness of the situation.
b. If spill leaves property or enters surface waters, call local EMS Phone number - - .
c. Instruct EMS to contact local Health Department.
d. Contact CES, phone number - - , local SWCD office phone number - - , and local NRCS office for advice/technical assistance phone number - - .

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4: If none of the above works call 911 or the Sheriff's Department and explain your problem to them and ask that person to contact the proper agencies for you.

5: Contact the contractor of your choice to begin repair of problem to minimize off-site damage.

a. Contractors Name:_____
b. Contractors Address:_____
c. Contractors Phone:_____

6: Contact the technical specialist who certified the lagoon (NRCS, Consulting Engineer, etc.)

a. Name:_____
b. Phone:_____

7: Implement procedures as advised by DWQ and technical assistance agencies to rectify the damage, repair the system, and reassess the waste management plan to keep problems with release of wastes from happening again.

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Animal Waste Application Windows[1]
For Common Crops Which Receive Animal Waste

These application windows include 30 days prior to planting and greenup of Bermudagrass.
End 30 days before harvest.

Bermudagrass		Begin March 1st	End September 30th
Small Grain Overseeded in Bermudagrass		Begin October 1st	End March 31st
Corn		Begin February 15th	End June 30th
Cotton		Begin March 15th	End August 1st
Cucumbers	- Direct consumption	Begin March 1st (100 % at planting)	
	- For Processing (2 seasons)	Begin April 1st	End May 31st
		Begin July 1st	End August 31st
Rye		Begin September 1st	End March 31st
Barley, Oats, Triticale		Begin September 1st	End April 15th
Wheat		Begin September 1st	End April 30th
Peanuts		Begin April 1st	End September 30th
Sorghum/ Sudan Grass Hay		Begin March 15th	End August 31st
Soybeans		Begin April 1st	End September 15th
Tobacco	- Flue Cured	Begin March 15th	End June 30th
	- Burley	Begin May 15th	End August 15th
Fescue[2]		Begin August 1st	End July 31st

[1] Dates shown represent statewide limits. Planting and harvesting dates vary across the state and from year to year. Actual values shall reflect site specific conditions and in no case allow application more than either 30 days prior to planting/breaking dormancy or less than 30 days before harvest. See General Permit for food crops

[2] Mountains – limit N application during June and July / no nitrogen in December and January
Piedmont & Coastal Plain – limit N application during June and July / no nitrogen in Dec and Jan during severe winters.

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Article 67.
Swine Farms.

§ 106-800. Title.

This Article shall be known as the "Swine Farm Siting Act". (1995, c. 420, s. 1; 1995 (Reg. Sess., 1996), c. 626, s. 7(a); 1997-458, s. 4.1.)

§ 106-801. Purpose.

The General Assembly finds that certain limitations on the siting of swine houses and lagoons for swine farms can assist in the development of pork production, which contributes to the economic development of the State, by lessening the interference with the use and enjoyment of adjoining property. (1995, c. 420, s. 1; 1995 (Reg. Sess., 1996), c. 626, s. 7(a); 1997-458, s. 4.1.)

§ 106-802. Definitions.

As used in this Article, unless the context clearly requires otherwise:

(1) "Lagoon" means a confined body of water to hold animal byproducts including bodily waste from animals or a mixture of waste with feed, bedding, litter or other agricultural materials.

(2) Repealed by Session Laws 1995 (Regular Session, 1996), c. 626, s. 7.

(3) "Occupied residence" means a dwelling actually inhabited by a person on a continuous basis as exemplified by a person living in his or her home.

(3a) "Outdoor recreational facility" means any plot or tract of land on which there is located an outdoor swimming pool, tennis court, or golf course that is open to either the general public or to the members and guests of any organization having 50 or more members.

(4) "Site evaluation" means an investigation to determine if a site meets all federal and State standards as evidenced by the Waste Management Facility Site Evaluation Report on file with the Soil and Water Conservation District office or a comparable report certified by a professional engineer or a comparable report certified by a technical specialist approved by the North Carolina Soil and Water Conservation Commission.

(5) "Swine farm" means a tract of land devoted to raising 250 or more animals of the porcine species.

(6) "Swine house" means a building that shelters porcine animals on a continuous basis. (1995, c. 420, s. 1; 1995 (Reg. Sess., 1996), c. 626, s. 7(a); c. 743, s. 3; 1997-443, s. 11A.119(a); 1997-456, s. 15; 1997-458, s. 4.1; 1997-496, s. 12.)

§ 106-803. Siting requirements for swine houses, lagoons, and land areas onto which waste is applied at swine farms.

(a) A swine house or a lagoon that is a component of a swine farm shall be located:

(1) At least 1,500 feet from any occupied residence.

(2) At least 2,500 feet from any school; hospital; church; outdoor recreational facility; national park; State Park, as defined in G.S. 113-44.9; historic property acquired by the State pursuant to G.S. 121-9 or listed in the North Carolina Register of Historic Places pursuant to G.S. 121-4.1; or child care center, as defined in G.S. 110-86, that is licensed under Article 7 of Chapter 110 of the General Statutes.

(3) At least 500 feet from any property boundary.

(4) At least 500 feet from any well supplying water to a public water system, as defined in G.S. 130A-313.

(5) At least 500 feet from any other well that supplies water for human consumption. This subdivision does not apply to a well located on the same parcel or tract of land on which the swine house or lagoon is located and that supplies water only for use on that parcel or tract of land or for use on adjacent parcels or tracts of land all of which are under common ownership or control.

(a1) The outer perimeter of the land area onto which waste is applied from a lagoon that is a component of a swine farm shall be at least 75 feet from any boundary of property on which an occupied residence is located and from any perennial stream or river, other than an irrigation ditch or canal.

(a2) No component of a liquid animal waste management system for which a permit is required under Part 1 or 1A of Article 21 of Chapter 143 of the General Statutes, other than a land application site, shall be constructed on land that is located within the 100-year floodplain.

(b) A swine house or a lagoon that is a component of a swine farm may be located closer to a residence, school, hospital, church, or a property boundary than is allowed under subsection (a) of this section if written permission is given by the owner of the property and recorded with the Register of Deeds. (1995, c. 420, s. 1; 1995 (Reg. Sess., 1996), c. 626, s. 7(a); 1997-458, s. 4.1.)

§ 106-804. Enforcement.

(a) Any person who owns property directly affected by the siting requirements of G.S. 106-803 pursuant to subsection (b) of this section may bring a civil action against the owner or operator of a swine farm who has violated G.S. 106-803 and may seek any one or more of the following:

(1) Injunctive relief.

(2) An order enforcing the siting requirements under G.S. 106-803.

(3) Damages caused by the violation.

(b) A person is directly affected by the siting requirements of G.S. 106-803 only if the person owns a facility or property located within the siting requirements specified under G.S. 106-803.

(c) If the court determines it is appropriate, the court may award court costs, including reasonable attorneys' fees and expert witnesses' fees, to any party. If a temporary restraining order or preliminary injunction is sought, the court may require the filing of a bond or equivalent security. The court shall determine the amount of the bond or security.

(d) Nothing in this section shall restrict any other right that any person may have under any statute or common law to seek injunctive or other relief. (1995 (Reg. Sess., 1996), c. 626, s. 7(a); 1997-458, s. 4.1.)

§ 106-805. Written notice of swine farms.

Any person who intends to construct a swine farm whose animal waste management system is subject to a permit under Part 1 or 1A of Article 21 of Chapter 143 of the General Statutes shall, after completing a site evaluation and before the farm site is modified, notify all adjoining property owners; all property owners who own property located across a public road, street, or highway from the swine farm; the county or counties in which the farm site is located; and the local health department or departments having jurisdiction over the farm site of that person's intent to construct the swine farm. This notice shall be by certified mail sent to the address on record at the property tax office in the county in which the land is located. Notice to a county shall be sent to the county manager or, if there is no county manager, to the chair of

the board of county commissioners. Notice to a local health department shall be sent to the local health director. The written notice shall include all of the following:

(1) The name and address of the person intending to construct a swine farm.

(2) The type of swine farm and the design capacity of the animal waste management system.

(3) The name and address of the technical specialist preparing the waste management plan.

(4) The address of the local Soil and Water Conservation District office.

(5) Information informing the adjoining property owners and the property owners who own property located across a public road, street, or highway from the swine farm that they may submit written comments to the Division of Water Resources, Department of Environment and Natural Resources. (1995 (Reg. Sess., 1996), c. 626, s. 7(a); 1996, 2nd Ex. Sess., c. 18, s. 27.34(d); 1997-443, s. 11A.119(a); 1997-458, s. 4.1; 2013-413, s. 57(d).)

§ 106-806. Construction or renovation of swine houses at preexisting swine farms.

(a) As used in this section, the following definitions apply:

(1) "New swine farm" means any swine farm the operations of which were sited on or after October 1, 1995. "New swine farm" does not include any preexisting swine farm, even if a subsequent site evaluation is performed on or after October 1, 1995, at the preexisting swine farm.

(2) "Preexisting swine farm" means any swine farm either the operations of which were begun prior to October 1, 1995, or the site evaluation of which was approved prior to October 1, 1995, by the Department of Environment and Natural Resources under Part 1A of Article 21 of Chapter 143 of the General Statutes.

(3) "Renovation or construction," "renovated or constructed," and any similar phrase mean any activity to renovate, construct, reconstruct, rebuild, modify, alter, change, restructure, upgrade, improve, enlarge, reduce, move, or otherwise perform construction work on a swine house that is a component of a swine farm.

(b) Notwithstanding any other provisions of this Article, a swine house that is a component of a preexisting swine farm can be constructed or renovated if the construction or renovation of that swine house satisfies all of the following requirements:

(1) The construction or renovation of the swine house does not result in an increase in the permitted capacity of the swine farm, as measured in the annual steady state live weight capacity of the swine farm.

(2) The construction or renovation of the swine house does not result in requiring an increase in the total permitted capacity of the animal waste management systems located at the swine farm.

(3) Except as provided in subsection (c) of this section, for any swine house that fails to meet any siting requirement for a swine house under G.S. 106-803, the construction or renovation of the swine house does not result in any portion of the constructed or renovated swine house being located any closer to the building or the property that is the object of the siting requirement that the swine house fails to meet.

(4) Regardless of the footprint of the existing swine house, renovation or construction of a swine house shall not be allowed in the 100-year floodplain.

(c) A swine house that is a component of a preexisting swine farm can be constructed or renovated such that it results in a portion of the constructed or renovated swine house being

located closer to a residence, school, hospital, church, or a property boundary than is allowed under subdivision (3) of subsection (b) of this section if written permission is given by the owner or owners of the property directly affected by the siting requirements specified under G.S. 106-803 and recorded with the register of deeds.

(d) This section does not apply to the construction or renovation of a swine house that is a component of a new swine farm. (2011-118, s. 1.)

§ 106-807. Reserved for future codification purposes.

§ 106-808. Reserved for future codification purposes.

§ 106-809. Reserved for future codification purposes.

Welcome to QuickFacts

Bladen County, North Carolina

QuickFacts provides statistics for all states and counties, and for cities and towns with a population of 5,000 or more.

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QuickFacts

People	Bladen County, North Carolina	UNITED STATES
Population		
Population estimates, July 1, 2015, (V2015)	34,318	321,418,820
Population estimates base, April 1, 2010, (V2015)	35,190	308,758,105
Population, percent change - April 1, 2010 (estimates base) to July 1, 2015, (V2015)	-2.5%	4.1%
Population, Census, April 1, 2010	35,190	308,745,538
Age and Sex		
Persons under 5 years, percent, July 1, 2015, (V2015)	5.1%	6.2%
Persons under 5 years, percent, April 1, 2010	6.1%	6.5%
Persons under 18 years, percent, July 1, 2015, (V2015)	21.5%	22.9%
Persons under 18 years, percent, April 1, 2010	23.1%	24.0%
Persons 65 years and over, percent, July 1, 2015, (V2015)	19.4%	14.9%
Persons 65 years and over, percent, April 1, 2010	15.6%	13.0%
Female persons, percent, July 1, 2015, (V2015)	52.0%	50.8%
Female persons, percent, April 1, 2010	52.0%	50.8%
Race and Hispanic Origin		
White alone, percent, July 1, 2015, (V2015) (a)	60.8%	77.1%
White alone, percent, April 1, 2010 (a)	56.3%	72.4%
Black or African American alone, percent, July 1, 2015, (V2015) (a)	34.3%	13.3%
Black or African American alone, percent, April 1, 2010 (a)	34.9%	12.6%
American Indian and Alaska Native alone, percent, July 1, 2015, (V2015) (a)	3.0%	1.2%
American Indian and Alaska Native alone, percent, April 1, 2010 (a)	2.1%	0.9%
Asian alone, percent, July 1, 2015, (V2015) (a)	0.3%	5.6%
Asian alone, percent, April 1, 2010 (a)	0.2%	4.8%
Native Hawaiian and Other Pacific Islander alone, percent, July 1, 2015, (V2015) (a)	Z	0.2%
Native Hawaiian and Other Pacific Islander alone, percent, April 1, 2010 (a)	Z	0.2%
Two or More Races, percent, July 1, 2015, (V2015)	1.5%	2.6%
Two or More Races, percent, April 1, 2010	1.5%	2.9%
Hispanic or Latino, percent, July 1, 2015, (V2015) (b)	7.9%	17.6%
Hispanic or Latino, percent, April 1, 2010 (b)	7.1%	16.3%
White alone, not Hispanic or Latino, percent, July 1, 2015, (V2015)	54.5%	61.6%
White alone, not Hispanic or Latino, percent, April 1, 2010	54.7%	63.7%
Population Characteristics		

Veterans, 2010-2014	2,128	20,700,711
Foreign born persons, percent, 2010-2014	4.8%	13.1%
Housing		
Housing units, July 1, 2015, (V2015)	17,636	134,789,944
Housing units, April 1, 2010	17,718	131,704,730
Owner-occupied housing unit rate, 2010-2014	68.2%	64.4%
Median value of owner-occupied housing units, 2010-2014	$86,100	$175,700
Median selected monthly owner costs -with a mortgage, 2010-2014	$996	$1,522
Median selected monthly owner costs -without a mortgage, 2010-2014	$371	$457
Median gross rent, 2010-2014	$614	$920
Building permits, 2015	42	1,182,582
Families and Living Arrangements		
Households, 2010-2014	14,407	116,211,092
Persons per household, 2010-2014	2.38	2.63
Living in same house 1 year ago, percent of persons age 1 year+, 2010-2014	91.9%	85.0%
Language other than English spoken at home, percent of persons age 5 years+, 2010-2014	6.2%	20.9%
Education		
High school graduate or higher, percent of persons age 25 years+, 2010-2014	77.4%	86.3%
Bachelor's degree or higher, percent of persons age 25 years+, 2010-2014	11.5%	29.3%
Health		
With a disability, under age 65 years, percent, 2010-2014	16.2%	8.5%
Persons without health insurance, under age 65 years, percent	⚠ 18.6%	⚠ 10.5%
Economy		
In civilian labor force, total, percent of population age 16 years+, 2010-2014	53.0%	63.5%
In civilian labor force, female, percent of population age 16 years+, 2010-2014	50.1%	58.7%
Total accommodation and food services sales, 2012 ($1,000) (c)	25,569	708,138,598
Total health care and social assistance receipts/revenue, 2012 ($1,000) (c)	52,726	2,040,441,203
Total manufacturers shipments, 2012 ($1,000) (c)	1,904,327	5,696,729,632
Total merchant wholesaler sales, 2012 ($1,000) (c)	226,655	5,208,023,478
Total retail sales, 2012 ($1,000) (c)	199,496	4,219,821,871
Total retail sales per capita, 2012 (c)	$5,714	$13,443
Transportation		
Mean travel time to work (minutes), workers age 16 years+, 2010-2014	24.6	25.7
Income and Poverty		
Median household income (in 2014 dollars), 2010-2014	$29,532	$53,482
Per capita income in past 12 months (in 2014 dollars), 2010-2014	$19,059	$28,555
Persons in poverty, percent	⚠ 25.6%	⚠ 13.5%

Businesses	Bladen County, North Carolina	UNITED STATES
Total employer establishments, 2014	512	7,563,085
Total employment, 2014	8,633	121,079,879
Total annual payroll, 2014	318,621	5,940,442,637
Total employment, percent change, 2013-2014	-17.5%	2.4%
Total nonemployer establishments, 2014	1,795	23,836,937
All firms, 2012	2,191	27,626,360
Men-owned firms, 2012	1,147	14,844,597

Women-owned firms, 2012	731	9,878,397
Minority-owned firms, 2012	476	7,952,386
Nonminority-owned firms, 2012	1,585	18,987,918
Veteran-owned firms, 2012	107	2,521,682
Nonveteran-owned firms, 2012	1,852	24,070,685

Geography	Bladen County, North Carolina	UNITED STATES
Population per square mile, 2010	40.2	87.4
Land area in square miles, 2010	874.33	3,531,905.43
Metropolitan or Micropolitan Statistical Area	None	None
FIPS Code	37017	00

Export to CSV Export to Excel

This geographic level of poverty and health estimates are not comparable to other geographic levels of these estimates

Some estimates presented here come from sample data, and thus have sampling errors that may render some apparent differences between geographies statistically indistinguishable. Click the Quick Info icon to the left of each row in TABLE view to learn about sampling error.

The vintage year (e.g., V2015) refers to the final year of the series (2010 thru 2015).
Different vintage years of estimates are not comparable.

(a) Includes persons reporting only one race
(b) Hispanics may be of any race, so also are included in applicable race categories
(c) Economic Census - Puerto Rico data are not comparable to U.S. Economic Census data

D Suppressed to avoid disclosure of confidential information
F Fewer than 25 firms
FN Footnote on this item in place of data
NA Not available
S Suppressed; does not meet publication standards
X Not applicable
Z Value greater than zero but less than half unit of measure shown

Up one level

North Carolina

QuickFacts data are derived from: Population Estimates, American Community Survey, Census of Population and Housing, Current Population Survey, Small Area Health Insurance Estimates, Small Area Income and Poverty Estimates, State and County Housing Unit Estimates, County Business Patterns, Nonemployer Statistics, Economic Census, Survey of Business Owners, Building Permits.

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FORM HAUL-1

Manure Hauler Operation Annual Reporting Form

Record of Manure Received

Manure Hauler Name: _____ Company Name: _____

Mailing Address: _____ Phone Number: _____

_____ Registration No.: _____

Date(s) Manure Received	Location Where Manure Was Generated			Amount (tons)
	Farm Name	Farm Address/Location	County/State	
			Total	

Submit completed form(s) for manure received during each calender year to the following address by March 1 of the following year:

NC DENR DWQ - Aquifer Protection Section
Animal Feeding Operations Unit
1636 Mail Service Center
Raleigh, North Carolina 27699-1636

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

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Signature: _____ Date: _____

FORM HAUL-2

Manure Hauler Operation Annual Reporting Form

Record of Manure Land Application - Medium Operations (100-750 tons/yr)

Manure Hauler Name: _____ Company Name: _____

Mailing Address: _____ Phone Number: _____

_____ Registration No.: _____

Date(s) of Application	Location of Land Application				Amount (tons)	Field Area (acres)
	Farm Address/Location	Tract No.	Field No.	County/State		
				Total		

Submit completed form(s) for manure land applied during each calender year to the following address by March 1 of the following year:

NC DENR DWQ - Aquifer Protection Section
Animal Feeding Operations Unit
1636 Mail Service Center
Raleigh, North Carolina 27699-1636

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Signature: _____ Date: _____

FORM HAUL-3

Manure Hauler Operation Annual Reporting Form

Record of Manure Land Application - Large Operations (750 or more tons/yr)

Manure Hauler Name: _____ Company Name: _____

Mailing Address: _____ Phone Number: _____

_____ Registration No.: _____

Date(s) of Application	Location of Land Application				Application Rate (tons/acre)	Waste Analysis		Receiving Crop	Field Area (acres)
	Farm Address/Location	Tract No.	Field No.	County/State		N (lb/ton)	P (lb/ton)		
								Total	

Submit completed form(s) for manure land applied during each calender year to the following address by March 1 of the following year:

NC DENR DWQ - Aquifer Protection Section
Animal Feeding Operations Unit
1636 Mail Service Center
Raleigh, North Carolina 27699-1636

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Signature: _____ Date: _____

Health Services

"Striving for a Healthier Community"

Environmental Health Services

The Environmental Health Department provides the following services:

- Septic tank permits for new installations and existing systems as well as repair of failing systems.
- Well permits for installation of new wells.
- Water sampling for bacterial and chemical analysis.
- Permits and inspections for facilities which provide food or lodging to the public (ex: restaurants, hotels).
- Permits and inspections of public swimming pools.
- Permits for tattoo facilities.
- Food and Lodging Inspections
- Vector control activities
- Lead poisoning investigations

These services are provided by the Food & Lodging section and the Water & Sewage section. Click here for a current listing of fees.

Certified Food Protection Manager Exam Information

Food and Lodging Section

The food and lodging section's primary responsibility is conducting sanitation inspections for public facilities, which provide food and / or lodging accommodations. Other responsibilities include: complaint investigations, lead poisoning investigations, food borne outbreak investigations, and plan review for new establishments. Administrative rules can be found at http://www.deh.enr.state.nc.us/rules.htm.

Sanitation Inspections

Duplin County Environmental Health is responsible for the sanitation grading of Restaurants, Food stands, Meat Markets, School Lunchrooms, Rest Homes, Nursing Homes, Hospitals, Childcare Centers and Lodging Facilities. Environmental Health Specialists are required to enforce North Carolina Rules and Regulations that govern the sanitation of these establishments.

During the inspection of a food handling establishment, there is an emphasis placed on factors that increase the chance of developing food borne illness. These critical risk factors are:

- Poor personal hygiene/employee health
- Food from unsafe sources
- Contaminated equipment/cross contamination
- Inadequate cooking temperatures
- Improper hot and cold holding temperatures, improper reheating, and improper cooling

Additionally, routine inspections check sewage disposal, water supply, restroom facilities, pest control, cleaning, lighting and ventilation, construction of floors, walls and ceilings and garbage disposal.

Once an inspection is complete, the findings and results of the inspection are documented, reviewed with the owner / operator, and a letter grade card is posted. Sanitation grade cards are posted where they may be readily observed by the public upon entering the establishment. All establishments are required by law to keep their grade card posted.

The sanitation grade is based on a 10 point scale and is as follows:

Grade A 90- 100%
Grade B 80- 89.5%
Grade C 70- 79.5%

Any establishment failing to score at least 70% will have its permit revoked immediately. Click the link for a current list of grades. View WRAL Restaurants Listing for Duplin County.

Childcare centers are inspected once every six month period by an Environmental Health Specialist. Additional inspections may be conducted at any child care facility as often as necessary to ensure compliance with applicable sanitation standards.

Temperatures, handling, and preparation of food are checked during inspections. Additionally, the following items are checked regularly during inspections: diapering and diaper changing facilities, furniture, toys, beds, cots, linen, hand washing of staff and children, lighting and thermal environment, and hot water temperatures at sinks that are accessible to children.

Once an inspection is complete, the findings and results of the inspection are documented on the appropriate inspection form. The form is then reviewed with the owner / administrator, and a sanitation classification card is posted. The classification rating is posted in the facility in a conspicuous place designated by the Environmental Health Specialist. Child care centers are rated Superior, Approved, Provisional, or Disapproved based on a demerit-score grading system. The degree of the facility's compliance with sanitation standards are indicated by the total demerit-point score. The demerit- score point system is as follows:

Superior 0-15 Demerits
Approved 16-30 Demerits
Provisional 31-45 Demerits
Disapproved 46 or more Demerits

Any center which violates a critical six point item receives a provisional rating. When a center receives a provisional rating, another inspection is conducted within 7 days to determine if the critical item has been corrected. If it has been corrected, the provisional rating is changed to approved or superior. The provisional rating is changed to disapproved if the violation has not been corrected in the time allowed. Critical items that constitute a six point deduction include, but are not limited to: a violation of hot water temperatures for children, improper diapering methods, unapproved diaper changing facilities, improper storage of chemicals and medications, and wastewater disposal. Owners / administrators of child care centers may request a re-inspection for the purpose of raising their classification rating at any time.

Temporary Food Establishments

Temporary Food Establishments are required by North Carolina state law to obtain permits from this department prior to selling food. A temporary food establishment is an individual or organization that serves food or drink in connection with a fair, carnival, circus public exhibition, or other similar gathering. Event coordinators and vendors can download permit applications. Simply download the form here and either email it to maryc@duplincountync.com or mail it with all required attachments to our office at PO Box 948 Kenansville, NC 28349.

Event Coordinator Application | *Temporary Food Service Application* | *Temporary Food Service Supplemental Documents for Vendors* | *Non-profit Exempt Form* |

Complaint Investigations

The food & lodging section is responsible for investigating complaints received from the public against food and / or lodging establishments. To register a complaint, you may call (910) 296-2126.

Lead Investigations

Lead poisoning investigations are conducted when a child under six years of age has an elevated blood lead level. Blood lead testing is recommended for all children under six years of age for early detection. Investigations are used to attempt to find the source of lead in the child's environment. Several residences may be involved. When a source of lead is found, our department is responsible for monitoring remediation and/or abatement activities.

Food borne Disease Outbreak Investigations

Communicable diseases which may be spread by food are reported to our office for follow- up. If a large number of people become ill with a disease an investigation is conducted to try to determine the cause.

Plan Review

Plans, drawn to scale, and specifications, including the proposed menu, for new food service establishments must be submitted for review and approval to the local health department prior to initiating construction. The fee for this service is $200. Any changes in the dimensions of food preparation areas, seating capacity, or the addition of rooms to existing food service establishments must also be approved prior to renovating. Click Here for plan review information and application.

Mobile Food Unit / Pushcart Application

Water and Sewage Section

On-site evaluations/permits/inspections

This office conducts on-site evaluations of proposed home sites to determine the suitability of the soil for an on-site sewage disposal system. An application is made with this office for an improvements permit. A plot plan is required to be furnished, which indicates the size of the lot that is to be evaluated, the size and location of the proposed dwelling, the size and location of any adjacent structures and future development, and the location of any wells or existing septic systems.

The size of septic systems are based on the number of bedrooms in a dwelling, the number of employees in a business, and the number of seats in a restaurant or a church. This information must be furnished to this office when the application is made.

After the above information is obtained, personnel from this office then visit the site and make a site evaluation. When determining the site suitability, the following factors are

taken into account:

- Topography and landscape position: shape and slope of the lot (ex. hill or depression)
- Soil characteristics (morphology): texture-relative proportions of sand, silt, and clay size particles of the soil. The textures are arranged into four general groups containing twelve textural classes ranging from sand to clay.
- Structure: the arrangement of the soil particles
- Soil wetness conditions: location of the seasonal high water table or perched water table, and is determined by observation of colors of chromo 2 or less using the Munsell Color Chart.
- Soil depth: the amount of suitable soil before an unsuitable factor such as rock or saprolite.
- Restrictive horizons: soil that is capable of perching ground water or sewage effluent. They are commonly referred to as hard pans and usually found in areas like bays.
- Available space: amount of suitable soil that can be used for the septic system and repair area.

After the site evaluation is completed, a classification is given to the site. A suitable classification means that a conventional system can be installed with out any modifications to the site. A provisionally suitable classification means that an on-site system can be installed, with modifications being made to the site, or to the system design. An unsuitable classification means that a septic system cannot be installed to meet the required rules and regulations, and the site is denied a septic system permit.

After the lot has been classified by the above categories, a permit is either issued or denied. If a permit is issued, a diagram is provided to the applicant, along with the improvements permit, indicating exactly where the septic system should be installed.

A final inspection is required after the septic system installation is completed, so the operation permit can be issued and the system can be placed into use.

Sewage violations

Frequently this office is called to inspect possible violations of sewage disposal. These may range from kitchen waste being piped to an open ditch, to a direct discharge pipe from the septic tank or toilet to a ditch or yard. After making an inspection, and determining the validity of the complaint the appropriate action is taken. If the violations are not corrected in the specified amount of time, criminal warrants may be issued.

Well permitting

Duplin County is one of a growing number of counties in North Carolina that has a well ordinance. This means that all new well sites in the county must first be approved by this office. This helps to insure that wells are located the required setback distances from all sources of contamination and are constructed according the standards required by the state. After a well permit is obtained and the well has been drilled, the well contractor will contact this office for a grouting inspection. This inspection is to make sure that the well has been placed in the proper location, and to verify that the cement grout has been placed at the proper depth and mixed to the correct specifications.

Water sampling

Many residents of Duplin County depend on private wells for their water supply. Often times these people rely on this department to sample their water when there is an unexplained illness, the water tastes or smells bad, or as a requirement for a real estate transaction. Samples are collected by our office for a fee, and are analyzed by the

Environmental Sciences Section of the State Laboratory of Public Health in Raleigh. The most common samples that are taken are for bacterial and chemical analysis.

Bacterial sample: (Total and Fecal Coliform)

The Total Coliform test has for decades been considered the primary indicator of the bacteriological suitability for drinking water. The coliform group consists of four genera of bacteria-Enterobacter, Klebsiella, Citrobacter, and Eshericihia. The presence of Total Coliforms indicate that the water is unsafe to drink.

Fecal Coliform is a subgroup of Total Coliform and a term that is frequently used synonymously with E. Coli. The presence of Fecal Coliform bacteria indicates the recent introduction of bacteria from the intestinal tract of warm blooded animals. Anyone drinking water which is contaminated with Coliform Bacteria would also be at risk of ingesting any pathogenic organisms that may be present.

The chemical analysis tests for the levels of alkalinity, arsenic, calcium, chloride, copper, hardness, lead, iron, magnesium, manganese, pH, fluoride, zinc in the private water supply.

Phone Number:	(910) 296-2126
Address:	121 Middleton Cemetery Lane, Kenansville, NC 28349
Hours of Operation:	Monday through Friday 8:00 a.m. to 5:00 p.m.

Duplin County Notice of Privacy Practices

Welcome to QuickFacts

Duplin County, North Carolina

QuickFacts provides statistics for all states and counties, and for cities and towns with a population of 5,000 or more.

Skip to Footnotes | Skip to Flags

QuickFacts

People	Duplin County, North Carolina
Population	
Population estimates, July 1, 2015, (V2015)	59,159
Population estimates base, April 1, 2010, (V2015)	58,505
Population, percent change - April 1, 2010 (estimates base) to July 1, 2015, (V2015)	1.1%
Population, Census, April 1, 2010	58,505
Age and Sex	
Persons under 5 years, percent, July 1, 2015, (V2015)	6.5%
Persons under 5 years, percent, April 1, 2010	7.3%
Persons under 18 years, percent, July 1, 2015, (V2015)	24.5%
Persons under 18 years, percent, April 1, 2010	25.4%
Persons 65 years and over, percent, July 1, 2015, (V2015)	16.5%
Persons 65 years and over, percent, April 1, 2010	14.2%
Female persons, percent, July 1, 2015, (V2015)	51.0%
Female persons, percent, April 1, 2010	50.8%
Race and Hispanic Origin	
White alone, percent, July 1, 2015, (V2015) (a)	70.2%
White alone, percent, April 1, 2010 (a)	57.2%
Black or African American alone, percent, July 1, 2015, (V2015) (a)	25.9%
Black or African American alone, percent, April 1, 2010 (a)	25.3%
American Indian and Alaska Native alone, percent, July 1, 2015, (V2015) (a)	1.4%
American Indian and Alaska Native alone, percent, April 1, 2010 (a)	0.5%
Asian alone, percent, July 1, 2015, (V2015) (a)	0.7%
Asian alone, percent, April 1, 2010 (a)	0.3%
Native Hawaiian and Other Pacific Islander alone, percent, July 1, 2015, (V2015) (a)	0.4%
Native Hawaiian and Other Pacific Islander alone, percent, April 1, 2010 (a)	0.1%
Two or More Races, percent, July 1, 2015, (V2015)	1.4%
Two or More Races, percent, April 1, 2010	1.6%
Hispanic or Latino, percent, July 1, 2015, (V2015) (b)	21.7%
Hispanic or Latino, percent, April 1, 2010 (b)	20.6%
White alone, not Hispanic or Latino, percent, July 1, 2015, (V2015)	51.8%
White alone, not Hispanic or Latino, percent, April 1, 2010	52.9%
Population Characteristics	

Veterans, 2010-2014	4,078
Foreign born persons, percent, 2010-2014	12.1%
Housing	
Housing units, July 1, 2015, (V2015)	25,466
Housing units, April 1, 2010	25,728
Owner-occupied housing unit rate, 2010-2014	67.0%
Median value of owner-occupied housing units, 2010-2014	$86,000
Median selected monthly owner costs -with a mortgage, 2010-2014	$1,045
Median selected monthly owner costs -without a mortgage, 2010-2014	$367
Median gross rent, 2010-2014	$626
Building permits, 2015	36
Families and Living Arrangements	
Households, 2010-2014	22,027
Persons per household, 2010-2014	2.66
Living in same house 1 year ago, percent of persons age 1 year+, 2010-2014	87.6%
Language other than English spoken at home, percent of persons age 5 years+, 2010-2014	19.0%
Education	
High school graduate or higher, percent of persons age 25 years+, 2010-2014	71.4%
Bachelor's degree or higher, percent of persons age 25 years+, 2010-2014	10.4%
Health	
With a disability, under age 65 years, percent, 2010-2014	10.9%
Persons without health insurance, under age 65 years, percent	⚠ 23.2%
Economy	
In civilian labor force, total, percent of population age 16 years+, 2010-2014	60.1%
In civilian labor force, female, percent of population age 16 years+, 2010-2014	52.2%
Total accommodation and food services sales, 2012 ($1,000) (c)	44,098
Total health care and social assistance receipts/revenue, 2012 ($1,000) (c)	133,211
Total manufacturers shipments, 2012 ($1,000) (c)	2,056,739
Total merchant wholesaler sales, 2012 ($1,000) (c)	473,125
Total retail sales, 2012 ($1,000) (c)	466,370
Total retail sales per capita, 2012 (c)	$7,769
Transportation	
Mean travel time to work (minutes), workers age 16 years+, 2010-2014	24.5
Income and Poverty	
Median household income (in 2014 dollars), 2010-2014	$34,787
Per capita income in past 12 months (in 2014 dollars), 2010-2014	$17,677
Persons in poverty, percent	⚠ 27.7%

Businesses	Duplin County, North Carolina
Total employer establishments, 2014	817
Total employment, 2014	12,847
Total annual payroll, 2014	384,282
Total employment, percent change, 2013-2014	4.1%
Total nonemployer establishments, 2014	3,157
All firms, 2012	3,486
Men-owned firms, 2012	2,041

Women-owned firms, 2012	1,127
Minority-owned firms, 2012	997
Nonminority-owned firms, 2012	2,392
Veteran-owned firms, 2012	387
Nonveteran-owned firms, 2012	2,967

Geography	Duplin County, North Carolina
Population per square mile, 2010	71.7
Land area in square miles, 2010	816.22
Metropolitan or Micropolitan Statistical Area	None
FIPS Code	37061

Export to CSV Export to Excel

This geographic level of poverty and health estimates are not comparable to other geographic levels of these estimates

Some estimates presented here come from sample data, and thus have sampling errors that may render some apparent differences between geographies statistically indistinguishable. Click the Quick Info icon to the left of each row in TABLE view to learn about sampling error.

The vintage year (e.g., V2015) refers to the final year of the series (2010 thru 2015).
Different vintage years of estimates are not comparable.

(a) Includes persons reporting only one race
(b) Hispanics may be of any race, so also are included in applicable race categories
(c) Economic Census - Puerto Rico data are not comparable to U.S. Economic Census data

D Suppressed to avoid disclosure of confidential information
F Fewer than 25 firms
FN Footnote on this item in place of data
NA Not available
S Suppressed; does not meet publication standards
X Not applicable
Z Value greater than zero but less than half unit of measure shown

Up one level

North Carolina

QuickFacts data are derived from: Population Estimates, American Community Survey, Census of Population and Housing, Current Population Survey, Small Area Health Insurance Estimates, Small Area Income and Poverty Estimates, State and County Housing Unit Estimates, County Business Patterns, Nonemployer Statistics, Economic Census, Survey of Business Owners, Building Permits.

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Governments
Local Employment Dynamics
Survey of Business Owners

PEOPLE & HOUSEHOLDS
2020 Census
2010 Census
American Community Survey
Income
Poverty
Population Estimates
Population Projections
Health Insurance
Housing
International
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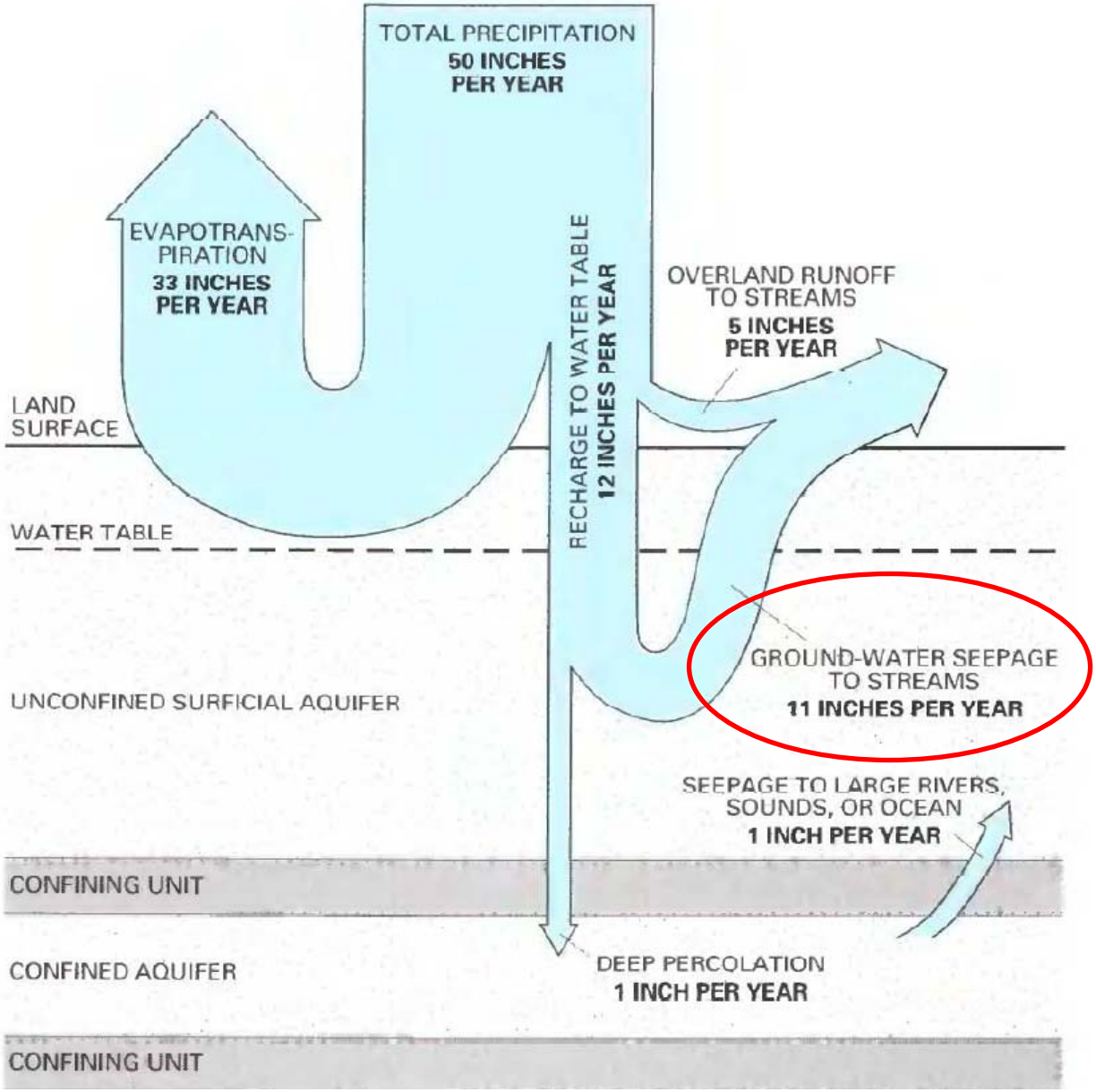
Rule Making Petition – Division Response

- Interaction of Ground Waters and Surface Waters
- Evaluation of Existing Non-discharge Data
- Review of Technical Issues
- Overview of Proposed Rules

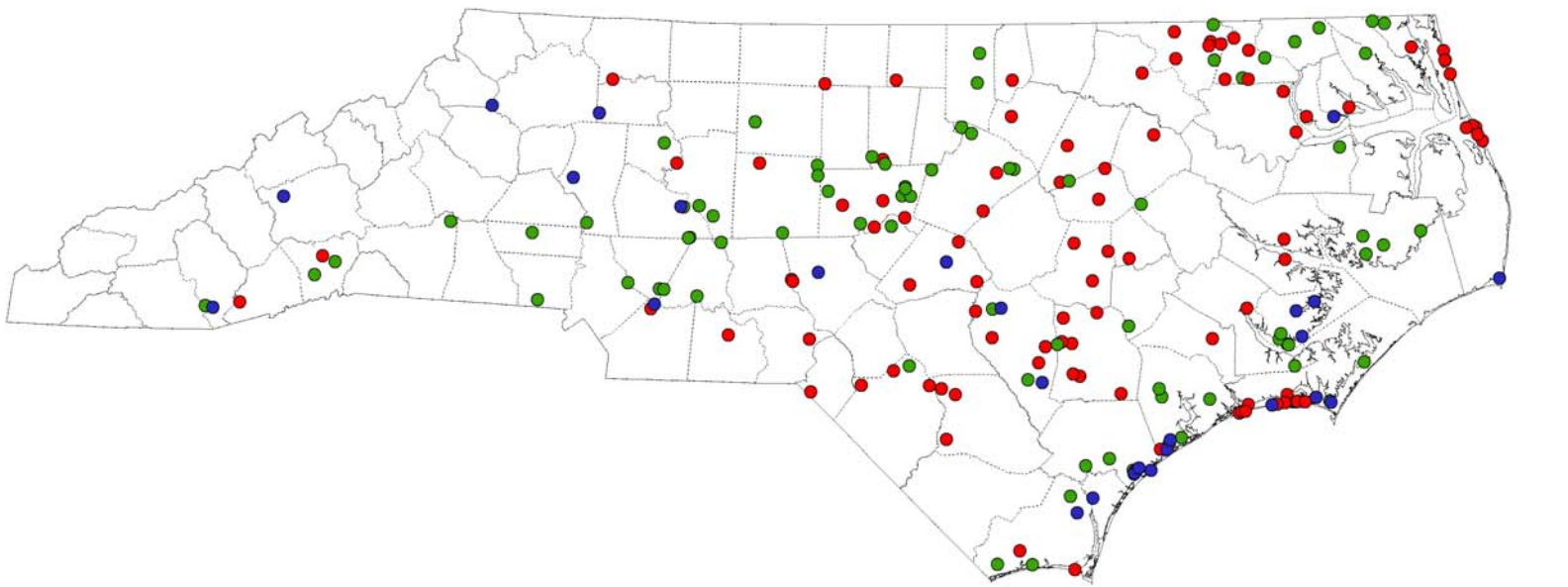
EPA-HQ-2017-00797 E-Files 000195 Wk of 2019-07-29



EPA-HQ-2017-00797 E-Files 000196 Wk of 2019-07-29

Giese, G.L., Eimers, J.L., and Coble, R.W., 1997, Simulation of ground-water flow in the Coastal Plain aquifer system of North Carolina USGS Professional Paper 1404-M

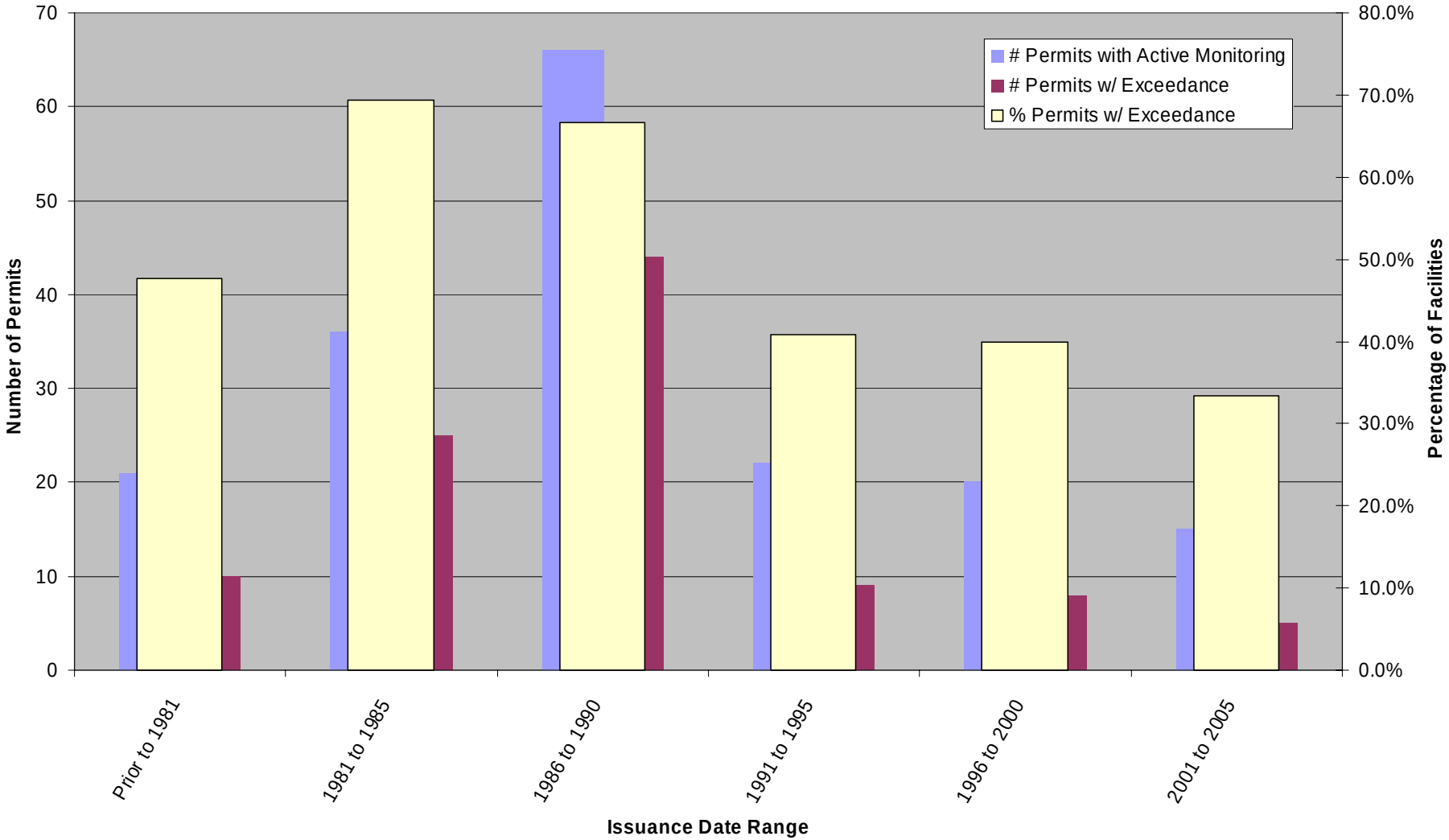
Non-Discharge Wastewater Facility Groundwater Nitrate Monitoring



Legend

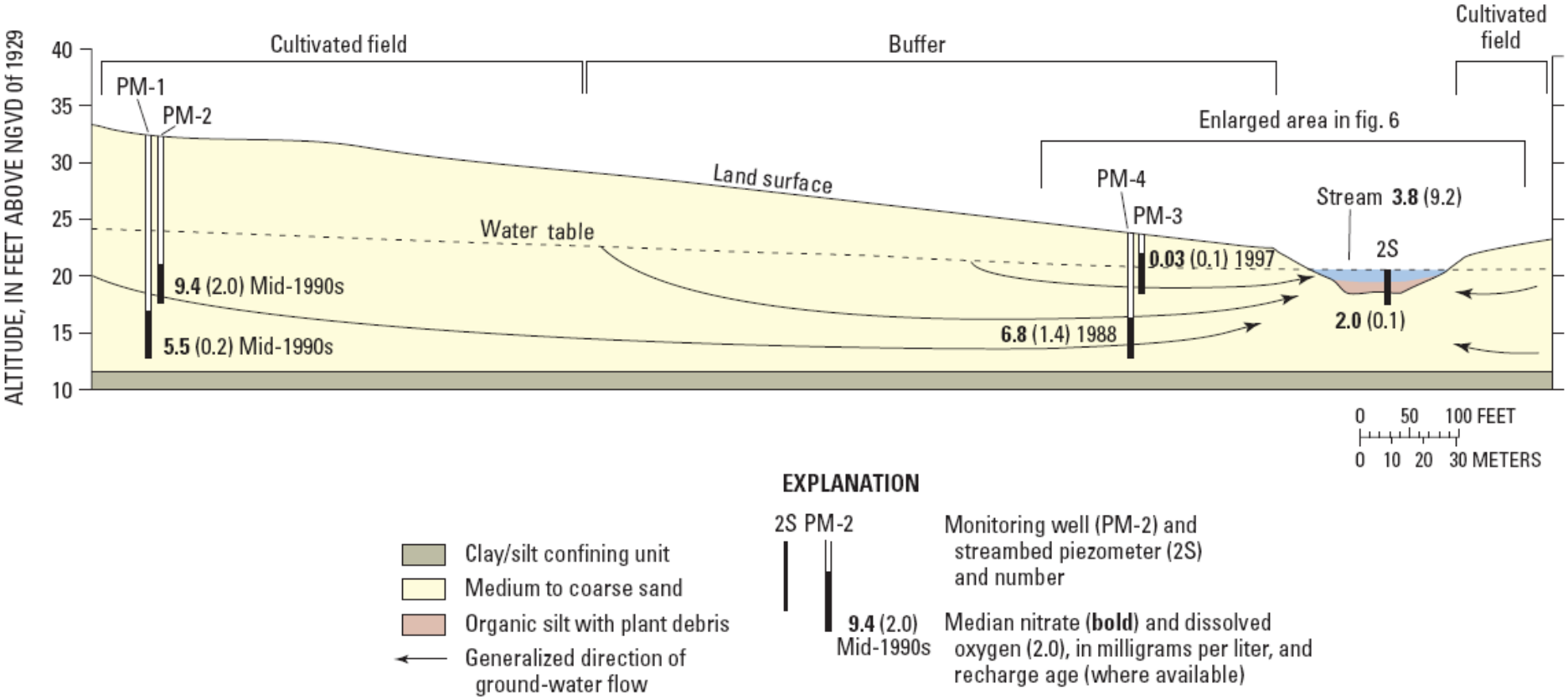
- Monitoring data exceeds 10ppm NO3
- Monitoring data less than 10ppm NO3
- Yet to submit data

Percentage of Non-discharge Wastewater Facilities with Nitrate Values > 10 ppm



Source: Basinwide Information Management System

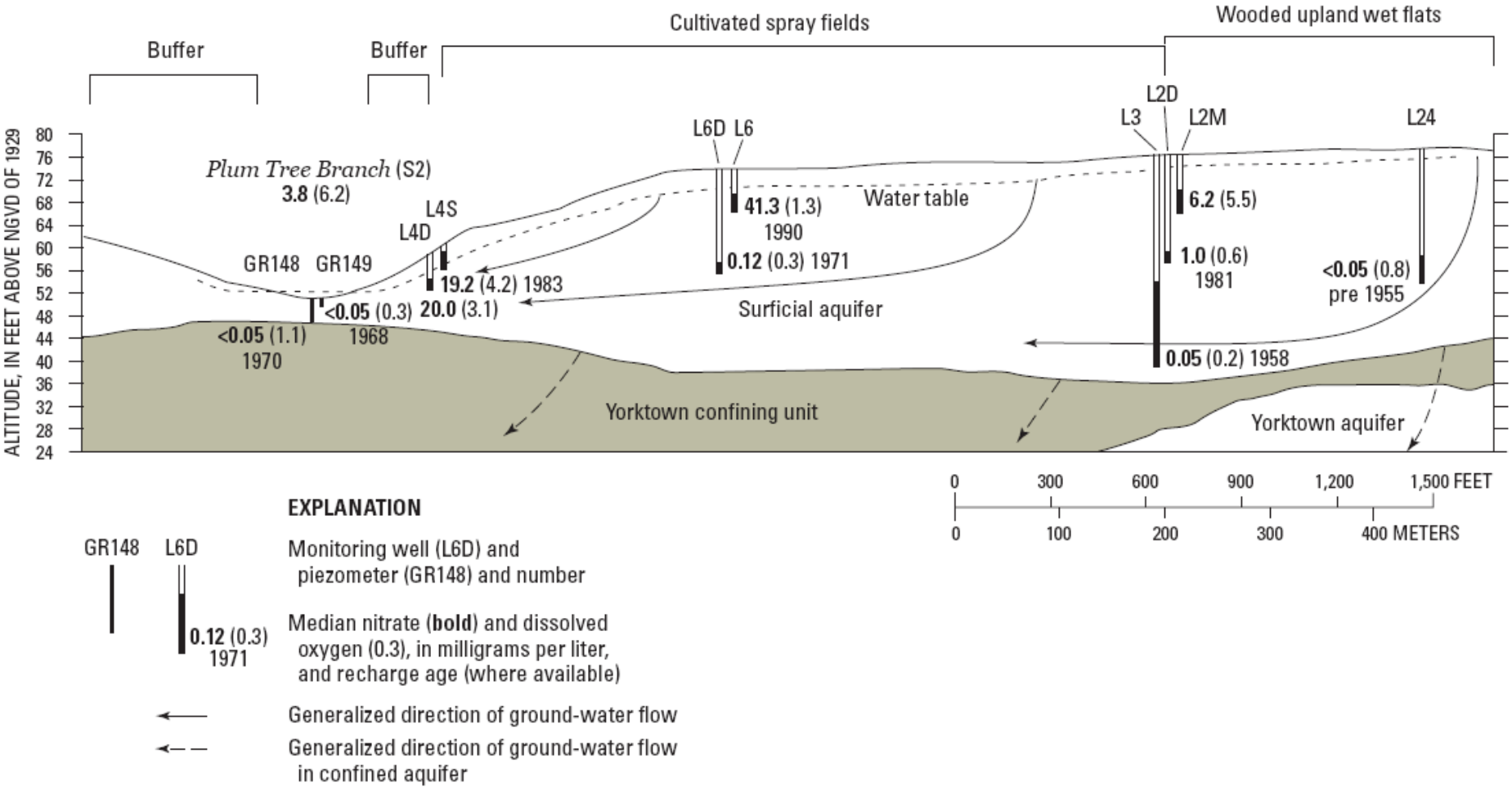
Cross Section of Surficial Aquifer



Harden, S.L., and Spruill, T.B., 2008 Factors Affecting Nitrate Delivery to Streams From Shallow Ground Water in the NC Coastal Plain, USGS SIR 2008-5021

EPA-HQ-2017-00797-E-Files-000199 Wk of 2019-07-29

Cross Section of Surficial Aquifer



Harden, S.L., and Spruill, T.B., 2008 Factors Affecting Nitrate Delivery to Streams From Shallow Ground Water in the NC Coastal Plain, USGS SIR 2008-5021

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Proposed Monitoring Rule – 2T .1310

- Surface Water Monitoring
  - Waste Discharge Monitoring
  - Routine Monitoring
- Monitoring Coalitions
- Groundwater Monitoring
- Reporting (annual)

EPA-HQ-2017-00797 E-Files 000201 Wk of 2019-07-29

Waste Discharge Monitoring

- Based on Current NPDES General Permit Requirements
- New Visual Observations for Subsurface Drains
- Two Visual Observations Per Year
  - One after land application
  - One after land application and subsequent rainfall event
- Take Samples If Needed

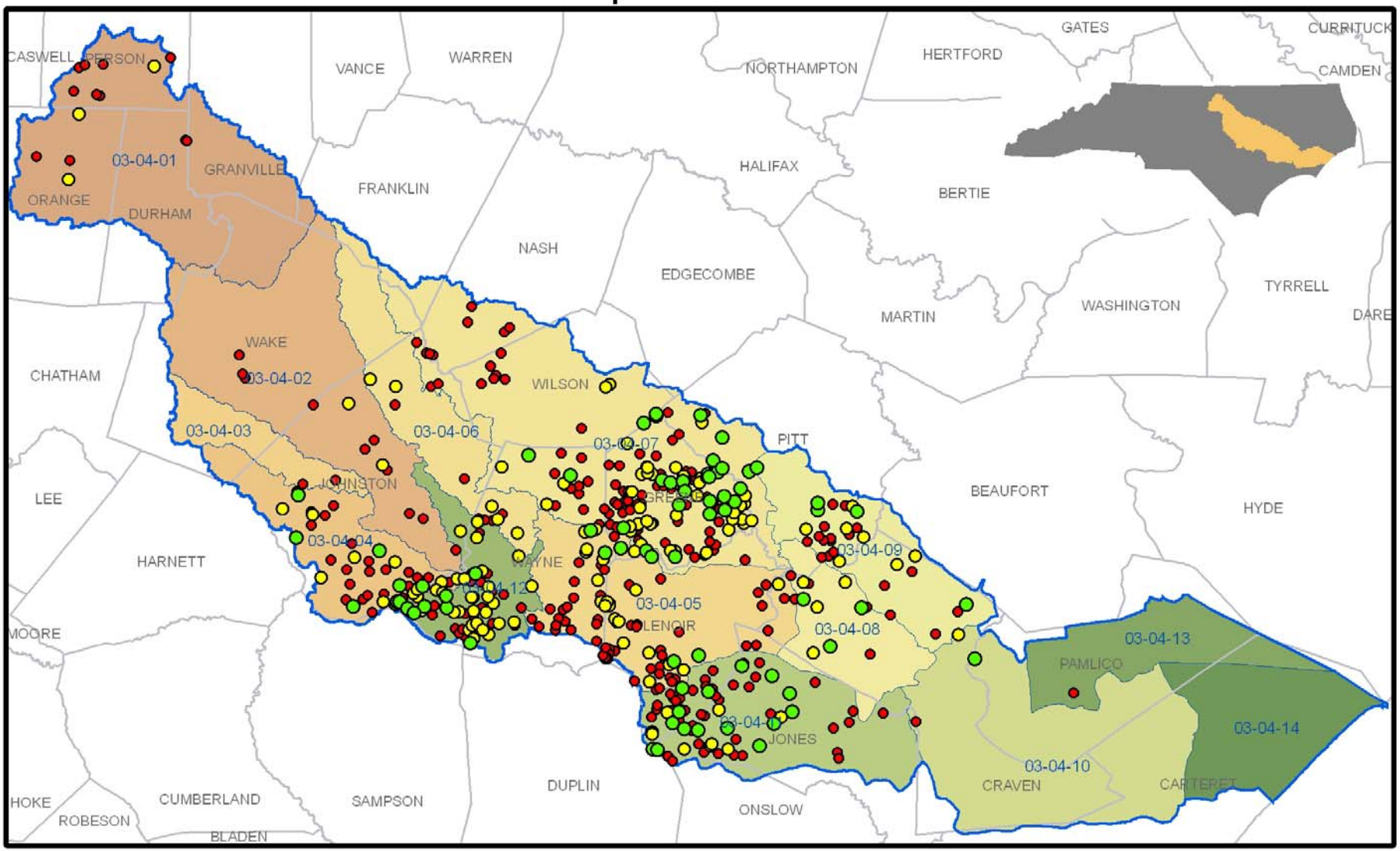
EPA-HQ-2017-00797 E-Files 000202 Wk of 2019-07-29

Routine Surface Water Monitoring

- General Criteria Provided
- Site by Site Evaluation
- Rule Gives Basis for Decisions
- Implementation Schedule in Rule .1311
- Monitoring Coalitions (optional)

EPA-HQ-2017-00797 E-Files 000203 Wk of 2019-07-29

Permitted Active Animal Operations in the Neuse River Basin



Legend

- Facilities Reporting Subsurface Drains
- Facilities With Poorly Draining Soils
- Facilities Not Reporting Subsurface Drains

0 5 10 20 30 40 Miles

N W E S

EPA-HQ-2017-00797 E-Files 000204 Wk of 2019-07-29

Routine Surface Water Monitoring

- Increase or Decrease (including elimination) Monitoring
- Based on Results and Other Available Data
  - From on-site data
  - Based on applicable data of BMPs, buffers

EPA-HQ-2017-00797 E-Files 000205 Wk of 2019-07-29

Groundwater Monitoring

- Reflects Current Policy
- Risk Based
- Monitoring Changes Similar to SW

EPA-HQ-2017-00797 E-Files 000200 Wk of 2019-07-29

Proposed Implementation Rule – 2T .1311

- Notification to Submit Plan
- Rule Provides Basis
- Emphasis
  - Nutrient impaired watersheds
  - Presence of drains, ditches, etc.
  - Lack of riparian buffers
  - Number of operations in basin
- Flexibility to Adjust Priorities

EPA-HQ-2017-00797 E-Files 000207 Wk of 2019-07-29

Division Recommendation

The Division recommends granting the petition by initiating the rule making process with the Division proposed rules 15A NCAC 02T .1310 and 15A NCAC 02T .1311.

EPA-HQ-2017-00797 E-Files 000208 Wk of 2019-07-29

STATE OF NORTH CAROLINA
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF WATER RESOURCES

FACT SHEET ON RENEWAL OF ANIMAL WASTE MANAGEMENT SYSTEM STATE GENERAL PERMITS

Date: October 22, 2013

1. TYPES OF OPERATIONS COVERED

A. Activities Covered by this General Permit

On the basis of an advisory work group, thorough staff review and application of Article 21 of Chapter 143, General Statutes of North Carolina, North Carolina Administrative Code (NCAC) 15A 2T Section .1300, and other lawful standards and regulations, the North Carolina Environmental Management Commission proposes to renew, with modification, the Non-Discharge General Permits for animal waste operations. It is proposed that these General Permits be revised for the following operations:

General Permit AWG100000 - Swine Operations
General Permit AWG200000 - Cattle and Dairy Operations
General Permit AWG300000 - Poultry Operations

B. Geographic Area(s) Covered by these General Permits

Animal waste operations covered by these General Permits are located within the political boundary of the State of North Carolina.

C. Types of Wastewater Produced

"Animal waste" will consist of livestock or poultry excreta or a mixture of excreta with feed, bedding, litter, or other materials from an animal operation. (GS 143-215.10B), (15A NCAC 2T .0103)

D. Description of Typical Treatment Facilities.

The animal waste management systems covered by these permits include some type of collection (flush, pit recharge, scraped lots, etc) with transmission ditches or pipes, lagoons or ponds to collect, treat and store the waste, irrigation equipment and sufficient acreage for application of the animal waste at agronomic rates. Animal waste is usually applied by using permanent or mobile pumps and piping to traveling gun reel systems but could also use a solid set irrigation system, a transportation and application vehicle system such as a honey wagon, and other forms of application systems for the animal waste.

EPA-HQ-2017-00797 E-Files 000209 Wk of 2019-07-29

2. BASIS FOR RENEWAL OF THE GENERAL PERMITS

The basis of the renewal of the animal waste general permits is that the existing general permits expire on September 30, 2014. NCAC 15A 2T .1300 authorizes the operation of the animal waste management systems in this State. The United States Department of Agriculture, Natural Resource Conservation Service (NRCS) has also developed a series of minimum standards and specifications for animal waste management practices. The NRCS Standards have been adopted by reference in 15A NCAC 2T .1304 (b)(1). The Draft General Permits contain many of the requirements currently contained in the existing state Non-Discharge General Permits for animal operations. Differences however include but are not limited to elimination of obsolete conditions, updating general statute and NRCS Standards citations, and technical corrections for clarification. Some of the key differences are as follows:

- Soil sampling must be conducted at least once every three years on animal waste land application fields.
- Clarified that waste samples for analysis are to be representative of the waste as it is to be applied – i.e., if lagoon is agitated for waste application, then the sample should be taken when agitated rather than prior to agitation.
- Incorporated the requirement to submit a 5-Day Plan of Action to drop waste levels below the structural freeboard threshold.
- For AWG200000 – Cattle and Dairy Operations ONLY – facilities below permitting threshold for three years or more are allowed to request permit rescission prior to closure of waste lagoons/containment basins.
- Distribution of animal waste for personal use is limited to ten cubic yards per year.

The Division held two stakeholder meetings that included representatives of swine, cattle and poultry farmers, representatives of environmental protection and natural resources conservation groups, and other interested parties. These stakeholder meetings were conducted to provide input into the development of the revised Draft General Permits. The information provided through the stakeholder process was a key factor in the development of the current Draft General Permits.

Individual Permits will be required of facilities when coverage under a General Permit is not appropriate.

3. THE ADMINISTRATIVE RECORD

The administrative record, including draft permits, fact sheet, and additional information is available for review and copying at the Division of Water Resources, Archdale Building – Room 640-P, 512 N. Salisbury St., Raleigh, North Carolina 27604 between the hours of 8:00 a.m. and 5:00 p.m. Monday through Friday.

Copies of the Draft General Permits and Fact Sheet are at:

http://portal.ncdenr.org/web/wq/aps/afo

EPA-HQ-2017-00797 E-Files 000210 Wk of 2019-07-29

A copy of the draft animal waste General Permits and fact sheets are also available by writing or calling:

Christine B. Lawson
Animal Feeding Operations Unit
NC Division of Water Resources
1636 Mail Service Center
Raleigh, North Carolina 27699-1636
Telephone number: (919) 807-6354

Paper copies of the administrative record will be provided at a charge of 10 cents per page.

4. PROPOSED SCHEDULE FOR ANIMAL WASTE GENERAL PERMITS

Draft General Permits to public notice: October 28, 2013
General Permits scheduled issuance date: October 1, 2014

5. EFFECTIVE DATE AND LENGTH OF THE GENERAL PERMIT

The general permits will have an effective date of October 1, 2014 and remain effective for a period of five years. Each facility will be covered under an animal waste general permit by issuance of a certificate of coverage.

Comment Period

The comment period for these draft General Permits will last until December 6, 2013. All comments received prior to that date will be considered in the formulation of final determinations with regard to these General Permits. Interested persons are invited to submit written comments on the proposed General Permits to the address below. All comments and requests regarding this matter should make reference to permit numbers AWG100000, AWG200000, and/or AWG300000.

NC Division of Water Resources
Animal Feeding Operations Unit
1636 Mail Service Center
Raleigh, NC 27699-1636

EPA-HQ-2017-00797 E-Files 000211 Wk of 2019-07-29

FORM

Approved by OMB: No. 2030-0020 Expires 04-30-2012

Sent to OCR: 9-3-2014

Preaward Compliance Review Report for All Applicants and Recipients Requesting EPA Financial Assistance

Note: Read instructions on other side before completing form.

I. Applicant/Recipient (Name, Address, State, Zip Code).

NC Dept of Env. and Natural Resources, 1601 Mail Service Center, Raleigh, NC 27699

DUNS No. 809785280

II. Is the applicant currently receiving EPA assistance?

Yes

III. List all civil rights lawsuits and administrative complaints pending against the applicant/recipient that allege discrimination based on race, color, national origin, sex, age, or disability. (Do not include employment complaints not covered by 40 C.F.R. Parts 5 and 7. See instructions on reverse side.)

see attached sheet

IV. List all civil rights lawsuits and administrative complaints decided against the applicant/recipient within the last year that allege discrimination based on race, color, national origin, sex, age, or disability and enclose a copy of all decisions. Please describe all corrective action taken. (Do not include employment complaints not covered by 40 C.F.R. Parts 5 and 7. See instructions on reverse side.)

none

V. List all civil rights compliance reviews of the applicant/recipient conducted by any agency within the last two years and enclose a copy of the review and any decisions, orders, or agreements based on the review. Please describe any corrective action taken. (40 C.F.R. § 7.80(c)(3))

none

VI. Is the applicant requesting EPA assistance for new construction? If no, proceed to VII; if yes, answer (a) and/or (b) below.

Yes ✓ No

a. If the grant is for new construction, will all new facilities or alterations to existing facilities be designed and constructed to be readily accessible to and usable by persons with disabilities? If yes, proceed to VII; if no, proceed to VI(b). Yes No

b. If the grant is for new construction and the new facilities or alterations to existing facilities will not be readily accessible to and usable by persons with disabilities, explain how a regulatory exception (40 C.F.R. § 7.70) applies. Yes No

VII.* Does the applicant/recipient provide initial and continuing notice that it does not discriminate on the basis of race, color, national origin, sex, age, or disability in its programs or activities? (40 C.F.R. § 5.140 and § 7.95) ✓ Yes No

a. Do the methods of notice accommodate those with impaired vision or hearing? ✓ Yes No

b. Is the notice posted in a prominent place in the applicant's offices or facilities or, for education programs and activities, in appropriate periodicals and other written communications? ✓ Yes No

c. Does the notice identify a designated civil rights coordinator? ✓ Yes No

VIII.* Does the applicant/recipient maintain demographic data on the race, color, national origin, sex, age, or handicap of the population it serves? (40 C.F.R. § 7.85(a)) Yes

IX.* Does the applicant/recipient have a policy/procedure for providing access to services for persons with limited English proficiency? (40 C.F.R. Part 7, E.O. 13166) Yes

X.* If the applicant/recipient is an education program or activity, or has 15 or more employees, has it designated an employee to coordinate its compliance with 40 C.F.R. Parts 5 and 7? Provide the name, title, position, mailing address, e-mail address, fax number, and telephone number of the designated coordinator. see attached sheet

XI* If the applicant/recipient is an education program or activity, or has 15 or more employees, has it adopted grievance procedures that assure the prompt and fair resolution of complaints that allege a violation of 40 C.F.R. Parts 5 and 7? Provide a legal citation or Internet address for, or a copy of, the procedures. see attached sheet

For the Applicant/Recipient

I certify that the statements I have made on this form and all attachments thereto are true, accurate and complete. I acknowledge that any knowingly false or misleading statement may be punishable by fine or imprisonment or both under applicable law. I assure that I will fully comply with all applicable civil rights statutes and EPA regulations.

A. Signature of Authorized Official	B. Title of Authorized Official	C. Date
[signature]	EEO Officer	8/22/14

For the U.S. Environmental Protection Agency

I have reviewed the information provided by the applicant/recipient and hereby certify that the applicant/recipient has submitted all preaward compliance information required by 40 C.F.R. Parts 5 and 7; that based on the information submitted, this application satisfies the preaward provisions of 40 C.F.R. Parts 5 and 7; and that the applicant has given assurance that it will fully comply with all applicable civil rights statutes and EPA regulations.

A. Signature of Authorized EPA Official	B. Title of Authorized EPA Official	C. Date
See ** note on reverse side		

EPA Form 4700-4 (Rev. 04/2009). Previous editions are obsolete.

Attachment to Preaward Compliance Review Report for

All Applicants and Recipients Requesting EPA Financial Assistance

III.

Disability: 435-2014-00427

Race (2 cases): 433-2013-01103, 433-2014-01883

X.

Paul Harrell, EEO Officer, 1607 MSC Raleigh, NC 27699-1607, paul.harrell@ncdenr.gov, fax/phone - 919-707-8304

XI.
http://www.oshr.nc.gov/Guide/Policies/7_Discipline,%20Appeals%20and%20Grievances/Employee%20Grievance%20Policy.pdf

NORTH CAROLINA
ENVIRONMENTAL MANAGEMENT COMMISSION
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

SWINE WASTE MANAGEMENT SYSTEM GENERAL PERMIT

This General Permit is issued pursuant to North Carolina General Statutes 143-215 et seq., may apply to any swine facility in the State of North Carolina, and shall be effective from October 1, 2009 until September 30, 2014.

All activities authorized herein shall be consistent with the terms and conditions of this General Permit.

Holders of Certificates of Coverage (COC) under this General Permit shall comply with the following specified conditions and limitations.

I. PERFORMANCE STANDARDS

1. Any discharge of waste that reaches surface waters or wetlands is prohibited except as otherwise provided in this General Permit and associated statutory and regulatory provisions. Waste shall not reach surface waters or wetlands by runoff, drift, manmade conveyance, direct application, direct discharge or through ditches, terraces, or grassed waterways not otherwise classified as state waters.

   The waste collection, treatment, storage and application system operated under this General Permit shall be effectively maintained and operated as a non-discharge system to prevent the discharge of pollutants to surface waters or wetlands. Application of waste to terraces and grassed waterways is acceptable as long as it is applied in accordance with Natural Resources Conservation Service (NRCS) Standards and does not result in a discharge of waste to surface waters or wetlands.

   Facilities must be designed, constructed, operated, and maintained to contain all waste plus the runoff from a 25-year, 24-hour rainfall event for the location of the facility. A facility that has a discharge of waste that results because of a storm event more severe than the 25-year, 24-hour storm will not be considered to be in violation of this General Permit if the facility is otherwise in compliance with its Certified Animal Waste Management Plan (CAWMP) and this General Permit.

   Any discharge or application of waste to a ditch that drains to surface waters or wetlands is prohibited except as follows: (a) discharges from the ditches are controlled by best management practices (BMPs) designed in accordance with NRCS standards; (b) the BMPs have been submitted to and approved by the Division of Water Quality (Division); (c) the BMPs were implemented as designed to prevent a discharge to surface waters or wetlands; (d) the waste was removed immediately from the ditch upon discovery; and (e) the event was documented and reported in accordance with Part III.13. of this General Permit. Nothing in this exception shall excuse a discharge to surface waters or wetlands except as may result because of rainfall from a storm event more severe than the 25-year, 24-hour storm.

2. This Permit does not allow the Permittee to cause a violation of any of the water quality standards established pursuant to Title 15A, Subchapter 2B of the North Carolina Administrative Code and Title 15A, Subchapter 2L of the North Carolina Administrative Code.

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3. The facility's COC and its CAWMP are hereby incorporated by reference into this General Permit. The CAWMP must be consistent with all applicable laws, rules, ordinances, and standards (federal, state and local) in effect at the time of siting, design and certification of the facility.

   The Permittee must assess and record, on an ongoing basis, the effectiveness of the implementation of the CAWMP. The Permittee must make "major changes," "revisions," or "amendments" to the CAWMP, as defined in Section VII, "Definitions," of this Permit, in order to address any changes needed to maintain compliance with the facility's COC and this General Permit. "Major changes," "revisions," and "amendments" to the CAWMP must be documented, dated, and included as part of the CAWMP. "Major changes " and "revisions" to the CAWMP shall be submitted to the appropriate Division Regional Office within thirty (30) calendar days of the "major change" or "revision." "Amendments" are not required to be submitted to the Division Regional Office unless specifically requested by the Division. If field, riser or pull numbers are changed, an explanation shall also be submitted and include a description of how the new numbers relate to the old numbers.

   Any violation of the COC or the CAWMP shall be considered a violation of this General Permit and subject to enforcement actions. A violation of this General Permit may result in the Permittee having to take immediate or long-term corrective action(s) as required by the Division. These actions may include but are not limited to: modifying the CAWMP; ceasing land application of waste; removing animals from the facility; or the COC being reopened and modified, revoked and reissued, and/or terminated.

4. Any proposed increase or modification to the annual average design capacity from that authorized by the COC will require a modification to the CAWMP and the COC prior to modification of the facility. All new and expanding operations must demonstrate that waste management system will satisfy the requirements of G.S. §143-215.10.I. No collection, treatment or storage facilities may be constructed in a 100-year flood plain.

5. Facilities located in watersheds sensitive to nutrient enrichment may be notified by the Division to conduct an evaluation of the facility and its CAWMP to determine the facility's ability to comply with the NRCS nutrient management standard as it relates to phosphorous. This evaluation will not be required until such time as the permittee is notified by the Division. The evaluation must be documented on forms supplied by or approved by the Division and must be submitted to the Division. This evaluation must be completed by existing facilities within twelve (12) months of receiving notification from the Division.

   For facilities located in watersheds sensitive to nutrient enrichment, all fields with a "HIGH" phosphorous-loss assessment rating shall have land application rates that do not exceed the established crop removal rate for phosphorous. There shall be no waste application on fields with a "VERY HIGH" phosphorous-loss assessment rating.

6. If prior approval is received from the Director of the Division of Water Quality (Director), facilities that have been issued a COC to operate under this General Permit may add treatment units for the purpose of removing pollutants before the waste is discharged into the lagoons/storage ponds. Prior to any approval, the Permittee must demonstrate to the satisfaction of the Director that the new treatment unit will not interfere with the operation of the existing treatment system and that a process is in place to properly manage and track the pollutants removed.

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7. If prior approval is received from the Director, facilities that have been issued a COC to operate under this General Permit may add innovative treatment processes to the systems on a pilot basis in order to determine if the innovative treatment process will improve how the waste is treated and/or managed. Prior to any approval, the Permittee must demonstrate to the satisfaction of the Director that the innovative treatment process will not interfere with the operation of the existing treatment system and that a process is in place to properly manage and track the pollutants removed.

8. Animal waste shall not be applied within 100 feet of any well with the exception of monitoring wells. The allowable distance to monitoring wells shall be established on a case-by-case basis by the Division.

9. Existing swine dry lots may remain in wetlands as long as the wetlands uses are not removed or degraded as a result of the swine. The swine however may not be confined within 100 feet of an adjacent surface water or a seasonally-flooded area. The swine also must not cause a loss of more than 10% of the existing tree canopy. Where trees do not exist, the area must be managed to include crop rotation.

II. OPERATION AND MAINTENANCE REQUIREMENTS

1. The collection, treatment, and storage facilities, and the land application equipment and fields shall be properly operated and maintained at all times.

2. A vegetative cover shall be maintained as specified in the facility's CAWMP on all land application fields and buffers in accordance with the CAWMP. No waste shall be applied upon areas not included in the CAWMP or upon areas where the crop is insufficient for nutrient utilization. However, if the CAWMP allows, then waste may be applied up to thirty (30) days prior to planting or breaking dormancy.

3. Soil pH on all land application fields must be maintained in the optimum range for crop production.

4. Land application rates shall be in accordance with the CAWMP. In no case shall land application rates exceed the agronomic rate of the nutrient of concern for the receiving crop.

5. In no case shall land application rates result in excessive ponding or any runoff during any given application event.

6. Animal waste shall not be directly applied onto crops for direct human consumption that do not undergo further processing (e.g., strawberries, melons, lettuce, cabbage, apples, etc.) at any time during the growing season, or in the case of fruit bearing trees, following breaking dormancy. Application of animal wastes shall not occur within thirty (30) days of the harvesting of fiber and food crops for direct human consumption that undergoes further processing.

7. If manure or sludges are applied on conventionally tilled bare soil, the waste shall be incorporated into the soil within two (2) days after application on the land, or prior to the next rainfall event, whichever occurs first. This requirement does not apply to no-till fields, pastures, or fields where crops are actively growing.

8. No material other than animal wastes of the type generated on this facility shall be disposed of in the animal waste collection, treatment, storage, or application systems. This includes but is not limited to pesticides, toxic chemicals and petroleum products.

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9. Domestic and/or industrial wastewater from showers, toilets, sinks, etc. shall not be discharged into the animal waste collection, treatment, storage, and application system. Washdown of stock trailers owned by and used to transport animals to and from the facility only, will be permissible as long as the system has been evaluated and approved to accommodate the additional volume. Only those cleaning agents and soaps that are EPA approved according to their label, will not harm the cover crop, and will not contravene the groundwater standards listed in 15A NCAC 2L may be utilized in facilities covered by this General Permit. Instruction labels are to be followed when using cleaning agents and soaps.

10. Disposal of dead animals resulting from normal mortality rates associated with the facility shall be done in accordance with the facility's CAWMP and the North Carolina Department of Agriculture and Consumer Services (NCDA&CS) Veterinary Division's Statutes and regulations.

    Disposal of dead animals whose numbers exceed normal mortality rates associated with the facility shall also be done in accordance with the facility's CAWMP and NCDA&CS Veterinary Division's Statutes and regulations provided that: 1) burial of such animals shall be done in consultation with the State Veterinarian of the NCDA&CS Veterinary Division's Statutes and in compliance with NCDA&CS regulations; 2) all such burial sites must be mapped, and the dates and numbers of the animals buried by species and type must be recorded; and 3) the map is submitted to the appropriate Regional Office Aquifer Protection Section within fifteen (15) calendar days of burial.

    In the event of a state of emergency declared by the Governor, disposal of dead animals shall be done in accordance with requirements and guidelines dictated by the State Veterinarian according G.S. §106-339.4. The Division may require groundwater monitoring when there is massive burial of animals. All burial sites of such animals must be mapped, and the dates and numbers of the animals buried by species and type must be recorded.

11. Unless accounted for in temporary storage volume, all uncontaminated runoff from the surrounding property and buildings shall be diverted away from the waste lagoons/storage ponds to prevent any unnecessary addition to the liquid volume in the structures.

12. A protective vegetative cover shall be established and maintained on all earthen lagoon/storage pond embankments (outside toe of embankment to maximum pumping elevation), berms, pipe runs, and diversions to surface waters or wetlands. Trees, shrubs, and other woody vegetation shall not be allowed to grow on the lagoon/storage pond embankments. All trees shall be removed in accordance with good engineering practices. Lagoon/storage pond areas shall be accessible, and vegetation shall be kept mowed.

13. At the time of sludge removal from a lagoon/storage pond, the sludge must be managed in accordance with the CAWMP. When removal of sludge from the lagoon is necessary, provisions must be taken to prevent damage to the lagoon dikes and liner.

14. Lagoons/storage ponds shall be kept free of foreign debris including, but not limited to, tires, bottles, light bulbs, gloves, syringes or any other solid waste.

15. The facility must have at least one of the following items at all times: (a) adequate animal waste application and handling equipment, (b) a lease, or other written agreement, for the use of the necessary equipment, or (c) a contract with a third party applicator capable of providing adequate waste application.

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16. The Permittee shall designate a certified animal waste management system operator with a valid certification to be in charge of the animal waste management system. The waste management system shall be operated by the Operator in Charge (OIC) or a person under the OIC's supervision.

17. In accordance with 15A NCAC 8F .0203(2)(2), the OIC or a designated back-up OIC of a Type A Animal Waste Management System shall inspect, or a person under the supervision of an OIC or designated back-up OIC shall inspect, the land application site as often as necessary to insure that the animal waste is land applied in accordance with the CAWMP. In no case shall the time between inspections be more than 120 minutes during the application of waste. A record of each inspection shall be recorded on forms supplied by, or approved by, the Division and shall include the date, time, sprayfield number and name of the operator for each inspection. Inspection shall include but not be limited to visual observation of application equipment, spray fields, subsurface drain outlets, ditches, and drainage ways for any discharge of waste.

    The Permittee may assert as an affirmative defense in any enforcement action alleging noncompliance with the requirements imposed in this condition that such noncompliance was due to circumstances beyond the Permittee's control. A notation shall be made on the form indicating the inspection affected by such circumstance and an explanation setting forth the circumstances claimed to have been beyond the Permittee's control shall be submitted with the form.

18. The Director may require any permittee to install and operate flow meters with flow totalizers based on the facility's violations and/or incomplete or incorrect record keeping events.

19. No waste shall be applied in wind conditions that might reasonably be expected to cause the mist to reach surface waters or wetlands or cross property lines or field boundaries.

20. The Permittee shall maintain buffer strips or other equivalent practices as specified in the facility's CAWMP near feedlots, manure storage areas and land application areas.

21. Waste shall not be applied on land that is flooded, saturated with water, frozen or snow covered at the time of land application.

22. Land application of waste is prohibited during precipitation events. The Permittee shall consider pending weather conditions in making the decision to land apply waste and shall document the weather conditions at the time of land application on forms supplied by or approved by the Division.

    Land application of waste shall cease within four (4) hours of the time that the National Weather Service issues a Hurricane Warning, Tropical Storm Warning, or a Flood Watch associated with a tropical system including a hurricane, tropical storm, or tropical depression for the county in which the permitted facility is located. Watches and warnings are posted on the National Weather Service's website located at: **www.weather.gov**. More detailed website information can be found on Page 2 of the Certificate of Coverage. Watch and warning information can also be obtained by calling the local National Weather Service Office that serves the respective county, which can be found on Page 2 of the Certificate of Coverage.

    The Director may require any permittee to install, operate and maintain devices on all irrigation pumps/equipment designed to automatically stop irrigation activities during precipitation. This decision will be based on the facility's compliance history for irrigation events.

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23. Land application activities shall cease on any application site that exceeds a Mehlich 3 Soil Test Index for Copper of greater than 3,000 (108 pounds per acre) or Zinc of greater than 3,000 (213 pounds per acre).

24. All waste application equipment must be tested and calibrated once in the first two years after issuance of the COC and then at least once every two years thereafter. The results must be documented on forms provided by, or approved by, the Division.

25. Any major structural repairs to lagoons/storage ponds must have written documentation from a technical specialist certifying proper design and installation. However, if a piece of equipment is being replaced with a piece of equipment of the identical specifications, no technical specialist approval is necessary [i.e. piping, reels, valves, pumps (if the gallons per minute (gpm) capacity is not being increased or decreased), etc.] unless the replacement involves disturbing the lagoon/storage pond embankment or liner.

26. Crops for which animal waste is land applied must be removed from the land application site and properly managed and utilized unless other management practices are approved in the CAWMP.

27. In accordance with NRCS North Carolina Conservation Practice Standard No. 359 "Waste Treatment Lagoon", an operator may temporarily lower lagoon levels to provide irrigation water during drought periods and to provide additional temporary storage for excessive rainfall during the hurricane season and in preparation for the following winter months. All conditions of NRCS NC Standard No. 359 must be satisfied prior to lowering lagoon levels below designed stop pump levels.

III. MONITORING AND REPORTING REQUIREMENTS

1. An inspection of the waste collection, treatment, and storage structures, and runoff control measures shall be conducted and documented at a frequency to insure proper operation but at least monthly and after all storm events of greater than one (1) inch in 24 hours. For example, lagoons/storage ponds, and other structures should be inspected for evidence of erosion, leakage, damage by animals or discharge. Inspection shall also include visual observation of subsurface drain outlets, ditches, and drainage ways for any discharge of waste.

2. Monitoring and Recording Freeboard Levels

   a. Highly visible waste-level gauges shall be maintained to mark the level of waste in each lagoon/storage pond that does not gravity feed through a free flowing transfer pipe into a subsequent structure. The gauge shall have readily visible permanent markings.

      The waste level in each lagoon with a waste level gauge shall be monitored and recorded weekly on forms supplied by or approved by the Division.

      The Director may require more frequent monitoring and recording of waste levels based on the facility's compliance history for freeboard violations.

   b. Any facility which experiences freeboard violations in any two consecutive years following the issuance of this General Permit, or as determined necessary by the Director, shall monitor and record waste levels as follows:

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In addition to the facility's existing lagoon waste-level gauges, automated lagoon/storage pond waste-level monitors and recorders (monitored and recorded at least hourly) must be installed on all treatment and storage structures covered by a COC issued under this General Permit to measure and record freeboard. This equipment must be properly maintained and calibrated in a manner consistent with manufacturer's operation and maintenance recommendations. This automated equipment must be in place no later than ninety (90) days following notification from the Director. 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.

If an automated level monitor(s) becomes inoperable, the Permittee shall:

i. report the problem by telephone to the appropriate Division Regional Office as soon as possible, but in no case more than 24 hours following first knowledge of the problem; and,

ii. make any needed repairs to the equipment as quickly as possible, and take and record daily waste levels at the same time every day until such time as the automated equipment is placed back into operation.

c. The Director may require new or modified waste-level gauges at any facility if it is determined that the existing gauges are not adequate to accurately indicate actual lagoon levels, or the various lagoon levels required to be maintained by this General Permit or the facility's CAWMP.

3. Monitoring and Recording Precipitation Events

a. Precipitation events at facilities issued a COC to operate under this General Permit shall be monitored and recorded as follows:

A rain gauge must be installed at a site that is representative of the weather conditions at the farm's land application site(s) to measure all precipitation events. The precipitation type and amount must be recorded daily for all precipitation events and maintained on site for review by the Department of Environment and Natural Resources (Department).Daily records do not need to be maintained for those days without precipitation events.

b. The Director may require that an automated rain gauge and recorder must be installed on site to measure and record all precipitation events. This equipment must be properly maintained and calibrated in a manner consistent with manufacturer's operation and maintenance recommendations. This automated equipment must be in place no later than ninety (90) days following receipt of notice from the Director.

If an automated rain gauge(s) becomes inoperable, the Permittee shall:

i. report the problem by telephone to the appropriate Division Regional Office as soon as possible, but in no case more than twenty four (24) hours following first knowledge of the problem; and,

ii. make any needed repairs to the equipment as quickly as possible, and take and record all rainfall events until such time as the automated equipment is placed back into operation.

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4. A representative Standard Soil Fertility Analysis, including pH, phosphorus, copper, and zinc, shall be conducted on each application field receiving animal waste in accordance with NCGS 143-215.10C(e)(6). As of the effective date of this General Permit, the Statute requires that the analysis be conducted at least annually.

5. An analysis of the animal waste shall be conducted in accordance with recommended laboratory sampling procedures as close to the time of application as practical and at least within sixty (60) days (before or after) of the date of application. Every reasonable effort shall be made to have the waste analyzed prior to the date of application and as close to the time of waste application as possible. This analysis shall include the following parameters:

Nitrogen	Zinc
Phosphorus	Copper

6. The Permittee shall record all irrigation and land application event(s) including hydraulic loading rates, nutrient loading rates and cropping information. The Permittee shall also record removal of solids and document nutrient loading rates if disposed of on-site, or record the off-site location(s). These records must be on forms supplied by, or approved by, the Division.

7. A record shall be created and maintained of all transfers of waste between waste structures on the same site not typically operated in series. Such record shall include at least the identity of the structure from which the waste was transferred, the identity of the structure receiving the waste, the date and time of transfer and the total volume of waste transferred.

8. The Permittee must maintain monthly stocking records for the facility and make the records available to the Department.

9. If, for any reason, there is a discharge from the waste collection, treatment, storage and application systems (including the land application sites), to surface waters or wetlands, the Permittee is required to make notification in accordance with Condition III. 13. The discharge notification shall include the following information:

   a. Description of the discharge: A description of the discharge including an estimate of the volume discharged, a description of the flow path to the receiving surface waters or wetlands and a site sketch showing the path of the waste.

   b. Time of the discharge: The length of time of the discharge, including the exact dates and times that it started and stopped, and if not stopped, the anticipated time the discharge is expected to continue.

   c. Cause of the discharge: A detailed statement of the cause of the discharge. If caused by a precipitation event, detailed information from the on-site rain gauge concerning the inches and duration of the precipitation event.

   d. All steps being taken to reduce, stop and cleanup the discharge. All steps to be taken to prevent future discharges from the same cause.

   e. Analysis of the waste: A copy of the last waste analysis conducted as required by Condition III. 5. above.

   f. A waste sample, obtained within seventy-two (72) hours following first knowledge of the discharge to surface waters or wetlands, from the source lagoon/storage pond, shall be analyzed for the following minimum parameters:

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Fecal coliform bacteria	Five-day biochemical oxygen demand (BOD_5)
Total suspended solids	Total phosphorous
Ammonia nitrogen (NH_3-N)	Total Kjeldahl nitrogen (TKN)
Nitrate nitrogen (NO_3-N)	

Monitoring results must be submitted to the Division within thirty (30) days of the discharge event.

10. In accordance with 15A NCAC 02T .0108(c), the Division may require any monitoring and reporting (including but not limited to groundwater, surface water or wetland, waste, sludge, soil, lagoon/storage pond levels and plant tissue) necessary to determine the source, quantity, quality, and effect of animal waste upon the surface waters, groundwaters or wetlands. Such monitoring, including its scope, frequency, duration and any sampling, testing, and reporting systems, shall meet all applicable Division requirements.

11. A copy of this General Permit, the facility's COC, certification forms, lessee and landowner agreements, the CAWMP and copies of all records required by this General Permit and the facility's CAWMP shall be maintained by the Permittee in chronological and legible form for a minimum of three (3) years. Records include but are not limited to: soil and waste analyses, rain gauge readings, freeboard levels, irrigation and land application event(s), past inspection reports and operational reviews, animal stocking records, records of additional nutrient sources applied (including but not limited to sludges, unused feedstuff leachate, milk waste, septage and commercial fertilizer), cropping information, waste application equipment testing and calibration, and records of removal of solids to off-site location(s). These records shall be maintained on forms provided or approved by the Division and shall be readily available at the facility (stored at places such as the farm residence, office, outbuildings, etc.) where animal waste management activities are being conducted for the life of this General Permit, unless otherwise specified in this General Permit.

12. Within fifteen (15) working days of receiving the request from the Division, the Permittee shall provide to the Division one (1) copy of all requested information and reports related to the operation of the animal waste management system. Once received by the Division, all such information and reports become public information, unless they constitute confidential information under NC G.S. 132-1.2, and shall be made available to the public by the Division as specified in Chapter 132 of the General Statutes.

13. Regional Notification:

    The Permittee shall report by telephone to the appropriate Division Regional Office as soon as possible, but in no case more than twenty-four (24) hours following first knowledge of the occurrence of any of the following events:

    a. Any discharge to ditches, surface waters or wetlands.

    b. Any discharge that poses a serious threat to the environment or human safety or health.

    c. Failure to maintain storage capacity in a lagoon/storage pond greater than or equal to that required in Condition V. 2. of this General Permit.

    d. Over applying waste either in excess of the limits set out in the CAWMP or where runoff enters surface waters or wetlands.

    e. Failure of any component of the animal waste collection, treatment, storage and land application system resulting in a discharge to surface waters or wetlands.

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f. Any failure of the waste treatment and disposal system that renders the facility incapable of adequately receiving, treating or storing the waste and/or sludge.

g. A spill or discharge from a vehicle transporting waste or sludge to the land application field which results in a discharge to surface waters or wetlands.

h. A spill or discharge from a vehicle transporting waste or sludge to the land application field which results in a discharge that poses a serious threat to surface waters, wetlands, or human health or safety.

i. Any deterioration or leak in a lagoon/storage pond that poses an immediate threat to the environment or human safety or health.

For any emergency, which requires immediate reporting after normal business hours, contact must be made with the Division of Emergency Management at **1-800-858-0368**.

The Permittee shall also file a written report to the appropriate Division Regional Office within five (5) calendar days following first knowledge of the occurrence. This report shall outline the actions taken or proposed to be taken to correct the problem and to ensure that the problem does not recur. The requirement to file a written report may not be waived by the Division Regional Office.

14. The Director may require any permittee to file an annual certification report based on the compliance history of the facility. If required, the report must be filed on forms provided by the Division.

15. The Director may require facilities to submit additional reports and/or certifications based on the facility's compliance history.

16. In the event of a discharge of 1,000 gallons or more of waste to surface waters or wetlands, the Permittee must issue a press release to all print and electronic news media that provide general coverage in the county in which the discharge occurred setting out the details of the discharge. The press release must be issued within forty-eight (48) hours after it is determined that the discharge has reached the surface waters or wetlands. A copy of the press release and a list of the news media to which it was distributed must be kept for at least one (1) year after the discharge and must be distributed to any person upon request.

17. In the event of a discharge of 15,000 gallons or more of animal waste to surface waters or wetlands, a public notice is required in addition to the press release described in Condition III 16. The public notice must be placed in a newspaper having general circulation in the county in which the discharge occurred and the county immediately downstream within ten (10) days of the discharge. The minimum content of the notice is the name of the facility, location of the discharge, estimated volume of waste entering state waters, time and date discharge occurred, duration of the discharge, identification water body that was discharged into including creek and river basin if applicable, actions taken to prevent further discharge, and a facility contact person and phone number.

18. If a discharge of 1,000,000 gallons of wastewater or more reaches surface waters or wetlands, the appropriate Division Regional Office must be contacted to determine in what additional counties, if any, a public notice must be published. A copy of all public notices and proof of publication must be sent to the Division within thirty (30) days of the discharge.

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19. All facilities, which are issued a COC to operate under this General Permit, shall conduct a survey of the sludge accumulation in all lagoons every year. The survey report should be written on forms provided or approved by the Division and shall include a sketch showing the depth of sludge in the various locations within each lagoon. This survey frequency may be reduced if it can be demonstrated to the satisfaction of the Division that the rate of sludge accumulation does not warrant an annual survey.

    If the sludge accumulation is such that the structure does not satisfy the criteria set by NRCS NC Conservation Practice Standard No. 359, a sludge removal or management plan must be submitted to the appropriate Division Regional Office within ninety (90) days of the determination. The plan shall describe removal and waste utilization procedures to be used. Compliance regarding sludge levels must be achieved within two (2) years of the determination.

20. If required by 15A NCAC 02T Section .1300, the Division may notify the permittee to conduct compliance water quality monitoring on surface and/or groundwater during the period of this General Permit. This monitoring will not be required until such time as the Division notifies the permittee. A monitoring plan shall be established within the time specified by the above referenced rules. All monitoring must be performed using standard sampling protocol, tested at a laboratory approved by the Division, and results must be submitted to the Division.

IV. INSPECTIONS AND ENTRY

1. The Permittee shall allow any authorized representative of the Department, upon the presentation of credentials and other documents as may be required by law and in accordance with reasonable and appropriate biosecurity measures, to:

    a. Enter the Permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this General Permit;

    b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this General Permit;

    c. Inspect, at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this General Permit; and,

    d. Sample or monitor, at reasonable times, for the purpose of assuring permit compliance, any substances or parameters at any location.

V. GENERAL CONDITIONS

1. The issuance of a COC to operate under this General Permit shall not relieve the Permittee of the responsibility for compliance with all applicable surface water, wetlands, groundwater and air quality standards or for damages to surface waters, wetlands or groundwaters resulting from the animal operation.

2. The maximum waste level in lagoons/storage ponds shall not exceed that specified in the facility's CAWMP. At a minimum, maximum waste level for lagoons/storage ponds must not exceed the level that provides adequate storage to contain the 25-year, 24-hour storm event plus an additional one (1) foot of structural freeboard except that there shall be no violation of this condition if: (a) there is a storm event more severe than a 25-year, 24-hour event, (b) the Permittee is in compliance with its CAWMP, and (c) there is at least one (1) foot of structural freeboard.

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In addition to the above requirements, for new and expanding farms with lagoon and storage pond designs completed after September 1, 1996, storage must also be provided for the heavy rainfall factor for the lagoons/storage pond. In case of lagoons/storage ponds in series that are gravity fed, the 25-year, 24-hour storm event and/or the heavy rainfall factor storage requirement for the system may be designed into the lowest lagoon/storage pond in the system. However, adequate freeboard must be designed into the upper lagoons/storage ponds to allow sufficient storage to prevent the waste level from rising into the structural freeboard while the storm water is draining into the lowest structure in the system.

3. Any containment basin, such as a lagoon or a storage pond, used for waste management shall continue to be subject to the conditions and requirements of this General Permit until properly closed. When the containment basin is properly closed in accordance with the NRCS NC Conservation Practice Standard No. 360 "Closure of Waste Impoundments," February 2008 or any subsequent amendment, the containment basin shall not be subject to the requirements of this General Permit. The Permittee must submit a letter to the Division to request rescission of the COC by providing documentation of closure of all containment basins.

   Closure shall also include a minimum of 24 hours pre-notification of the Division and submittal of the Animal Waste Storage Pond and Lagoon Closure Report Form to the address identified on the form within fifteen (15) days of completion of closure.

4. This General Permit allows for the distribution of up to four cubic yards of manure per visit to individuals for personal use. The Permittee must provide the recipient(s) with information on the nutrient content of the manure. Distribution of greater quantities must be to individuals or businesses permitted to distribute the waste, or to be land applied to sites identified in the Permittee's CAWMP.

   The Permittee must inform the recipient(s) of his/her responsibilities to properly manage the land application of manure. Record keeping for the distribution of manure up to four (4) cubic yards per visit to individuals for personal use is not required.

5. The annual permit fee shall be paid by the Permittee within thirty (30) days after being billed by the Division. Failure to pay the fee accordingly constitutes grounds for revocation of its COC to operate under this General Permit.

6. Failure of the Permittee to maintain, in full force and effect, lessee and landowner agreements, which are required in the CAWMP, shall constitute grounds for revocation of its COC to operate under this General Permit.

7. A COC to operate under this General Permit is not transferable. In the event there is a desire for the facility to change ownership, or there is a name change of the Permittee, a Notification of Change of Ownership form must be submitted to the Division, including documentation from the parties involved and other supporting materials as may be appropriate. This request shall be submitted within sixty (60) days of change of ownership. The request will be considered on its merits and may or may not be approved.

8. A COC to operate under this General Permit is effective only with respect to the nature and volume of wastes described in the application and other supporting data. The Permittee shall notify the Division immediately of any applicable information not provided in the permit application.

   Any proposed modification to an animal waste management system including the installation of lagoon covers shall require approval from the Division prior to construction.

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9. If the Permittee wishes to continue an activity regulated by this General Permit after the expiration date of this General Permit, the Permittee must apply for and obtain a new COC. Renewal applications must be filed at least 180 days prior to the expiration of the General Permit.

10. The issuance of a COC to operate under this General Permit does not prohibit the Division from reopening and modifying the General Permit or COC, revoking and reissuing the General Permit or COC, or terminating the General Permit or COC as allowed by the appropriate laws, rules, and regulations.

11. The Director may require any person, otherwise eligible for coverage under this General Permit, to apply for an individual permit by notifying that person that an application is required.

12. The Groundwater Compliance Boundary is established by 15A NCAC 2L .0102 and 15A NCAC 2T .0103. An exceedance of Groundwater Quality Standards at or beyond the Compliance Boundary is subject to the requirements of 15A NCAC 2L and the Division in addition to the penalty provisions applicable under the North Carolina General Statutes.

13. Upon abandonment or depopulation for a period of four years or more, the Permittee must submit documentation to the Division demonstrating that all current NRCS standards are met prior to restocking of the facility.

VI. PENALTIES

1. Failure to abide by the conditions and limitations contained in this General Permit; the facility's COC; the facility's CAWMP; and/or applicable state law; may subject the Permittee to an enforcement action by the Division including but not limited to the modification of the animal waste management system, civil penalties, criminal penalties and injunctive relief.

2. The Permittee must comply with all conditions of this General Permit. Any permit noncompliance constitutes a violation of state law and is grounds for enforcement action; for permit coverage termination, revocation and reissuance, or modification; or denial of a permit coverage renewal application.

3. It shall not be a defense for a Permittee in an enforcement action to claim that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this General Permit.

VII. DEFINITIONS

25-year, 24-hour rainfall or storm event means the maximum 24-hour precipitation event with a probable recurrence interval of once in 25 years, as defined by the National Weather Service in Technical Paper Number 40, "Rainfall Frequency Atlas of the United States," May 1961, and subsequent amendments, or equivalent regional or state rainfall probability information developed therefrom.

Agronomic rates means the amount of animal waste and/or other nutrient sources to be applied to lands as outlined in NRCS NC Conservation Practice Standards No. 590 "Nutrient Management" and No. 633 "Waste Utilization" or as recommended by the NCDA&CS and the North Carolina Cooperative Extension Service at the time of certification of the Animal Waste Management Plan by the appropriate certified technical specialist.

Amendment to the CAWMP means a change and/or addition to a part(s) of the plan, and requires that the change and/or addition adhere to current applicable standards. The following are examples of amendments to the CAWMP:

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- In an existing CAWMP, a change in crops and/or cropping pattern that utilizes 25% or less of the N generated is considered a plan amendment. Additional acreage needed to facilitate the change in crops and/or cropping pattern is permissible and considered part of the amendment.

- The addition of winter crops and/or interseeded perennial crops are considered amendments to an existing CAWMP when the operation does not require additional acreage and/or crops for N utilization, and does not exceed the 25% criteria stated above.

- When a CAWMP cannot meet N utilization requirements due to land lost to irrigation inefficiency (useable versus total acres), then the CAWMP may be amended to increase available acreage and/or change the crop for N utilization. This is the only exception to the 25% N criteria for plan revision.

- Inclusions of emergency action plans, and insect, odor and mortality checklists are considered CAWMP amendments.

- Including additional acreage for land application beyond what is required in the existing CAWMP is considered a plan amendment.

Animal feeding operation means a lot or facility (other than an aquatic animal production facility) where the following conditions are met: (i) animals (other than aquatic animals) have been, are, or will be stabled or confined and fed or maintained for a total of forty five (45) days or more in any twelve (12) month period, and (ii) crops, vegetation, forage growth, or post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility. Two or more animal feeding operations under common ownership are considered to be a single animal feeding operation if they adjoin each other, or if they use a common area or system for the disposal of wastes.

Certification means technical specialist certification of the CAWMP in accordance with the requirements of 15A NCAC 02T .1304. It is unrelated to terms "Annual Certification" as used in Condition III.14 of this Permit, and the "No Discharge Certification Option" allowed by the November 2008 EPA CAFO Rule.

Ditch means any man made channel for the purpose of moving water off a site to the surface waters.

Excessive Ponding means any area of the application field where visible liquid waste is ponded on the surface of the land application site more than four (4) hours following the application of waste. Excessive ponding also means any areas where the ponding of waste has resulted in crop failure.

Groundwaters means any subsurface waters, as defined in 15A NCAC 2L .0102.

Land application means the application of wastewater and/or waste solids onto or incorporation into the soil.

Major changes to the CAWMP means changes in the number of animals, type of operation (feeder to finish to wean to feeder), retrofit of a lagoon, installation of a new irrigation system, and similar type changes. Recertification is only required for major changes to the CAWMP. Major changes to a facility must first be approved by DWQ. The new CAWMP and the certification shall be submitted with a request that the COC be amended to reflect the changes. The facility may not make the changes until a new or amended COC has been issued.

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Revision to the CAWMP means a change to an entire CAWMP to meet current applicable standards. A CAWMP must be revised if the operation cannot utilize all N nitrogen generated by the animal production in accordance with the existing CAWMP, except for the specific conditions noted in the CAWMP amendment criteria as previously defined. For an existing CAWMP, a change in crops and/or cropping pattern that utilizes more than 25% of the N generated by the operation is considered a plan revision. Any change to an existing CAWMP, whether an amendment or revision, must be signed and dated by both the producer and a technical specialist for the new CAWMP to be valid. A revision of the CAWMP does not require recertification.

State Waters means all surface waters, wetlands, groundwaters and waters of the United States located in the State.

Surface Waters means any stream, river, brook, swamp, lake, sound, tidal estuary, bay, creek, reservoir, waterway, or other surface body or surface accumulation of water, whether public or private, or natural or artificial, that is contained in, flows through, or borders upon any portion of the State of North Carolina, including any portion of the Atlantic Ocean over which the State has jurisdiction as well as any additional Waters of the United States which are located in the State.

Waste means manure, animal waste, process wastewater and/or sludge generated at an animal feeding operation.

Wetlands means areas that are inundated or saturated by an accumulation of surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions, as defined in 15A NCAC 2B .0202.

This General Permit issued the 20th day of February, 2009.

NORTH CAROLINA ENVIRONMENTAL MANAGEMENT COMMISSION

_____, Director
Coleen H. Sullins
North Carolina Division of Water Quality
By Authority of the Environmental Management Commission

Permit Number AWG100000

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The General Permits cover existing swine facilities and existing operations that were previously permitted by the Division and are not portable; therefore, the renewal of these General Permits does not cause additional impacts to communities. Since 1995, all new swine operations have been subject to the Swine Farm Siting Act (G.S. §106-800) which establishes limitations on the siting of swine houses for permitted swine operations. In 2007, G.S. §143-215.10I made permanent the moratorium on the construction of new swine operations or the expansion of existing swine operations that employ a lagoon-sprayfield system as the primary method of waste treatment and disposal. Any new or expanding facilities permitted after that time must satisfy the Performance Standards for New/Expanding Swine Operation (G.S. §143-215.10I and 15A NCAC 02T .1307-1309 and 15A NCAC 02D .1808).

Earthen structures for new/expanding swine operations must be designed and constructed with synthetic liners to eliminate seepage, 15A NCAC 02T .1307(1)(A).

Since 1995, all new swine operations have been subject to the Swine Farm Siting Act (G.S. §106-800) which establishes limitations on the siting of swine houses for permitted swine operations including setbacks to occupied residences, schools, hospitals, churches, outdoor recreational facilities, national parks, State Parks, historic properties acquired by the state, child care centers, property boundaries, and wells.

State of North Carolina
Department of Environmental Quality
Division of Water Resources

Animal Feeding Operations Permit Application Form

(THIS FORM MAY BE PHOTOCOPIED FOR USE AS AN ORIGINAL)

Innovative Animal Waste Management System Permit

1. GENERAL INFORMATION:

1.1 Facility name: _____

1.2 Print Land Owner's name: _____

1.3 Mailing address: _____

City, State: _____ Zip: _____

Telephone number (include area code): (_____) _____ - _____

1.4 Physical address: _____

City, State: _____ Zip: _____

Telephone number (include area code): (_____) _____ - _____

1.5 County where facility is located: _____

1.6 Facility location (directions from nearest major highway, using SR numbers for state roads): _____

1.7 Farm Manager's name (if different from Land Owner): _____

1.8 Lessee's / Integrator's name (if applicable; circle which type is listed): _____

1.9 Facility's original start-up date: _____ Date(s) of facility expansion(s) (if applicable): _____

2. OPERATION INFORMATION:

2.1 Facility number: _____

2.2 Operation Description:

Please enter the Design Capacity of the system. The "No. of Animals" should be the maximum number for which the waste management structures were designed.

Type of Swine	No. of Animals	Type of Poultry	No. of Animals	Type of Cattle	No. of Animals
☐ Wean to Feeder	_____	☐ Layer	_____	☐ Beef Brood Cow	_____
☐ Feeder to Finish	_____	☐ Non-Layer	_____	☐ Beef Feeder	_____
☐ Farrow to Wean (# sow)	_____	☐ Turkey	_____	☐ Beef Stocker Calf	_____
☐ Farrow to Feeder (# sow)	_____	☐ Turkey Poults	_____	☐ Dairy Calf	_____
☐ Farrow to Finish (# sow)	_____			☐ Dairy Heifer	_____
☐ Wean to Finish (# sow)	_____			☐ Dry Cow	_____
☐ Gilts	_____			☐ Milk Cow	_____
☐ Boar/Stud	_____				

☐ Other Type of Livestock on the farm: _____ No. of Animals: _____

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2.3 Acreage cleared and available for application (excluding all required buffers and areas not covered by the application system): _____ Required Acreage (as listed in the CAWMP): _____

2.4 Number of lagoons: _____ Total Capacity (cubic feet): _____ Required Capacity (cubic feet): _____

Number of Storage Ponds: _____ Total Capacity (cubic feet): _____ Required Capacity (cubic feet): _____

2.5 Are subsurface drains present within 100' of any of the application fields? **YES** or **NO** (circle one)

2.6 Are subsurface drains present in the vicinity or under the waste management system? **YES** or **NO** (circle one)

2.7 Does this facility meet all applicable siting requirements? **YES** or **NO** (circle one)

3. REQUIRED ITEMS CHECKLIST:

Please indicate that you have included the following required items by signing your initials in the space provided next to each item.

	Applicants Initials
3.1 One completed and signed original and two copies of the application for Innovative Animal Waste Management System Application Form	_____
3.2 Three copies of a general location map indicating the location of the animal waste facilities and field locations where animal waste is land applied and a county road map with the location of the facility indicated;	_____
3.3 Three copies of the entire Certified Animal Waste Management Plan (CAWMP). If the facility does not have a CAWMP, it must be completed prior to submittal of a permit application for animal waste operations.	_____
3.4 Three copies of a detailed narrative of the Innovative Animal Waste Management System	_____
3.5 Three copies of all engineering documents, including, but not limited to, calculations, equipment specifications, plan and profile drawings to scale, construction materials, supporting equations or justifications	_____

The CAWMP **must** include the following components. *Some of these components may not have been required at the time the facility was certified but should be added to the CAWMP for permitting purposes*:

3.3.1 The Waste Utilization Plan (WUP) must include the amount of Plant Available Nitrogen (PAN) produced and utilized by the facility
3.3.2 The method by which waste is applied to the disposal fields (e.g. irrigation, injection, etc.)
3.3.3 A map of every field used for land application
3.3.4 The soil series present on every land application field
3.3.5 The crops grown on every land application field
3.3.6 The Realistic Yield Expectation (RYE) for every crop shown in the WUP
3.3.7 The PAN applied to every land application field
3.3.8 The waste application windows for every crop utilized in the WUP
3.3.9 The required NRCS Standard specifications
3.3.10 A site schematic
3.3.11 Emergency Action Plan
3.3.12 Insect Control Checklist with chosen best management practices noted
3.3.13 Odor Control Checklist with chosen best management practices noted
3.3.14 Mortality Control Checklist with the selected method noted
3.3.15 Lagoon/storage pond capacity documentation (design, calculations, etc.); please be sure to include any site evaluations, wetland determinations, or hazard classifications that may be applicable to your facility
3.3.16 Operation and Maintenance Plan

If your CAWMP includes any components not shown on this list, please include the additional components with your submittal. (Composting, waste transfers, etc.)

4. APPLICANT'S CERTIFICATION:

I, _____ (Land Owner's name listed in question 1.2), attest that

this application for _____(Facility name listed in question 1.1) has been reviewed by me and is accurate and complete to the best of my knowledge. I understand that if all required parts of this application are not completed and that if all required supporting information and attachments are not included, this application package will be returned to me as incomplete.

Signature _____ Date _____

5. MANAGER'S CERTIFICATION: (complete only if different from the Land Owner)

I, _____ (Manager's name listed in question 1.7), attest that this

application for _____ _____(Facility name listed in question 1.1) has been reviewed by me and is accurate and complete to the best of my knowledge. I understand that if all required parts of this application are not completed and that if all required supporting information and attachments are not included, this application package will be returned as incomplete.

Signature _____ Date _____

THE COMPLETED APPLICATION PACKAGE, INCLUDING ALL SUPPORTING INFORMATION AND MATERIALS, SHOULD BE SENT TO THE FOLLOWING ADDRESS:

NORTH CAROLINA DIVISION OF WATER RESOURCES
WATER QUALITY REGIONAL OPERATIONS SECTION
ANIMAL FEEDING OPERATIONS PROGRAM
1636 MAIL SERVICE CENTER
RALEIGH, NORTH CAROLINA 27699-1636
TELEPHONE NUMBER: (919) 733-3221
FAX NUMBER: (919) 715-6048

6. SURFACE WATER CLASSIFICATION:

This form must be completed by the appropriate DWR regional office and included as a part of the project submittal information.

INSTRUCTIONS TO NC PROFESSIONALS:

The classification of the downslope surface waters (the surface waters that any overflow from the facility would flow toward) in which this animal waste management system will be operated must be determined by the appropriate DWR regional office. Therefore, you are required, **prior to submittal of the application package,** to submit this form, with items 1 through 6 completed, to the appropriate Division of Water Resources, Water Quality Regional Operations Supervisor (see page 6 of 10). At a minimum, you must include an 8.5" by 11" copy of the portion of a 7.5 minute USGS Topographic Map which shows the location of this animal waste application system and the downslope surface waters in which they will be located. Identify the closest downslope surface waters on the attached map copy. **Once the regional office has completed the classification, reincorporate this completed page and the topographic map into the complete application form and submit the application package.**

6.1 Farm Name: _____

6.2 Name & complete address of engineering firm: _____

Telephone number: (_____) _____ - _____

6.3 Name of closest downslope surface waters: _____

6.4 County(ies) where the animal waste management system and surface waters are located_____

6.5 Map name and date: _____

6.6 NC Professional's Seal (If appropriate), Signature, and Date:

TO: REGIONAL AQUIFER PROTECTION SUPERVISOR

Please provide me with the classification of the watershed where this animal waste management facility will be or has been constructed or field located, as identified on the attached map segment(s):

Name of surface waters:_____

Classification (as established by the Environmental Management Commission):_____

Proposed classification, if applicable: _____

Signature of regional office personnel: _____ Date:_____

(All attachments must be signed)

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DIVISION OF WATER RESOURCES REGIONAL OFFICES (10/06)

Asheville Regional WQROS Supervisor
2090 U.S. Highway 70
Swannanoa, NC 28778
(828) 296-4500
Fax (828) 299-7043

Avery	Macon
Buncombe	Madison
Burke	McDowell
Caldwell	Mitchell
Cherokee	Polk
Clay	Rutherford
Graham	Swain
Haywood	Transylvania
Henderson	Yancey
Jackson	

Washington Regional WQROS Supervisor
943 Washington Square Mall
Washington, NC 27889
(252) 946-6481
Fax (252) 975-3716

Beaufort	Jones
Bertie	Lenoir
Camden	Martin
Chowan	Pamlico
Craven	Pasquotank
Currituck	Perquimans
Dare	Pitt
Gates	Tyrell
Greene	Washington
Hertford	Wayne
Hyde	

Raleigh Regional WQROS Supervisor
1628 Mail Service Center
Raleigh, NC 27699-1628
(919) 791-4200
Fax (919) 571-4718

Chatham	Nash
Durham	Northampton
Edgecombe	Orange
Franklin	Person
Granville	Vance
Halifax	Wake
Johnston	Warren
Lee	Wilson

Fayetteville Regional WQROS Supervisor
225 Green Street, Suite 714
Fayetteville, NC 28301-5094
(910) 433-3300
Fax (910) 486-0707

Anson	Moore
Bladen	Richmond
Cumberland	Robeson
Harnett	Sampson
Hoke	Scotland
Montgomery	

Mooresville Regional WQROS Supervisor
610 East Center Avenue
Mooresville, NC 28115
(704) 663-1699
Fax (704) 663-6040

Alexander	Lincoln
Cabarrus	Mecklenburg
Catawba	Rowan
Cleveland	Stanly
Gaston	Union
Iredell	

Wilmington Region WQROS Supervisor
127 Cardinal Drive Extension
Wilmington, NC 28405-3845
(910) 796-7215
Fax (910) 350-2004

Brunswick	New Hanover
Carteret	Onslow
Columbus	Pender
Duplin	

Winston-Salem Regional WQROS Supervisor
450 Hanes Mill Road, Suite 300
Winston-Salem, NC 27105
Phone (336) 776-9800
Fax (336) 776-9797

Alamance	Rockingham
Alleghany	Randolph
Ashe	Stokes
Caswell	Surry
Davidson	Watauga
Davie	Wilkes
Forsyth	Yadkin
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Thursday, December 18, 2014

The Charlotte Observer

Notice Type: Public Notice
Posting Date : 10/28/2013 Expiration Date : 11/11/2013

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NOTICE OF PUBLIC MEETING TO BE HELD BY THE NORTH CAROLINA ENVIRONMENTAL MANAGEMENT COMMISSION ON INTENT TO ISSUE STATE GENERAL PERMITS FOR ANIMAL OPERATIONS SUBJECT: Public meetings have been scheduled concerning the issuance of animal waste State General Permits for the following types of animal operations: AWG100000 - Swine Operations AWG200000 - Cattle & Dairy Operations AWG300000 - Poultry Operations PURPOSE: The North Carolina Environmental Management Commission proposes to issue General Permits for animal waste operations subject to specific limitations and special conditions. The Division of Water Resources pursuant to NCGS 143-215.4(b)(1) and (2) and15A NCAC 02T .0111 has determined that it is in the public interest to hold meetings to receive pertinent public comments. Information received by December 6, 2013 will be taken into consideration in finalizing the permitting decisions. MEETINGS: The meetings will be conducted in the following manner: Following an explanation of the proposed permit conditions, public comments, statements, data and other information may be submitted in writing or presented orally at the meeting. Comment should specifically address issues directly related to the proposed permits. Persons desiring to speak should sign up during registration. Presentations longer than three minutes must be accompanied by three (3) written copies to be filed with the meeting clerk during registration. Cross examination of speakers will not be allowed; however, the meeting officers may ask questions for clarification. The meeting record will close at 5:00 pm on December 6, 2013. WHEN: November 12 and 14, 2013 at 7:00 pm. Registration begins at 6:30 pm. WHERE: November 12, 2013 Iredell County Center 444 Bristol Drive, Statesville, NC November 14, 2013 James Sprunt Community College - Monk Auditorium 133 James Sprunt Drive, Kenansville, NC INFORMATION: Copies of the draft permits and fact sheets are available at http://portal.ncdenr.org/web/wq/aps/afo or by contacting: Christine B. Lawson NC Division of Water Resources 1636 Mail Service Center Raleigh, NC 27699-1636 Phone: 919.807.6354 Written comments will be accepted at the above address. LP735873

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Agriculture

North Carolina Puts Limits on Hog Farm Lawsuits

By Andrew M. Ballard

Snapshot

- Nuisance awards now limited to value of plaintiffs' property
- Several such lawsuits pending against hog farms not affected
- Lawmakers enact measure over governor's veto

North Carolina has put a limit on the money that plaintiffs can recover from lawsuits filed against hog farms and other agricultural operations in the state over odors, flies and other nuisances.

Under H.B. 467, which the state Legislature approved over the veto of Gov. Roy Cooper (D), the awards in nuisance actions are limited to the value of the plaintiff's property. Several of such lawsuits against hog farms are currently pending in state courts, but wouldn't be impacted by the new law.

Agriculture and food processing have a significant presence in North Carolina, which is home to about 9.2 million hogs, most of which are located in some 2,000 industrial swine facilities operating in the eastern part of the state. In 1997, North Carolina prohibited the construction of new hog waste lagoons and spray fields.

Disparate Impact

Odors, disease vectors and negative health effects from hog farm operations in the state recently have been found by the Environmental Protection Agency to disproportionately affect African Americans, Latinos and Native Americans.

In his May 5 veto message, Cooper told lawmakers that nuisance actions are an important tool that can help protect the environment. "We used nuisance laws to force the Tennessee Valley Authority to stop air pollution from flowing into North Carolina and we won damages to improve air quality," he said.

"Special protection for one industry opens the door to weakening our nuisance laws in other areas which can allow real harm to homeowners, the environment and everyday North Carolinians," the governor wrote.

Industry Protection

The bill is backed by the North Carolina Pork Council, which said it "strikes a balance in providing clarity and certainty to farmers while ensuring that property owners remain protected." The group says pork producers are subject to stringent environmental regulations and unrestrained jury verdicts threaten the industry.

"Farmers across our state are grateful that the Senate has acted to override the Gov. Cooper veto to provide them more certainty and protection from predatory lawyers," Andy Curliss, CEO of the pork council, said in an email sent to Bloomberg BNA May 11.

"The votes this week in the House and Senate, by members of both political parties, sent a clear message that lawmakers support agriculture and its unique role in providing food to families," Curliss said.

Among the opponents of the measure is the North Carolina Conservation Network, which had praised Cooper's veto as "standing with vulnerable communities in our state and standing up for property rights." Industrial hog operations disproportionately impact communities of color with a "variety of nuisances," the group said.

And the veto override caught the attention of national environmental groups as well.

In comments provided to Bloomberg BNA May 11, Ken Cook, president of the Washington, D.C.-based Environmental

Working Group, said that a recent study his group conducted of about 60,000 residential properties in North Carolina within half a mile of a hog or poultry factory farm found abundant hog feces on homes and lawns, and in the air of private farms.

“Despite this disgusting evidence, state lawmakers are moving to strip citizens of their right to fair compensation through so-called nuisance suits against concentrated animal feeding operations, or CAFOs,” he said in the statement.

The House voted to override May 10 by a margin of 74-40, and the Senate agreed to do so May 11 by a vote of 30-18. A three-fifths majority in both chambers is needed to override a gubernatorial veto in North Carolina.

Lawmakers largely voted to override Cooper's veto along party lines, with Republicans voting for and Democrats against.

Forestry operations also are protected by the new limits on nuisance lawsuits under the law, which took effect upon the May 11 veto override and applies to causes of action commenced or brought on or after that date.

To contact the reporter on this story: Andrew M. Ballard in Raleigh, N.C. at aballard@bna.com

To contact the editor responsible for this story: Paul Connolly at PConnolly@bna.com

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For More Information

The measure H.B. 467 is available at http://
The governor's May 5 veto message is availa

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http://deq.nc.gov/about/divisions/water-resources/planning/classification-standards/classifications#Whataresurfacewaterclassification

The following waters are HQW by definition:

- **WS-I, Water Supply I** -Waters protected for all Class C uses plus waters used as sources of water supply for drinking, culinary, or food processing purposes for those users desiring maximum protection for their water supplies. WS-I waters are those within natural and undeveloped watersheds in public ownership. All WS-I waters are HQW by supplemental classification.
- **WS-II, Water Supply II** - Waters used as sources of water supply for drinking, culinary, or food processing purposes where a WS-I classification is not feasible. These waters are also protected for Class C uses. WS-II waters are generally in predominantly undeveloped watersheds. All WS-II waters are HQW by supplemental classification.
- **SA** (commercial shellfishing),
- **ORW**, **Outstanding Resource Waters** - All outstanding resource waters are a subset of High Quality Waters. This supplemental classification is intended to protect unique and special waters having excellent water quality and being of exceptional state or national ecological or recreational significance. To qualify, waters must be rated Excellent by DWR and have one of the following outstanding resource values:
    - Outstanding fish habitat and fisheries,
    - Unusually high level of waterbased recreation or potential for such kind of recreation,
    - Some special designation such as North Carolina Natural and Scenic River or National Wildlife Refuge,
    - Important component of state or national park or forest, or
    - Special ecological or scientific significance (rare or endangered species habitat, research or educational areas).
- **Primary nursery areas (PNA)** or other functional nursery areas designated by the Marine Fisheries Commission, or
- **Waters for which DWR has received a petition for reclassification to either WS-I or WS-II.**

Water Supply III (WS-III)

Waters used as sources of water supply for drinking, culinary, or food processing purposes where a more protective WS-I or II classification is not feasible. These waters are also protected for Class C uses. WS-III waters are generally in low to moderately developed watersheds.

Water Supply IV (WS-IV)

Waters used as sources of water supply for drinking, culinary, or food processing purposes where a WS-I, II or III classification is not feasible. These waters are also protected for Class C uses. WS-IV waters are generally in moderately to highly developed watersheds or Protected Areas.

Water Supply V (WS-V)

Waters protected as water supplies which are generally upstream and draining to Class WS-IV waters or waters used by industry to supply their employees with drinking water or as waters formerly used as water supply. These waters are also protected for Class C uses.

1997 General Assembly established moratoria on the construction or expansion of certain swine farms and on lagoons and animal waste management systems for certain swine farms.

1998 General Assembly extended these moratoria and established exceptions for animal waste management systems that meet certain performance standards.

1999 General Assembly further extended the moratoria so that moratoria have remained in effect continuously since 1 March 1997

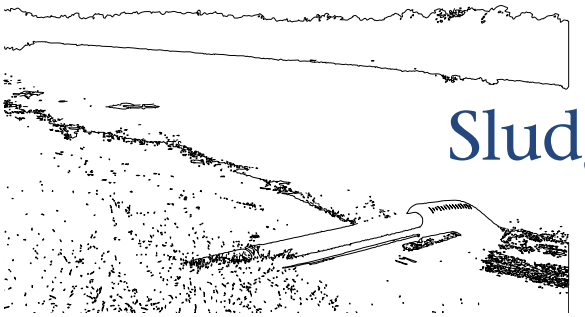
25 July 2000, the Attorney General of North Carolina entered into an agreement with Smithfield Foods, Incorporated, and certain other companies.

GENERAL ASSEMBLY OF NORTH CAROLINA
SESSION 2001
SESSION LAW 2001-254
HOUSE BILL 1312
Environmental Management Commission shall not issue a permit for an Page 2 Session Law 2001-254 House Bill 1312 animal waste management system for a new swine farm or the expansion of an existing swine farm for a period beginning on 1 March 1997 and ending on ~~1 July 2001~~.1 September 2003.

As of January L,1998, only a certified operator may apply animal waste to the land.

15A NCAC 02H .0226 INNOVATIVE ANIMAL WASTE OPERATION PERMITS FOR SWINE OPERATIONS
History Note: Authority G.S. 143-215.1; 143-215.10C; Clean Water Responsibility And Environmentally Sound Policy Act, S.L. 1997 c. 458;
Temporary Adoption Eff. August 21, 1998;
Temporary Adoption Expired May 11, 1999.

S.L. 1997-458; HOUSE BILL 515; **MORATORIA ON CONSTRUCTION OR EXPANSION OF SWINE FARMS**



Sludge Survey Methods for Anaerobic Lagoons

The sludge that accumulates in anaerobic lagoons consists of organic and nonorganic material produced when anaerobic organisms digest animal waste and other substances. Lagoon design includes consideration of sludge accumulation, and lagoon management should include periodic measurement of the sludge layer's depth. When its accumulation becomes excessive, sludge must be removed.

The Natural Resources Conservation Service (NRCS) has a practice standard for lagoon management in North Carolina (Code 359) that requires an annual sludge survey after five years of lagoon operation, and the North Carolina Division of Water Quality (DWQ) often requires annual sludge surveys when it issues lagoon permits. This publication for lagoon managers and operators describes how to carry out a sludge survey and discusses sludge depth measurement, volume determination, and nutrient sampling. It draws upon and supplements the information in another publication on sludge management in anaerobic lagoons: *Sludge Management and Closure Procedures for Anaerobic Lagoons* (AG-604).

A sludge survey begins in a swine lagoon with two people in a flat-bottomed boat. The man holds a Sludge Gun, a Sludge Judge rests beside him, and a sonar device floats beside the boat.

REQUIREMENTS FOR SLUDGE SURVEYS

The NRCS Conservation Practice Standard for Waste Treatment Lagoons (Code 359) in North Carolina requires proper operation and maintenance of lagoons. Specifically, the standard states, "After five years, the sludge accumulation in the treatment lagoon shall be measured annually, or as needed, to define and document the rate of sludge accumulation in the lagoon and as directed by DWQ. If sludge accumulation in the treatment volume exceeds 50% of the planned treatment volume, the sludge should be either removed or the lagoon managed in accordance with an approved Sludge Management/Operation Plan as approved by DWQ."

Many permits for animal facilities issued by DWQ require a survey of sludge accumulation in lagoons within one year of receiving the individual permit or Certificate of Coverage (COC) and every year thereafter. The survey frequency may be reduced if it can be demonstrated to the satisfaction of DWQ that the rate of sludge accumulation does not warrant an annual survey. The survey shall include, but not be limited to, a sketch showing the depth of sludge in various locations within each lagoon. If the sludge accumulation is such that it reduces the lagoon's minimum treatment volume to less than 50 percent of the treatment volume for which the lagoon was designed, a plan must be submitted to the DWQ Central Office within 90 days of the determination. The plan must document the sludge-removal methods and waste-utilization procedures to be used.

SLUDGE CHARACTERISTICS

Two distinctly different zones occur within an anaerobic lagoon. First is the sludge accumulation zone at the bottom of the lagoon (Figure 1). The sludge is composed of settled manure solids, nonorganic constituents of manure, active and dead microbial cells, and other

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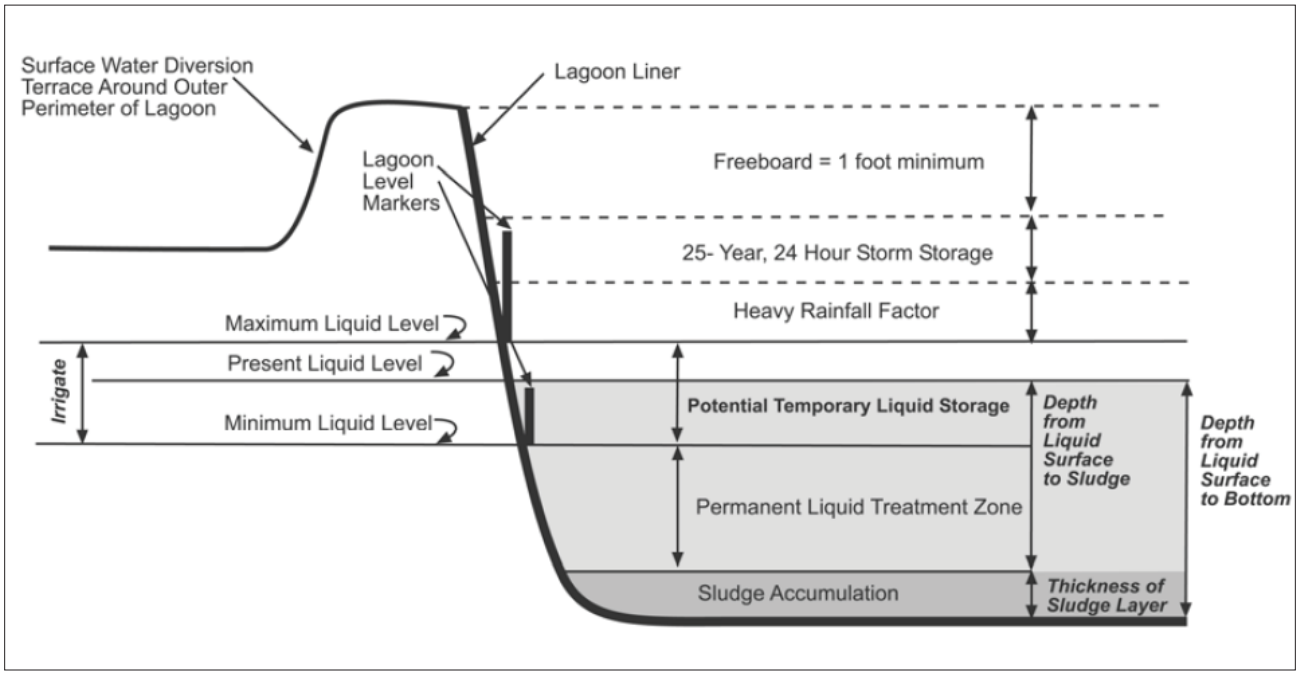

Figure 1. An anaerobic waste treatment lagoon (drawing is not to scale). (Adapted from AG-604)

materials (such as debris and sand) that entered the manure collection system and settled to the bottom. Sludge is black, moderately viscous, typically about 10 percent solids and 90 percent liquid, and high in nutrients, bacteria, and organic matter. Biological anaerobic degradation activity occurs in the sludge, as can be evidenced by the biogas that periodically floats sludge to the liquid surface. Sludge can be removed by pumps designed for 10 to 15 percent solids applications. Refer to *Sludge Management and Closure Procedures for Anaerobic Lagoons* (AG-604) for sludge-removal options.

The second distinct zone in the lagoon is the liquid layer above the sludge (Figure 1). This liquid, typically called lagoon supernatant or effluent, is low in solids (generally 0.3 to 0.6 percent solids), moderately rich in nutrients, and easily pumped with irrigation pumps. If the liquid and sludge are mixed, the solids content probably will be between 2 percent and 8 percent solids, depending on the proportion of sludge.

CONDUCTING A SLUDGE SURVEY—AN OVERVIEW

A sludge survey involves two steps: locating the top of the sludge layer and measuring its thickness at several locations in a lagoon. Both are discussed below in "Steps in the Sludge Survey" and "Measuring Sludge Layer Thickness." Using the measurements and Appendix 1, determine the thickness of the sludge layer and the thickness of the Permanent Liquid Treatment Zone (distance from the Minimum Liquid Level [Figure 1] to the top of the sludge layer). Appendix 2 is a Sludge Survey Data Sheet for recording measurements at each point of the survey grid. The volume of sludge and the fraction of the original liquid treatment zone that is filled with sludge can be estimated using Appendix 3. Appendix 4 is a conversion table that converts inches to tenths of a foot. If you anticipate that sludge removal might soon be required, take samples of the sludge or "cores" of the liquid column and sludge at the same time as the survey and send them for nutrient analyses.

Unless "remote" methods are developed, the sludge survey and sampling must be conducted from a boat on the lagoon. Special care should be taken when going onto a lagoon in a boat. For safety reasons, at least three people should be present: two in the boat and one on the lagoon bank. The extra person(s) on shore may be needed as a rescuer(s), should anything go awry. The extra person on the boat assists with getting in and out of the boat and anchoring the boat at the measurement locations. Also, it is more efficient if one person in the boat uses the measuring instruments and the other records the data. Flat-bottom or johnboats are preferred over canoes or V-bottom boats, as they are more stable. All persons working within the inner slopes of the lagoon, and especially those in the boat, should wear appropriate flotation devices.

The sludge layer is generally a "mobile" fluid, but it may form peaks and valleys within the lagoon. Small (usually

older) lagoons seem to have more variation in sludge layer thickness. For this reason, at least 8 depth measurements should be taken for a lagoon of less than 1.33 acres in area, and at least 6 measurements per acre should be taken for lagoons that are equal to or greater than 1.33 acres, up to a maximum of 24 for the whole lagoon. The locations for measurements should be determined by a uniform grid, if possible. Avoid measuring over the slope of the lagoon embankments. For example, if a lagoon is 12 feet deep and the side slope is 3:1 (horizontal to vertical), then the slope extends for 36 feet into the lagoon. In this case, the measurements should be taken more than 36 feet from the inside top of the lagoon embankment. All measurements from the various locations on the grid should be averaged to produce an average sludge layer thickness and to calculate the volume of sludge.

STEPS IN THE SLUDGE SURVEY

1. Gather the necessary people and equipment: boat, life jackets, paddles, anchor, map or sketch of lagoon, clipboard and pencils, sludge detection device (such as an infrared sensor or a disk-on-rope with interval markings [See "Measuring Sludge Layer Thickness"]) to determine the top of the sludge layer, and a solid rod or pole with interval markings to determine the depth to the lagoon bottom. A 12-foot johnboat with a trolling motor is recommended. There should be two people in the boat and one on the bank.
2. Determine the number of points at which to take measurements. Measure sludge at a minimum of 6 points per acre on a uniform grid, using 24 points maximum, or measure a minimum of 8 points if the lagoon is smaller than 1.33 acres. If you are unsure of the lagoon area, multiply the length times the width at the inside top of the bank and divide by 43,560 to get acres (1 acre = 43,560 sq ft). Multiply the number of acres by 6, and round to the nearest number that gives a uniform grid, with a minimum of 8 points for lagoons of less than 1.33 acres. Once the number of measurement points has been determined, set up a uniform grid on the lagoon sketch to show the location of those points. For a 1-acre lagoon twice as long as it is wide, 8 locations of about 60 feet by 50 feet would be marked on the grid (Figure 2). This sketch must be attached to the "Sludge Survey Data Sheet."
3. Use survey flags or landmarks (such as the inlet pipe, power pole, and confinement house) on the lagoon bank to mark lines corresponding to the grid developed in step 2.
4. Prepare data sheets and forms to record information (use the "Lagoon Sludge Survey Form" [Appendix 1] and "Sludge Survey Data Sheet" [Appendix 2] for recording information).
5. Launch the boat and move to the first sample point. Measure the depth from the surface of the liquid to the top of the sludge. Record this depth. Insert a pole

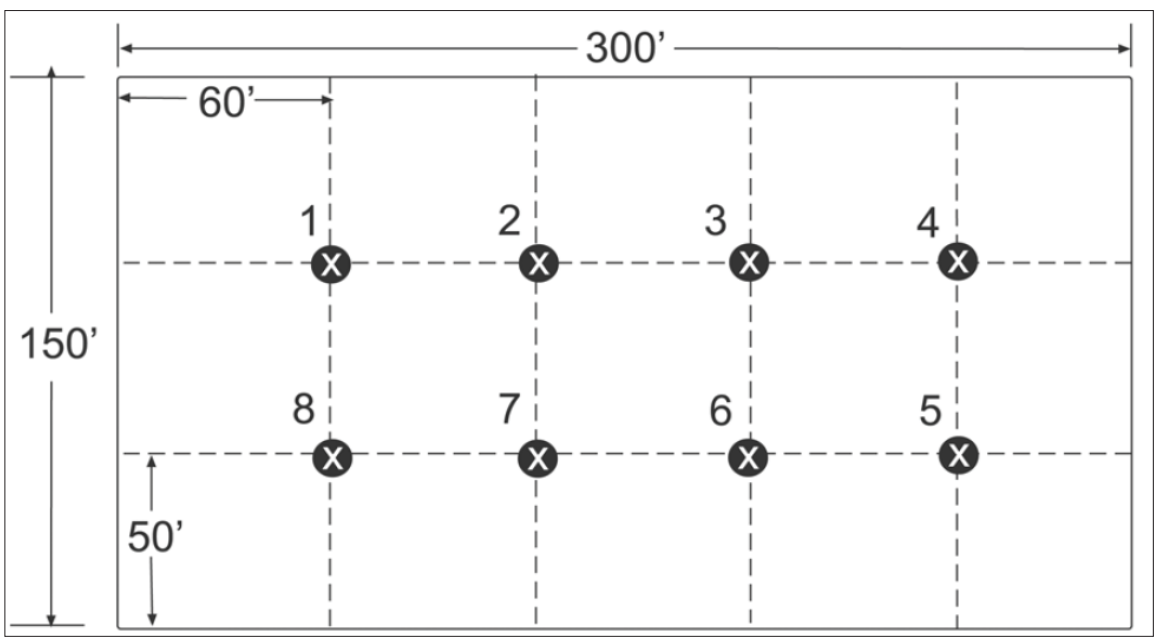

Figure 2. Layout for a lagoon 150 feet × 300 feet (1.03 acres), showing 8 locations to take sludge measurements (4 × 2 grid).

vertically at the same location until the lagoon bottom (soil contact) is felt. Record this depth. The sludge thickness is the difference between the two readings. If measurements are taken in feet and inches, convert to feet and tenths of a foot using the conversion table in Appendix 4.

6. Proceed to all other sample points, and record measurements as in item 5.
7. To determine the average sludge layer thickness in the lagoon, add all sludge layer thickness determinations and divide by the number of readings taken. This average sludge layer thickness will be used in the "Sludge Volume Worksheet" (Appendix 3) to determine how much sludge is in the lagoon. If the lagoon has an irregular shape, estimate the sludge volume by first estimating the total surface area in square feet and taking the square root to obtain the dimensions for a square lagoon. Then use the procedures in Appendix 3. If help is needed in determining the total surface area for an irregular shape, contact the local NRCS office.
8. For each survey, the Present Liquid Level should be referenced to a permanent elevation or benchmark, and the Maximum Liquid Level should be noted from the lagoon gauge. By knowing or measuring the difference in elevation between the Maximum Liquid Level and the Minimum Liquid Level on the lagoon gauges, the difference between the Minimum Liquid Level and the top of the sludge layer can be calculated. This is considered the existing Permanent Liquid Treatment Zone. This should be calculated and recorded on the "Lagoon Sludge Survey Form," Appendix 1. If the existing Permanent Liquid Treatment Zone is less than the existing sludge layer thickness, the volumes of the Treatment Zone and the Sludge layer must be calculated in Appendix 3.

MEASURING SLUDGE LAYER THICKNESS

Basic approach

Measure the depth from the liquid surface to the top of the sludge layer, and then measure the depth from the liquid surface to the lagoon bottom (soil contact); calculate the difference to obtain the thickness of the sludge layer.

Depth to top of the sludge

Various methods can be used to measure the depth from the liquid surface to the top of the sludge layer. Although some writers recommend a capped pipe or a pipe with a disk or a tee attached to the bottom to detect the sludge layer by "feel" (resistance from the sludge), these "feel" methods are likely to yield variable and inaccurate results. Although sludge is more viscous than the lagoon liquid, it is still difficult to feel when the sludge is first encountered. Therefore, "feel" methods are not recommended. Alternative methods that have proven to be more accurate include commercially available infrared sensors, a disk-on-rope device, a clear plastic pipe (such as the Sludge Judge) for obtaining a liquid column, or an electronic sonar depth finder.

Infrared sensors—Depth from the liquid surface to the top of the sludge layer can be measured reliably in most lagoons with infrared detectors, such as the Markland Engineering Sludge Gun or Raven Sludge Interface Detector. The infrared detectors indicate when the sludge layer is reached by emitting an audible sound. The sensitivity of the detectors can be adjusted, but in lagoons that have a high solids content, the detectors might sound as soon as the sensor is put into the liquid. If this occurs, another method may be needed to detect the top of the sludge layer. Infrared detectors cost between $750 and $1,000. ***Sources:*** **Sludge Gun (Sludge Blanket Level Detector) Model 10** from Markland Specialty Engineering Ltd. of Toronto, Canada, has a price, including shipment, of $875; it includes a 10-meter cable marked in feet. Markland recommends Model 10 HP ($995) for lagoons. Phone (416) 244-4980, e-mail: markland@sludgecontrols.com, or online at www.sludgecontrols.com. **Raven Sludge Interface Detector** made by Raven Environmental Products can be ordered from USA BlueBook (item MC-41441). Phone 1-800-548-1234. Price with a 20-foot line is about $750. The device has lights that illuminate and also makes an audible sound when the sludge layer is detected. Online at www.ravenep.com, or phone 1-800-545-6953,

Disk-on-rope—A much less expensive but somewhat more time-consuming method for detecting the top of the sludge layer is with a disk or plate that sinks through the liquid and settles on the sludge. When used carefully, this method generally agrees within 1 inch with the infrared detectors. A PVC disk ¼-inch thick and about 8 to 12 inches in diameter or of square shape (specific gravity = 1.4) has shown results consistent with the infrared detectors. The size (area) of the disk should make little difference because the pressure exerted on the sludge is constant per unit area. Disks of Lexan (specific gravity = 1.2) give similar results. Materials that are heavier than PVC could exert more pressure and penetrate the sludge.

The wire, rope, or string by which the infrared detectors or disks are lowered into the lagoon should be marked in inches or tenths of feet for easy reading. This line should

not be elastic because stretching will cause variations in readings. The disk should be lowered slowly to keep it from swaying off vertical line. Holes drilled in the disk to allow liquid to pass through may reduce swaying. The rope or string can be attached to the disk at the center or at 2 to 4 symmetrically placed locations to keep the disk more stable. The depth to the sludge layer should be measured with the disk before using a pole to measure depth to the lagoon bottom because the pole may disturb the sludge layer.

Sludge Judge or clear plastic pipe—These methods are also considered slightly less accurate for determining the top of the sludge layer. A Sludge Judge or similar clear plastic pipe with a valve at the bottom, if used carefully, can agree within 1 to 3 inches with the infrared and disk methods. Typically, however, the sludge does not flow freely into the pipe, and the reading indicates slightly less depth to the sludge than is actually present. Observe the liquid level inside the pipe as the Sludge Judge is slowly lowered into the lagoon. When the sludge layer is reached, the liquid level inside the pipe will drop slightly below the liquid level outside the pipe. Then, the Sludge Judge can be removed and the depth of the liquid column to the sludge can be recorded. (There will be at least 1 to 2 inches of sludge at the bottom end of the pipe to ensure that the sludge layer has been reached). The Sludge Judge costs $80 to $140 and can be ordered in either a ¾-inch or 1¼-inch outside diameter. ***Sources:*** **Sludge Judge** information can be found online at www.pollardwater.com. Pollard Water offers three models with prices of about $80 to $115 for a 15-foot length in three 5-foot sections; phone 1-800-437-1146. Wildlife Supply Co. at www.wildco.com also offers three types with prices of about $90 to $140 for a 15-foot length; phone 1-800-799-8301.

You can make an apparatus by attaching a ball valve with handle (operated by a rope) at the bottom of a clear plastic pipe. The pipe can be constructed of sections that can be disassembled for transport. The pipe can be as large as 2 inches in diameter, but it will be heavy to handle when collecting liquid and sludge. Experience shows that penetrating the sludge layer with an open pipe does not yield accurate thickness estimates of the sludge layer, probably because of sludge compression or clogging of the pipe. Either the Sludge Judge or a pipe you modify can be used to obtain a sludge sample for nutrient analysis.

Electronic sonar depth finder— The depth finders used by boaters and fishermen can also be used to determine the distance from a lagoon's liquid surface to its sludge layer. Only individuals who have experience with electronic sonar equipment set-up and operation should use this method. In addition, the operation of any equipment should be verified under lagoon conditions before actually being used on a boat in a lagoon.

Lagoon managers have built and used different versions of remotely controlled boats in conjunction with a fish finder. By utilizing global positioning system (GPS) technology in conjunction with the fish finder, both the location and depth to the top of the sludge layer can be recorded electronically. The recorded data can then be used to develop contour maps of the sludge or simply to calculate the average depth to sludge.

Fish finders and depth finders, which utilize sonar (sound, navigation and ranging) technology, transmit a high frequency signal from an antenna (called a transducer) and measure the time that it takes the signal to be reflected back to the transducer. The receiver then calculates the distance based on the time delay between the transmitted and reflected signals and the speed at which the signal travels in water (approximately 4,800 feet per second).

An experienced operator can obtain good results with a properly selected sonar unit. The results obtained from a sonar unit should be compared to results from another recommended method until the operator is confident of the results. A suitable unit will cost between $120 and $200. If additional features, such as GPS and a memory card, are desired, the cost may be considerably more. Here are some important considerations for selecting a sonar unit:

- Transmitter power – Higher power increases the likelihood that a signal will be reflected back to the transducer in lagoons with high solids content.
- Transducer – Narrow cone angles concentrate the signal into a smaller area and are preferable.
- Receiver – Manually adjustable controls, such as sensitivity, are important to reduce false readings, especially in lagoons with high solids content.
- Display – A graphic (picture) display with high resolution and good contrast is less likely than a digital display to produce false readings.

Also consider these factors when measuring with a sonar unit:

1. The relative location of the transducer to the surface of lagoon liquid should be recorded and the liquid level in the lagoon referenced to a fixed elevation (such as the start/stop pumping marker).
2. For the initial survey, a permanent grid should be determined and the lagoon bottom elevation should be measured with a pole or other method and recorded for each point on the grid.

3. If the sonar unit is be used on a large boat with an operator rather than a remotely controlled boat, the transducer is best mounted on a float independent of the boat so that it remains at a constant relative location to the liquid surface (i.e. it doesn't move up and down with a rocking boat). The distance from the transducer to the liquid surface should be recorded and added to the depth measurement if necessary.
4. Adjust the sensitivity to the lowest possible setting and turn off the fish identification feature, if the unit is so equipped, to reduce the interference from suspended solids.
5. Record the depth to the top of the sludge at each reference point.

Depth to the bottom of the lagoon

After the depth to the sludge layer has been measured, determine the depth from the liquid surface to the lagoon bottom at the same location. Use a ½-inch to 1-inch diameter pole marked off in inches or tenths of feet. It can be made of wood, aluminum, or PVC with end cap. Push the pole through the sludge until the bottom (soil) is reached. The pole should be held vertically and not be pushed into the soil; it should only make contact. The marked readings should begin at zero at the end inserted into the lagoon, so that the distance from the lagoon bottom to the liquid surface can be read directly. Poles may be constructed of sections that can be joined together, such as 4-foot lengths of PVC with joints, but the sections should always be assembled so that the depth indicators are accurate.

TAKING A SLUDGE SAMPLE

Samples of sludge or "cores" of the lagoon liquid and the sludge may be extracted for laboratory analysis of nutrient content either at the time of the lagoon survey or when a lagoon manager determines that sludge should be removed. Samples should be taken from several locations, then mixed into one composite sample.

How the sample is collected depends on how the sludge will be removed. If the lagoon will be agitated to mix lagoon liquid and sludge during sludge removal, a "core" of the mixed liquid and sludge should be taken. A Sludge Judge with a clear plastic tube and "float valve" at the bottom is a useful device for this task. Also, a 1½-inch diameter PVC pipe with a ball valve at the bottom and a handle operated by a rope can be used to take a core. However, the large-diameter pipe is difficult to manage because the pipe must be longer than the lagoon depth (liquid surface to lagoon soil bottom) and typically will be more than 10 feet long and heavy. Constructing a pipe of 4- to 5-foot sections will make the device easier to transport between lagoons and to store.

To obtain a liquid-and-sludge sample, open the valve and slowly insert the pipe vertically into the lagoon until it reaches the bottom. Then pull the rope to close the valve. Pull the pipe up out of the lagoon. This will capture a core

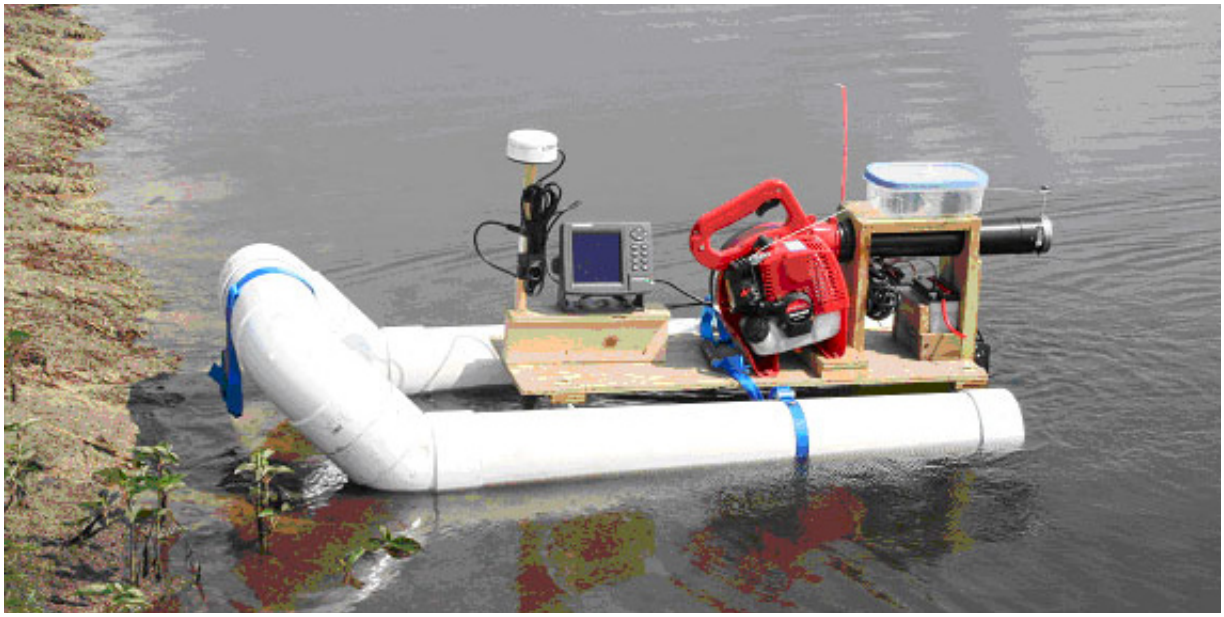

Figure 3. Remotely controlled sludge survey boat designed and built by Dan Bailey (Extension Agricultural Agent, Sampson County) utilizing a fish finder, GPS, and a gas-powered leaf blower for propulsion.

or profile of lagoon effluent and sludge. Empty the contents of the pipe into a clean 5-gallon bucket by opening the ball valve.

Place several samples in the bucket and mix thoroughly before removing a sub-sample for analysis. A wide-mouthed plastic bottle is a good container for shipping samples to the laboratory.

If the lagoon liquid is going to be drawn down and primarily only sludge pumped out, then only the sludge portion of the core of liquid and sludge should be released into the bucket and sampled. Another method of obtaining a sludge sample is with a "grab sampler," such as the Ekman Bottom Grab Sampler. ***Sources:*** The Ekman Bottom Grab Sampler is available from various sources, such as Wildlife Supply Co., online at www.wildco.com; phone 1-800-799-8301. Cost of a standard stainless steel sampler kit is $485.

If you are unsure of how the sludge will be removed, take a sample of sludge only and a sample of the sludge-and-liquid entire core, label them separately, and have both analyzed.

RESOURCES

For more information on preparing sludge samples for analysis, consult these publications:

Sheffield, R. E., J. C. Barker, and K. A. Shaffer. 2000. *Sludge Management and Closure Procedures for Anaerobic Lagoons* (AG-604). Raleigh: N.C. Cooperative Extension, N.C. State University. Online: http://www.bae.ncsu.edu/programs/extension/manure/ag604.pdf

Crouse, D. 2003. Tools for the Plan. In *Certification Training Manual for Operators of Animal Waste Management Systems*. Raleigh: Department of Soil Science, N.C. State University. Online: http://www.soil.ncsu.edu/certification/Manual/a/chapter4A.htm

Zublena, J. P. and C. R. Campbell. 1997. *Soil Facts: Waste Analysis* (AG-439-33). Raleigh: N.C. Cooperative Extension, N.C. State University. Online: http://www.soil.ncsu.edu/publications/Soilfacts/AG-439-33/

APPENDIX 1. LAGOON SLUDGE SURVEY FORM REVISED AUGUST 2008

A. Farm Permit or DWQ Identification Number_____

B. Lagoon Identification _____

C. Person(s) Taking Measurements _____

D. Date of Measurements _____

E. Methods/Devices Used for Measurement of:

a. Distance from the lagoon liquid surface to the top of the sludge layer: _____

b. Distance from the lagoon liquid surface to the bottom (soil) of the lagoon: _____

c. Thickness of the sludge layer if making a direct measurement with "core sampler":_____

F. Lagoon Surface Area (using dimensions at inside top of bank): _____(acres)

(Draw a sketch of the lagoon on a separate sheet, list dimensions, and calculate surface area. The lagoon may have been built differently than designed, so measurements should be made.)

G. Estimate number of sampling points:

a. Less than 1.33 acres: Use 8 points.

b. If more than 1.33 acres, _____ acres × 6 = _____, with maximum of 24.

(Using sketch and dimensions, develop a uniform grid that has the same number of intersections as the estimated number of sampling points needed. Number the intersection points on the lagoon grid so that data recorded at each can be easily matched.)

H. Conduct sludge survey and record data on "Sludge Survey Data Sheet" (Appendix 2). Also, at the location of the pump intake, take measurement of distance from liquid surface to top of sludge layer and record it on the Data Sheet (last row); this must be at least 2.5 ft when irrigating.

I. At the time of the sludge survey, also measure the distance from the Maximum Liquid Level to the Present Liquid Level (measure at the lagoon gauge pole): _____

J. Determine the distance from the top of bank to the Maximum Liquid Level: _____

(Use lagoon management plan or other lagoon records.)

K. Determine the distance from the Maximum Liquid Level to the Minimum Liquid Level: _____

(Use lagoon management plan or other lagoon records.)

L. Calculate the distance from the present liquid surface level to the Minimum Liquid Level: _____

(Item K minus Item I, assuming the present liquid level is below the Maximum Liquid Level.)

M. Record from the Sludge Survey Data Sheet the distance from the present liquid surface level to the lagoon bottom (average for all the measurement points): _____

N. Record from the Sludge Survey Data Sheet the distance from the present liquid surface level to the top of the sludge layer (average for all the measurement points): _____

O. Record from the Sludge Survey Data Sheet the average thickness of the sludge layer: _____

P. Calculate the thickness of the existing Liquid Treatment Zone (Item N minus Item L): _____

Q. If Item O is greater than Item P, proceed to the Worksheet for Sludge Volume and Treatment Volume. If Item O is equal to or less than Item P, you do not have to determine volumes.

Completed by: _____ _____ Date:_____

Print Name Signature

APPENDIX 2. SLUDGE SURVEY DATA SHEET* REVISED AUGUST 2008

Lagoon Identification: _____

Completed by: _____ _____ Date:_____
Print Name Signature

(A) Grid Point No.	(B) Distance from liquid surface to top of sludge		(C) Distance from liquid surface to lagoon bottom (soil)		(C) minus (B) Thickness of sludge layer	
	ft & in.	ft (tenths)	ft & in.	Ft (tenths)	ft & in.	ft (tenths)
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
Number of points with readings			X		X	
Average of points						
At pump intake			X	X	X	X

*All Grid Points and corresponding sludge layer thicknesses must be shown on a sketch attached to this Sludge Survey Data Sheet. See Appendix 4 for conversion from inches to tenths of a foot.

APPENDIX 3. WORKSHEET FOR SLUDGE VOLUME AND TREATMENT VOLUME REVISED AUGUST 2008

The average thickness of the sludge layer and the thickness of the existing liquid (sludge-free) treatment zone are determined from information on the Lagoon Sludge Survey Form (Items O and P, respectively). In this example, the average sludge layer thickness is 2.5 feet and the existing liquid treatment zone is 3.5 feet. If the lagoon has a designed sludge storage volume, see notes at end of the worksheet. The dimensions of the lagoon as measured and the side slope are needed for calculations of sludge volume and of total treatment volume. If the lagoon is a standard geometric shape, the sludge volume and treatment volume in the lagoon can be estimated by using standard equations. For approximate volumes of rectangular lagoons with constant side slope, calculate length and width at the midpoint of the layer, and multiply by layer thickness to calculate layer volume, as shown in the example. For irregular shapes, convert the total surface area to a square or rectangular shape. For exact volumes for lagoons with constant side slope, the "Prismoidal Equations" may be used.

	Example	Your lagoon
1. Average Sludge Layer Thickness (T)	2.5 ft	
2. Depth of lagoon from top of bank to bottom soil surface (D)	11 ft	
3. Slope = horizontal/vertical side slope (S)	3	
4. Length at top inside bank (L)	457 ft	
5. Width at top inside bank (W)	229 ft	
6. Length at midpoint of sludge layer: Lm = L – 2 S (D- (T/2))	398.5 ft	
7. Width at midpoint of sludge layer: Wm = W – 2 S (D – (T/2))	170.5 ft	
8. Volume of sludge (Vs): Vs = Lm Wm T	169,860 ft^3	
9. Volume in gallons (Vsg): Vsg = V * 7.5 gal/ft3	1,273,950 gal	
10. Thickness of existing liquid treatment zone (Y)	3.5 ft	
11. Thickness of total treatment zone (Z): Z = T + Y	6.0 ft	
12. Length at midpoint of total treatment zone: Lz = L – 2(S) (D – (Z/2)	409 ft	
13. Width at midpoint of total treatment zone: Wz = W – 2(S) (D – (Z/2)	181 ft	
14. Volume of total treatment zone (Vz): Vz = Lz Wz Z	444,174 ft^3	
15. Ratio (R) of sludge layer volume to total treatment volume: R = Vs/Vz If the ratio exceeds 0.50, than a sludge Plan of Action may be required. Check with DWQ for information on filing the Plan of Action.	0.38	

Note: If the lagoon has a designed sludge storage volume (DSSV), subtract that volume from both the volume of sludge (Vs) (Item 8) and from the volume of total treatment zone (Vz) (Item 14), and take the ratio:

$$R = (Vs - DSSV) / (Vz - DSSV)$$

Example: If DSSV = 85,000 ft^3, then R = (169,860 – 85,000) / (444,174 – 85,000)
R = 84,860 / 359,174 = 0.24

APPENDIX 4. CONVERSION TABLE FROM INCHES TO TENTHS OF A FOOT

Inches	Tenths of a foot	Inches	Tenths of a foot
1	0.1	7	0.6
2	0.2	8	0.7
3	0.2	9	0.7
4	0.3	10	0.8
5	0.4	11	0.9
6	0.5		

Prepared by

Philip W. Westerman, Professor, *Department of Biological and Agricultural Engineering*
Karl A. Shaffer, Extension Associate, *Department of Soil Science*
J. Mark Rice, Extension Specialist, *Department of Biological and Agricultural Engineering*

College of Agriculture & Life Sciences
North Carolina State University

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NC STATE UNIVERSITY

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Animal Feeding Operations :: Facility Map

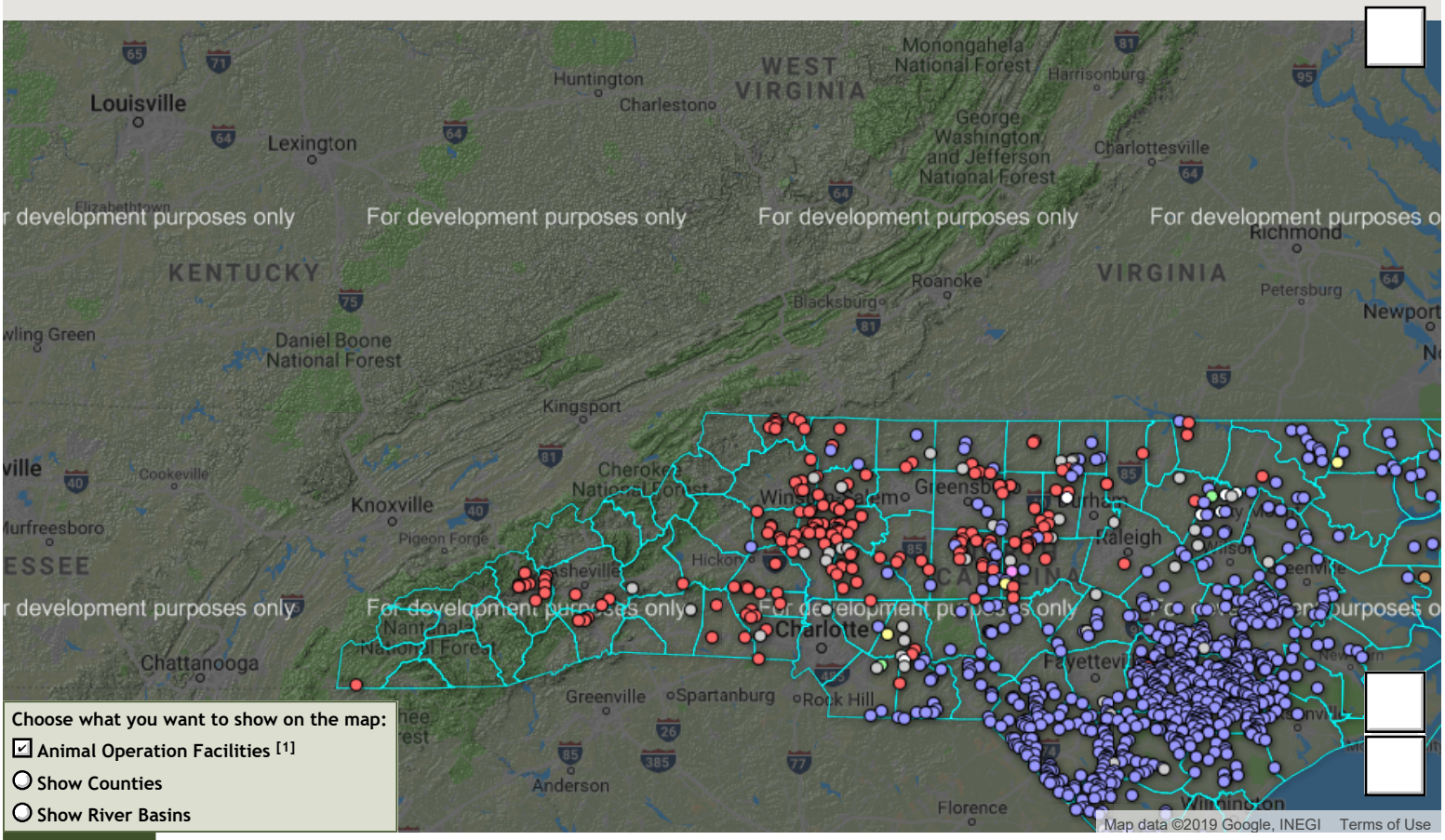
[Feedback

What do you want to search for?

List of Permitted Animal Facilities

To see more information about a facility, click on a marker:

[Reset]



Choose what you want to show on the map:

- [x] Animal Operation Facilities [1]
- ○ Show Counties
- ○ Show River Basins

Hide Choices

[1] Animal Operation Facility Types

- Swine State
- Swine NPDES
- Cattle State
- Cattle NPDES
- Wet Poultry NPDES
- Individual NPDES
- Individual State
- Wet Poultry State

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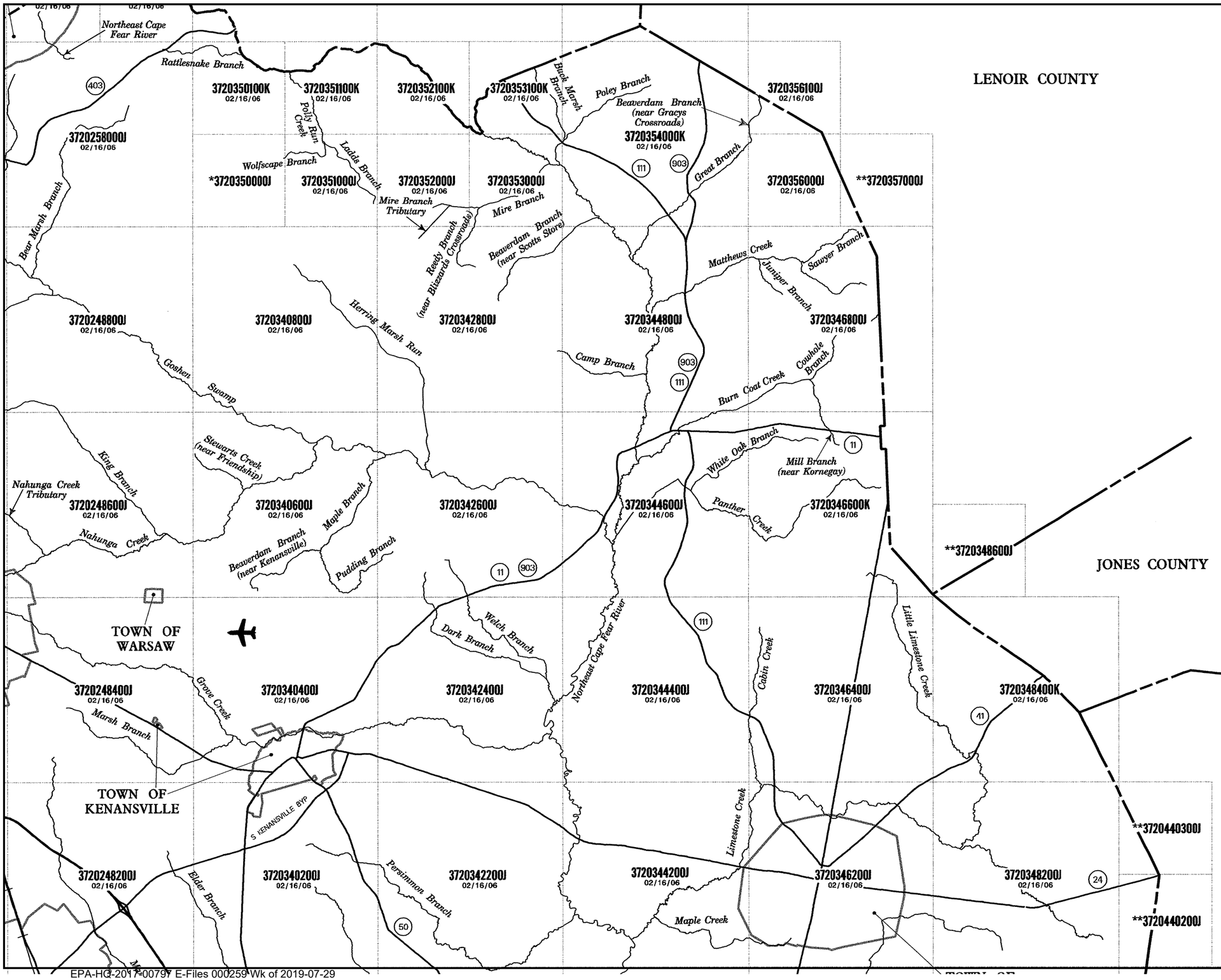

FIRM
FLOOD INSURANCE RATE MAP

DUPLIN COUNTY,
NORTH CAROLINA
AND INCORPORATED AREAS

(SEE LISTING OF COMMUNITIES TABLE)

MAP INDEX

PANEL PRINTED: 2344, 2346, 2348, 2365, 2366, 2368, 2375, 2385, 2386, 2387, 2388, 2395, 2396, 2397, 2440, 2442, 2446, 2448, 2460, 2462, 2464, 2466, 2468, 2480, 2482, 2484, 2486, 2488, 2540, 2542, 2552, 2560, 2580, 2582, 2592, 3305, 3306, 3307, 3308, 3315, 3316, 3317, 3325, 3326, 3328, 3335, 3344, 3346, 3348, 3364, 3366, 3368, 3386, 3388, 3400, 3402, 3404, 3406, 3408, 3420, 3422, 3424, 3426, 3428, 3440, 3442, 3444, 3446, 3448, 3460, 3462, 3464, 3466, 3468, 3480, 3482, 3484, 3501, 3502, 3510, 3511, 3520, 3521, 3530, 3531, 3540, 3560, 3561, 4400

MAP REVISED
FEBRUARY 16, 2007

MAP NUMBER
37061CIND0C

State of North Carolina
Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

State of North Carolina
Department of Environmental Quality
Division of Water Resources

Animal Feeding Operations Permit Application Form

(THIS FORM MAY BE PHOTOCOPIED FOR USE AS AN ORIGINAL)

New or Expanding Swine Animal Waste Management System Permit

1. GENERAL INFORMATION:

1.1 Facility name: _____

1.2 Print Land Owner's name: _____

1.3 Mailing address: _____

City, State: _____ Zip: _____

Telephone (include area code): (_____) _____ - _____ Fax: (____) _____- _____Email: _____

1.4 Physical address: _____

City, State: _____ Zip: _____

Telephone number (include area code): (_____) _____ - _____

1.5 County where facility is located: _____

1.6 Facility location (directions from nearest major highway, using SR numbers for state roads): _____

_____

1.7 Farm Manager's name (if different from Land Owner): _____

1.8 Lessee's / Integrator's name (if applicable; circle which type is listed): _____

1.9 Facility's original start-up date: _____ Date(s) of facility expansion(s) (if applicable): _____

2. OPERATION INFORMATION:

2.1 Facility number: _____

2.2 Operation Description:

Please enter the Design Capacity of the system. The "No. of Animals" should be the maximum number for which the current swine waste management system is permitted.

Type of Swine	No. of Animals
☐ Wean to Feeder	_____
☐ Feeder to Finish	_____
☐ Farrow to Wean (# sow)	_____
☐ Farrow to Feeder (# sow)	_____
☐ Farrow to Finish (# sow)	_____
☐ Wean to Finish (# sow)	_____
☐ Gilts	_____
☐ Boar/Stud	_____

☐ Other Type of Livestock on the farm: _____ No. of Animals: _____

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2.3 Acreage cleared and available for application (excluding all required buffers and areas not covered by the application system): _____ Required Acreage (as listed in the CAWMP): _____

2.4 Number of Earthen Structures: _____ Total Capacity (cubic feet): _____ Required Capacity (cubic feet): _____

Number of Storage Structures: _____ Total Capacity (cubic feet): _____ Required Capacity (cubic feet): _____

Number of Treatment Structure: _____ Total Capacity (cubic feet): _____ Required Capacity (cubic feet): _____

2.5 Are subsurface drains present within 100' of any of the application fields? **YES** or **NO** (circle one)

2.6 Are subsurface drains present in the vicinity or under the waste management system? **YES** or **NO** (circle one)

2.7 Does this facility meet all applicable siting requirements? **YES** or **NO** (circle one)

3. REQUIRED ITEMS CHECKLIST:

Please indicate that you have included the following required items by signing your initials in the space provided next to each item.

Applicants Initials

3.1 One completed and signed original and two copies of the application for Innovative Animal Waste Management System Application Form. _____

3.2 Three copies of a general location map indicating the location of the animal waste facilities and field locations where animal waste is land applied and a county road map with the location of the facility indicated. _____

3.3 Documentation that proposed swine facilities meet the Swine Farm Siting Act, including a site map prepared by a Registered Land Surveyor. The scale of this map shall not exceed 1 inch = 400 feet. At a minimum, the site map shall show the distance from the proposed houses and lagoons to occupied residences within 1500 feet, schools, hospitals, churches, outdoor recreational facilities, national parks, state parks, historic properties, or child care centers within 2500 feet, property boundaries within 500 feet, water supply wells within 500 feet. The map shall also show the location of any property boundaries and perennial streams or rivers located within 75 feet of waste application areas. _____

3.4 Documentation showing that all adjoining property owners, all property owners who own property located across a public road, street, or highway from the facility, the local health department, and the county manager or chair of the county board of commissioners if there is no county manager, have been notified by certified mail of your intent to construct or expand a swine farm at this location.

3.5 Three copies of the entire Certified Animal Waste Management Plan (CAWMP), including the PLAT evaluation. If the facility does not have a CAWMP, it must be completed prior to submittal of a permit application for animal waste operations. _____

3.6 Three copies of a detailed narrative, calculations and any relevant data for the Animal Waste Management System. The narrative and calculations must show how the waste management system will meet the following performance standards:

3.6.1 Eliminate the discharge of animal waste to surface waters and groundwater through direct discharge, seepage, or runoff. _____

- Storage time of waste prior to treatment
- Hydraulic conductivity (cm/sec) of any earthen treatment structures

3.6.2 Substantially eliminate the atmospheric emission of ammonia. The system must reduce emissions from the waste treatment and spray field by 80%. The system must also focus on reduction of emissions from the barns. _____

- % reduction of ammonia emissions from waste treatment structures
- % reduction of ammonia emissions from land application

- % reduction of ammonia emissions from barns

3.6.3 Substantially eliminate the emission of odor that is detectable at the property boundary, as defined by 15A NCAC 02D .1808. _____

3.6.4 Vectors and pathogens: Submit information documenting the reduction in fecal coliform _____

3.6.5 Heavy metal and nutrients _____
- Nitrogen mass to be land applied on site (kg N/1000 kg SSLW)
- Phosphorus mass to be land applied on site (kg N/1000 kg SSLW)
- Copper mass to be land applied on site (kg N/1000 kg SSLW)
- Zinc mass to be land applied on site (kg N/1000 kg SSLW)

3.7 Three copies of all engineering documents, including, but not limited to, calculations, equipment specifications, plan and profile drawings to scale, construction materials, supporting equations or justifications _____

3.8 The CAWMP **must** include the following components. *Some of these components may not have been required at the time the facility was certified but should be added to the CAWMP for permitting purposes*:

3.8.1 NRCS Site Evaluation Form NC-CPA-17 or equivalent
3.8.2 A hazard classification of the proposed lagoons, if required
3.8.3 A wetlands determination
3.8.4 The lagoon/storage facility design
3.8.5 Proposed runoff control measures, if required
3.8.6 Irrigation or other land application method design
3.8.7 The Waste Utilization Plan (WUP) must include the amount of Plant Available Nitrogen (PAN) produced and utilized by the facility
3.8.8 The soil series present on every waste disposal field
3.8.9 The crops grown on every waste disposal field
3.8.10 The Realistic Yield Expectation (RYE) for every crop shown in the WUP
3.8.11 The PAN applied to every waste disposal field
3.8.12 The waste application windows for every crop utilized in the WUP
3.8.13 The required NRCS Standard specifications
3.8.14 Emergency Action Plan
3.8.15 Insect Control Checklist with options noted
3.8.16 Odor Control Checklist with options noted
3.8.17 Mortality Control Checklist with options noted
3.8.18 A map showing the topography of the proposed facility location showing features that affect facility design, the dimensions and elevations of any existing facilities, the fields used for waste application, and areas where surface runoff is to be controlled

If your CAWMP includes any components not shown on this list, please include the additional components with your submittal. (Composting, waste transfers, etc.)

4. APPLICANT'S CERTIFICATION:

I, _____ (Land Owner's name listed in question 1.2), attest that

this application for _____(Facility name listed in question 1.1) has been reviewed by me and is accurate and complete to the best of my knowledge. I understand that if all required parts of this application are not completed and that if all required supporting information and attachments are not included, this application package will be returned to me as incomplete.

Signature _____ Date _____

5. MANAGER'S CERTIFICATION: (complete only if different from the Land Owner)

I, _____ (Manager's name listed in question 1.7), attest that this application for _____ _____(Facility name listed in question 1.1) has been reviewed by me and is accurate and complete to the best of my knowledge. I understand that if all required parts of this application are not completed and that if all required supporting information and attachments are not included, this application package will be returned as incomplete.

Signature _____ Date _____

THE COMPLETED APPLICATION PACKAGE, INCLUDING ALL SUPPORTING INFORMATION AND MATERIALS, SHOULD BE SENT TO THE FOLLOWING ADDRESS:

NORTH CAROLINA DIVISION OF WATER RESOURCES
WATER QUALITY REGIONAL OPERATIONS SECTION
ANIMAL FEEDING OPERATIONS PROGRAM
1636 MAIL SERVICE CENTER
RALEIGH, NORTH CAROLINA 27699-1636
TELEPHONE NUMBER: (919) 807-6464
FAX NUMBER: (919) 807-6496

6. SURFACE WATER CLASSIFICATION:

This form must be completed by the appropriate DWR regional office and included as a part of the project submittal information.

INSTRUCTIONS TO NC PROFESSIONALS:

The classification of the downslope surface waters (the surface waters that any overflow from the facility would flow toward) in which this animal waste management system will be operated must be determined by the appropriate DWR regional office. Therefore, you are required, **prior to submittal of the application package,** to submit this form, with items 1 through 6 completed, to the appropriate Division of Water Resources Regional Aquifer Protection Supervisor (see page 5 of 5). At a minimum, you must include an 8.5" by 11" copy of the portion of a 7.5 minute USGS Topographic Map which shows the location of this animal waste application system and the downslope surface waters in which they will be located. Identify the closest downslope surface waters on the attached map copy. **Once the regional office has completed the classification, reincorporate this completed page and the topographic map into the complete application form and submit the application package.**

6.1 Farm Name: _____

6.2 Name & complete address of engineering firm: _____

Telephone : (_____) _____ - Fax: (_____) _____-_____ Email: _____

6.3 Name of closest downslope surface waters: _____

6.4 County(ies) where the animal waste management system and surface waters are located_____

6.5 Map name and date: _____

6.6 NC Professional's Seal (If appropriate), Signature, and Date:

TO: REGIONAL AQUIFER PROTECTION SUPERVISOR

Please provide me with the classification of the watershed where this animal waste management facility will be or has been constructed or field located, as identified on the attached map segment(s):

Name of surface waters:_____

Classification (as established by the Environmental Management Commission):_____

Proposed classification, if applicable: _____

Signature of regional office personnel: _____ Date:_____

(All attachments must be signed)

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DIVISION OF WATER RESOURCES REGIONAL OFFICES (06/2008)

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450 Hanes Mill Road, Suite 300
Winston-Salem, NC 27105
Phone (336) 776-9800
Fax (336) 776-9797

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Caswell	Surry
Davidson	Watauga
Davie	Wilkes
Forsyth	Yadkin
Guilford	

State of North Carolina
Department of Environmental Quality
Division of Water Resources

Animal Feeding Operations Permit Application Form

(THIS FORM MAY BE PHOTOCOPIED FOR USE AS AN ORIGINAL)

NPDES General Permit - Existing Animal Waste Operations

1. GENERAL INFORMATION:

1.1 Facility name: _____

1.2 Print Land Owner's name: _____

1.3 Mailing address: _____

City, State: _____ Zip: _____

Telephone number (include area code): (_____) _____ - _____

1.4 Physical address: _____

City, State: _____ Zip: _____

Telephone number (include area code): (_____) _____ - _____

1.5 County where facility is located: _____

1.6 Owner's email address: _____

1.7 Facility location (directions from nearest major highway, using SR numbers for state roads): _____

1.8 Farm Manager's name (if different from Land Owner): _____

1.9 Lessee's / Integrator's name (if applicable; circle which type is listed): _____

1.10 Facility's original start-up date: _____ Date(s) of facility expansion(s) (if applicable): _____

2. OPERATION INFORMATION:

2.1 Facility number: _____

2.2 Operation Description:

Please enter the Design Capacity of the system. The "No. of Animals" should be the maximum number for which the waste management structures were designed.

Type of Swine	No. of Animals	Type of Poultry	No. of Animals	Type of Cattle	No. of Animals
☐ Wean to Feeder	_____	☐ Layer	_____	☐ Beef Brood Cow	_____
☐ Feeder to Finish	_____	☐ Non-Layer	_____	☐ Beef Feeder	_____
☐ Farrow to Wean (# sow)	_____	☐ Turkey	_____	☐ Beef Stocker Calf	_____
☐ Farrow to Feeder (# sow)	_____	☐ Turkey Poults	_____	☐ Dairy Calf	_____
☐ Farrow to Finish (# sow)	_____			☐ Dairy Heifer	_____
☐ Wean to Finish (# sow)	_____			☐ Dry Cow	_____
☐ Gilts	_____			☐ Milk Cow	_____
☐ Boar/Stud	_____				

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☐ Other Type of Livestock on the farm: _____ No. of Animals: _____

2.3 Acreage cleared and available for application (excluding all required buffers and areas not covered by the application system): _____ Required Acreage (as listed in the CAWMP): _____

2.4 Number of lagoons: _____ Total Capacity (cubic feet): _____ Required Capacity (cubic feet): _____

Number of Storage Ponds: _____ Total Capacity (cubic feet): _____ Required Capacity (cubic feet): _____

2.5 Are subsurface drains present within 100' of any of the application fields? **YES** or **NO** (circle one)

2.6 Are subsurface drains present in the vicinity or under the waste management system? **YES** or **NO** (circle one)

2.7 Does this facility meet all applicable siting requirements? **YES** or **NO** (circle one)

3. REQUIRED ITEMS CHECKLIST:

Please indicate that you have included the following required items by signing your initials in the space provided next to each item.

	Applicants Initials
3.1 One completed and signed original and one copy of the application for NPDES General Permit - Animal Waste Operations;	_____
3.2 Two copies of a general location map indicating the location of the animal waste facilities and field locations where animal waste is land applied and a county road map with the location of the facility indicated;	_____
3.3 Two copies of the entire Certified Animal Waste Management Plan (CAWMP). If the facility does not have a CAWMP, it must be completed prior to submittal of a permit application for animal waste operations.	_____

The CAWMP **must** include the following components. *Some of these components may not have been required at the time the facility was certified but must be added to the CAWMP for NPDES permitting purposes*:

3.3.1 The Waste Utilization Plan (WUP) must include the amount of Plant Available Nitrogen (PAN) and Phosphorus produced and utilized by the facility
3.3.2 The method by which waste is applied to the disposal fields (e.g. irrigation, injection, etc.)
3.3.3 A map of every field used for land application, with setbacks to surface waters or any conduits to surface waters (including field ditches), with the exception of grassed waterways that are designed and maintained according to NRCS standards.
3.3.4 The soil series present on every land application field
3.3.5 The crops grown on every land application field
3.3.6 The Realistic Yield Expectation (RYE) for every crop shown in the WUP
3.3.7 The PAN and Phosphorus applied to every land application field
3.3.8 The waste application windows for every crop utilized in the WUP
3.3.9 The required NRCS Standard specifications
3.3.10 A site schematic
3.3.11 Emergency Action Plan
3.3.12 Insect Control Checklist with chosen best management practices noted
3.3.13 Odor Control Checklist with chosen best management practices noted
3.3.14 Mortality Control Checklist with the selected method noted
3.3.15 Lagoon/storage pond capacity documentation (design, calculations, etc.); please be sure to include any site evaluations, wetland determinations, or hazard classifications that may be applicable to your facility
3.3.16 Operation and Maintenance Plan
3.3.17 Phosphorus Loss Assessment Tool (PLAT) Results, including the data sheets for each field.

If your CAWMP includes any components not shown on this list, please include the additional components with your submittal. (Composting, waste transfers, etc.)

4. APPLICANT'S CERTIFICATION:

I, _____ (Land Owner's name listed in question 1.2), attest that

this application for _____(Facility name listed in question 1.1) has been reviewed by me and is accurate and complete to the best of my knowledge. I understand that if all required parts of this application are not completed and that if all required supporting information and attachments are not included, this application package will be returned to me as incomplete.

Signature _____ Date _____

5. MANAGER'S CERTIFICATION: (complete only if different from the Land Owner)

I, _____ (Manager's name listed in question 1.6), attest that this

application for _____ _____(Facility name listed in question 1.1) has been reviewed by me and is accurate and complete to the best of my knowledge. I understand that if all required parts of this application are not completed and that if all required supporting information and attachments are not included, this application package will be returned as incomplete.

Signature _____ Date _____

THE COMPLETED APPLICATION PACKAGE, INCLUDING ALL SUPPORTING INFORMATION AND MATERIALS, SHOULD BE SENT TO THE FOLLOWING ADDRESS:

NORTH CAROLINA DIVISION OF WATER RESOURCES
WATER QUALITY REGIONAL OPERATIONS SECTION
ANIMAL FEEDING OPERATIONS PROGRAM
1636 MAIL SERVICE CENTER
RALEIGH, NORTH CAROLINA 27699-1636
TELEPHONE NUMBER: (919) 807-6464
FAX NUMBER: (919) 807-6496

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DIVISION OF WATER RESOURCES REGIONAL OFFICES (9/05)

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Fax (252) 975-3716

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Currituck	Perquimans
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Fax (704) 663-6040

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Gaston	Union
Iredell	

Wilmington Region WQROS Supervisor
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Wilmington, NC 28405-3845
(910) 796-7215
Fax (910) 350-2004

Brunswick	New Hanover
Carteret	Onslow
Columbus	Pender
Duplin	

Winston-Salem Regional WQROS Supervisor
450 Hanes Mill Road, Suite 300
Winston-Salem, NC 27105
Phone (336) 776-9800
Fax (336) 776-9797

Alamance	Rockingham
Alleghany	Randolph
Ashe	Stokes
Caswell	Surry
Davidson	Watauga
Davie	Wilkes
Forsyth	Yadkin
Guilford	

NC Department of Environment and Natural Resources

Water Quality - Animal Facility Map

Animal Feeding Operations :: Facility Map

[Feedback]

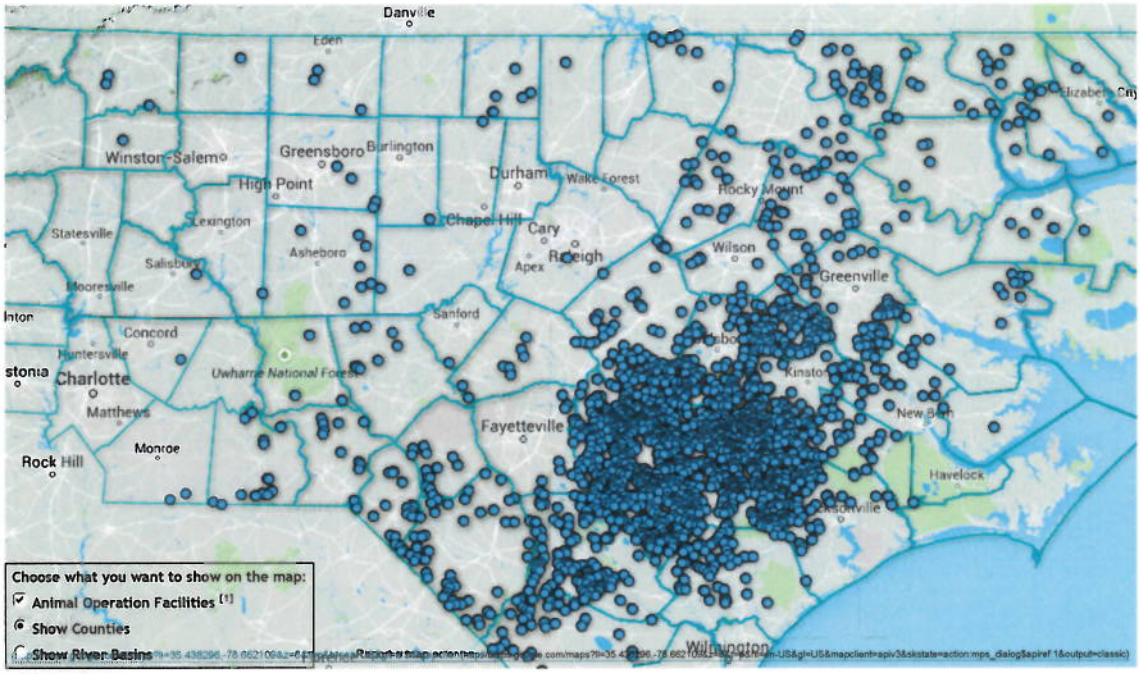
What do you want to search for? OK, now select a permit type: Now click this button to search:

(http://portal.ncdenr.org/c/document_library/get_file?uuid=ff6b878a-1fcf-47e4-8943-2d376f99fba4&groupId=38364)

Permit Type | Swine State | Search

To see more information about a facility, click on a marker:

[Reset]



Hide Choices

[1] Animal Operation Facility Types

- Swine State
- Swine NPDES
- Cattle State
- Cattle NPDES
- Wet Poultry NPDES
- Individual NPDES
- Individual State
- Wet Poultry State

N.C. Department of Environment and Natural Resources

1601 Mail Service Center, Raleigh, NC 27699-1601

Headquarters (Environment and Natural Resources Building): 217 W. Jones St.

Archdale Building: 512 N. Salisbury St.

Toll Free: (877) 623-6748

State of North Carolina
Department of Environmental Quality
Division of Water Resources

Animal Feeding Operations Permit Application Form

(THIS FORM MAY BE PHOTOCOPIED FOR USE AS AN ORIGINAL)

New or Expanding Swine Animal Waste Management System Permit

1. GENERAL INFORMATION:

1.1 Facility name: _____

1.2 Print Land Owner's name: _____

1.3 Mailing address: _____

City, State: _____ Zip: _____

Telephone (include area code): (_____) _____ - _____ Fax: (____) _____- _____Email: _____

1.4 Physical address: _____

City, State: _____ Zip: _____

Telephone number (include area code): (_____) _____ - _____

1.5 County where facility is located: _____

1.6 Facility location (directions from nearest major highway, using SR numbers for state roads): _____

_____

1.7 Farm Manager's name (if different from Land Owner): _____

1.8 Lessee's / Integrator's name (if applicable; circle which type is listed): _____

1.9 Facility's original start-up date: _____ Date(s) of facility expansion(s) (if applicable): _____

2. OPERATION INFORMATION:

2.1 Facility number: _____

2.2 Operation Description:

Please enter the Design Capacity of the system. The "No. of Animals" should be the maximum number for which the current swine waste management system is permitted.

Type of Swine	No. of Animals
☐ Wean to Feeder	_____
☐ Feeder to Finish	_____
☐ Farrow to Wean (# sow)	_____
☐ Farrow to Feeder (# sow)	_____
☐ Farrow to Finish (# sow)	_____
☐ Wean to Finish (# sow)	_____
☐ Gilts	_____
☐ Boar/Stud	_____

☐ Other Type of Livestock on the farm: _____ No. of Animals: _____

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2.3 Acreage cleared and available for application (excluding all required buffers and areas not covered by the application system): _____ Required Acreage (as listed in the CAWMP): _____

2.4 Number of Earthen Structures: _____ Total Capacity (cubic feet): _____ Required Capacity (cubic feet): _____

Number of Storage Structures: _____ Total Capacity (cubic feet): _____ Required Capacity (cubic feet): _____

Number of Treatment Structure: _____ Total Capacity (cubic feet): _____ Required Capacity (cubic feet): _____

2.5 Are subsurface drains present within 100' of any of the application fields? **YES** or **NO** (circle one)

2.6 Are subsurface drains present in the vicinity or under the waste management system? **YES** or **NO** (circle one)

2.7 Does this facility meet all applicable siting requirements? **YES** or **NO** (circle one)

3. REQUIRED ITEMS CHECKLIST:

Please indicate that you have included the following required items by signing your initials in the space provided next to each item.

Applicants Initials

3.1 One completed and signed original and two copies of the application for Innovative Animal Waste Management System Application Form. _____

3.2 Three copies of a general location map indicating the location of the animal waste facilities and field locations where animal waste is land applied and a county road map with the location of the facility indicated. _____

3.3 Documentation that proposed swine facilities meet the Swine Farm Siting Act, including a site map prepared by a Registered Land Surveyor. The scale of this map shall not exceed 1 inch = 400 feet. At a minimum, the site map shall show the distance from the proposed houses and lagoons to occupied residences within 1500 feet, schools, hospitals, churches, outdoor recreational facilities, national parks, state parks, historic properties, or child care centers within 2500 feet, property boundaries within 500 feet, water supply wells within 500 feet. The map shall also show the location of any property boundaries and perennial streams or rivers located within 75 feet of waste application areas. _____

3.4 Documentation showing that all adjoining property owners, all property owners who own property located across a public road, street, or highway from the facility, the local health department, and the county manager or chair of the county board of commissioners if there is no county manager, have been notified by certified mail of your intent to construct or expand a swine farm at this location.

3.5 Three copies of the entire Certified Animal Waste Management Plan (CAWMP), including the PLAT evaluation. If the facility does not have a CAWMP, it must be completed prior to submittal of a permit application for animal waste operations. _____

3.6 Three copies of a detailed narrative, calculations and any relevant data for the Animal Waste Management System. The narrative and calculations must show how the waste management system will meet the following performance standards:

3.6.1 Eliminate the discharge of animal waste to surface waters and groundwater through direct discharge, seepage, or runoff. _____

- Storage time of waste prior to treatment
- Hydraulic conductivity (cm/sec) of any earthen treatment structures

3.6.2 Substantially eliminate the atmospheric emission of ammonia. The system must reduce emissions from the waste treatment and spray field by 80%. The system must also focus on reduction of emissions from the barns. _____

- % reduction of ammonia emissions from waste treatment structures
- % reduction of ammonia emissions from land application

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- % reduction of ammonia emissions from barns

3.6.3 Substantially eliminate the emission of odor that is detectable at the property boundary, as defined by 15A NCAC 02D .1808. _____

3.6.4 Vectors and pathogens: Submit information documenting the reduction in fecal coliform _____

3.6.5 Heavy metal and nutrients _____
- Nitrogen mass to be land applied on site (kg N/1000 kg SSLW)
- Phosphorus mass to be land applied on site (kg N/1000 kg SSLW)
- Copper mass to be land applied on site (kg N/1000 kg SSLW)
- Zinc mass to be land applied on site (kg N/1000 kg SSLW)

3.7 Three copies of all engineering documents, including, but not limited to, calculations, equipment specifications, plan and profile drawings to scale, construction materials, supporting equations or justifications _____

3.8 The CAWMP **must** include the following components. *Some of these components may not have been required at the time the facility was certified but should be added to the CAWMP for permitting purposes*:

3.8.1 NRCS Site Evaluation Form NC-CPA-17 or equivalent
3.8.2 A hazard classification of the proposed lagoons, if required
3.8.3 A wetlands determination
3.8.4 The lagoon/storage facility design
3.8.5 Proposed runoff control measures, if required
3.8.6 Irrigation or other land application method design
3.8.7 The Waste Utilization Plan (WUP) must include the amount of Plant Available Nitrogen (PAN) produced and utilized by the facility
3.8.8 The soil series present on every waste disposal field
3.8.9 The crops grown on every waste disposal field
3.8.10 The Realistic Yield Expectation (RYE) for every crop shown in the WUP
3.8.11 The PAN applied to every waste disposal field
3.8.12 The waste application windows for every crop utilized in the WUP
3.8.13 The required NRCS Standard specifications
3.8.14 Emergency Action Plan
3.8.15 Insect Control Checklist with options noted
3.8.16 Odor Control Checklist with options noted
3.8.17 Mortality Control Checklist with options noted
3.8.18 A map showing the topography of the proposed facility location showing features that affect facility design, the dimensions and elevations of any existing facilities, the fields used for waste application, and areas where surface runoff is to be controlled

If your CAWMP includes any components not shown on this list, please include the additional components with your submittal. (Composting, waste transfers, etc.)

4. APPLICANT'S CERTIFICATION:

I, _____ (Land Owner's name listed in question 1.2), attest that

this application for _____(Facility name listed in question 1.1) has been reviewed by me and is accurate and complete to the best of my knowledge. I understand that if all required parts of this application are not completed and that if all required supporting information and attachments are not included, this application package will be returned to me as incomplete.

Signature _____ Date _____

5. MANAGER'S CERTIFICATION: (complete only if different from the Land Owner)

I, _____ (Manager's name listed in question 1.7), attest that this application for _____ _____(Facility name listed in question 1.1) has been reviewed by me and is accurate and complete to the best of my knowledge. I understand that if all required parts of this application are not completed and that if all required supporting information and attachments are not included, this application package will be returned as incomplete.

Signature _____ Date _____

THE COMPLETED APPLICATION PACKAGE, INCLUDING ALL SUPPORTING INFORMATION AND MATERIALS, SHOULD BE SENT TO THE FOLLOWING ADDRESS:

NORTH CAROLINA DIVISION OF WATER RESOURCES
WATER QUALITY REGIONAL OPERATIONS SECTION
ANIMAL FEEDING OPERATIONS PROGRAM
1636 MAIL SERVICE CENTER
RALEIGH, NORTH CAROLINA 27699-1636
TELEPHONE NUMBER: (919) 807-6464
FAX NUMBER: (919) 807-6496

6. SURFACE WATER CLASSIFICATION:

This form must be completed by the appropriate DWR regional office and included as a part of the project submittal information.

INSTRUCTIONS TO NC PROFESSIONALS:

The classification of the downslope surface waters (the surface waters that any overflow from the facility would flow toward) in which this animal waste management system will be operated must be determined by the appropriate DWR regional office. Therefore, you are required, **prior to submittal of the application package,** to submit this form, with items 1 through 6 completed, to the appropriate Division of Water Resources, Water Quality Regional Operations Supervisor (see page 5 of 5). At a minimum, you must include an 8.5" by 11" copy of the portion of a 7.5 minute USGS Topographic Map which shows the location of this animal waste application system and the downslope surface waters in which they will be located. Identify the closest downslope surface waters on the attached map copy. **Once the regional office has completed the classification, reincorporate this completed page and the topographic map into the complete application form and submit the application package.**

6.1 Farm Name: _____

6.2 Name & complete address of engineering firm: _____

Telephone : (_____) _____ - Fax: (_____) _____-_____ Email: _____

6.3 Name of closest downslope surface waters: _____

6.4 County(ies) where the animal waste management system and surface waters are located_____

6.5 Map name and date: _____

6.6 NC Professional's Seal (If appropriate), Signature, and Date:

TO: REGIONAL AQUIFER PROTECTION SUPERVISOR

Please provide me with the classification of the watershed where this animal waste management facility will be or has been constructed or field located, as identified on the attached map segment(s):

Name of surface waters:_____

Classification (as established by the Environmental Management Commission):_____

Proposed classification, if applicable: _____

Signature of regional office personnel: _____ Date:_____

(All attachments must be signed)

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DIVISION OF WATER RESOURCES REGIONAL OFFICES (06/2008)

Asheville Regional WQROS Supervisor
2090 U.S. Highway 70
Swannanoa, NC 28778
(828) 296-4500
Fax (828) 299-7043

Avery	Macon
Buncombe	Madison
Burke	McDowell
Caldwell	Mitchell
Cherokee	Polk
Clay	Rutherford
Graham	Swain
Haywood	Transylvania
Henderson	Yancey
Jackson	

Washington Regional WQROS Supervisor
943 Washington Square Mall
Washington, NC 27889
(252) 946-6481
Fax (252) 975-3716

Beaufort	Jones
Bertie	Lenoir
Camden	Martin
Chowan	Pamlico
Craven	Pasquotank
Currituck	Perquimans
Dare	Pitt
Gates	Tyrell
Greene	Washington
Hertford	Wayne
Hyde	

Raleigh Regional WQROS Supervisor
1628 Mail Service Center
Raleigh, NC 27699-1628
(919) 791-4200
Fax (919) 571-4718

Chatham	Nash
Durham	Northampton
Edgecombe	Orange
Franklin	Person
Granville	Vance
Halifax	Wake
Johnston	Warren
Lee	Wilson

Fayetteville Regional WQROS Supervisor
225 Green Street, Suite 714
Fayetteville, NC 28301-5094
(910) 433-3300
Fax (910) 486-0707

Anson	Moore
Bladen	Richmond
Cumberland	Robeson
Harnett	Sampson
Hoke	Scotland
Montgomery	

Mooresville Regional WQROS Supervisor
610 East Center Avenue
Mooresville, NC 28115
(704) 663-1699
Fax (704) 663-6040

Alexander	Lincoln
Cabarrus	Mecklenburg
Catawba	Rowan
Cleveland	Stanly
Gaston	Union
Iredell	

Wilmington Region WQROS Supervisor
127 Cardinal Drive Extension
Wilmington, NC 28405-3845
(910) 796-7215
Fax (910) 350-2004

Brunswick	New Hanover
Carteret	Onslow
Columbus	Pender
Duplin	

Winston-Salem Regional WQROS Supervisor
450 Hanes Mill Road, Suite 300
Winston-Salem, NC 27105
Phone (336) 776-9800
Fax (336) 776-9797

Alamance	Rockingham
Alleghany	Randolph
Ashe	Stokes
Caswell	Surry
Davidson	Watauga
Davie	Wilkes
Forsyth	Yadkin
Guilford	

State of North Carolina
Department of Environmental Quality
Division of Water Resources

Animal Feeding Operations Permit Application Form

(THIS FORM MAY BE PHOTOCOPIED FOR USE AS AN ORIGINAL)

NPDES General Permit – New or Expanding Animal Waste Operations

1. GENERAL INFORMATION:

1.1 Facility name: _____

1.2 Print Land Owner's name: _____

1.3 Mailing address: _____

City, State: _____ Zip: _____

Telephone number (include area code): (_____) _____ - _____

1.4 Physical address: _____

City, State: _____ Zip: _____

Telephone number (include area code): (_____) _____ - _____

1.5 County where facility is located: _____

1.6 Facility location (directions from nearest major highway, using SR numbers for state roads): _____

1.7 Farm Manager's name (if different from Land Owner): _____

1.8 Lessee's / Integrator's name (if applicable; circle which type is listed): _____

1.9 Facility's original start-up date: _____ Date(s) of facility expansion(s) (if applicable): _____

2. OPERATION INFORMATION:

2.1 Facility number: _____

2.2 Operation Description:

Please enter the Design Capacity of the system. The "No. of Animals" should be the maximum number for which the waste management structures were designed.

Type of Swine	No. of Animals	Type of Poultry	No. of Animals	Type of Cattle	No. of Animals
☐ Wean to Feeder	_____	☐ Layer	_____	☐ Beef Brood Cow	_____
☐ Feeder to Finish	_____	☐ Non-Layer	_____	☐ Beef Feeder	_____
☐ Farrow to Wean (# sow)	_____	☐ Turkey	_____	☐ Beef Stocker Calf	_____
☐ Farrow to Feeder (# sow)	_____	☐ Turkey Poults	_____	☐ Dairy Calf	_____
☐ Farrow to Finish (# sow)	_____			☐ Dairy Heifer	_____
☐ Wean to Finish (# sow)	_____			☐ Dry Cow	_____
☐ Gilts	_____			☐ Milk Cow	_____
☐ Boar/Stud	_____				

☐ Other Type of Livestock on the farm: _____ No. of Animals: _____

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2.3 Acreage cleared and available for application (excluding all required buffers and areas not covered by the application system): _____ Required Acreage (as listed in the CAWMP): _____

2.4 Number of lagoons: _____ Total Capacity (cubic feet): _____ Required Capacity (cubic feet): _____

Number of Storage Ponds: _____ Total Capacity (cubic feet): _____ Required Capacity (cubic feet): _____

2.5 Are subsurface drains present within 100' of any of the application fields? **YES** or **NO** (circle one)

2.6 Are subsurface drains present in the vicinity or under the waste management system? **YES** or **NO** (circle one)

2.7 Does this facility meet all applicable siting requirements? **YES** or **NO** (circle one)

3. REQUIRED ITEMS CHECKLIST:

Please indicate that you have included the following required items by signing your initials in the space provided next to each item.

Applicants Initials

3.1 One completed and signed original and two copies of the application for NPDES General Permit - Animal Waste Operations; _____

3.2 Three copies of a general location map indicating the location of the animal waste facilities and field locations where animal waste is land applied and a county road map with the location of the facility indicated; _____

3.3 Three copies of the entire Certified Animal Waste Management Plan (CAWMP). If the facility does not have a CAWMP, it must be completed prior to submittal of a permit application for animal waste operations. _____

The CAWMP **must** include the following components. *Some of these components may not have been required at the time the facility was certified but should be added to the CAWMP for permitting purposes*:

3.3.1 NRCS Site Evaluation Form NC-CPA-17 or equivalent
3.3.2 A hazard classification of the proposed lagoons, if required
3.3.3 Documentation that proposed swine facilities meet the Swine Farm Siting Act, including a site map prepared by a Registered Land Surveyor. The scale of this map shall not exceed 1 inch = 400 feet. At a minimum, the site map shall show the distance from the proposed houses and lagoons to occupied residences within 1500 feet, schools, hospitals, churches, outdoor recreational facilities, national parks, state parks, historic properties, or child care centers within 2500 feet, property boundaries within 500 feet, water supply wells within 500 feet. The map shall also show the location of any property boundaries and perennial streams or rivers located within 75 feet of waste application areas.
3.3.4 Documentation showing that all adjoining property owners, all property owners who own property located across a public road, street, or highway from the facility, the local health department, and the county manager or chair of the county board of commissioners if there is no county manager, have been notified by certified mail of your intent to construct or expand a swine farm at this location.
3.3.5 A wetlands determination
3.3.6 The lagoon/storage facility design
3.3.7 Proposed runoff control measures, if required
3.3.8 Irrigation or other land application method design
3.3.9 The Waste Utilization Plan (WUP) must include the amount of Plant Available Nitrogen (PAN) produced and utilized by the facility
3.3.10 The soil series present on every waste disposal field
3.3.11 The crops grown on every waste disposal field
3.3.12 The Realistic Yield Expectation (RYE) for every crop shown in the WUP
3.3.13 The PAN applied to every waste disposal field
3.3.14 The waste application windows for every crop utilized in the WUP
3.3.15 The required NRCS Standard specifications

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3.3.16 Emergency Action Plan
3.3.17 Insect Control Checklist with options noted
3.3.18 Odor Control Checklist with options noted
3.3.19 Mortality Control Checklist with options noted
3.3.20 Documentation proving this facility is exempt from the Moritoria on Construction or Expansion of Swine Farms, if the application is for a swine facility
3.3.21 A map showing the topography of the proposed facility location showing features that affect facility design, the dimensions and elevations of any existing facilities, the fields used for waste application, and areas where surface runoff is to be controlled

If your CAWMP includes any components not shown on this list, please include the additional components with your submittal. (Composting, waste transfers, etc.)

4. APPLICANT'S CERTIFICATION:

I, _____ (Land Owner's name listed in question 1.2), attest that

this application for _____(Facility name listed in question 1.1) has been reviewed by me and is accurate and complete to the best of my knowledge. I understand that if all required parts of this application are not completed and that if all required supporting information and attachments are not included, this application package will be returned to me as incomplete.

Signature _____ Date _____

5. MANAGER'S CERTIFICATION: (complete only if different from the Land Owner)

I, _____ (Manager's name listed in question 1.6), attest that this

application for _____ _____(Facility name listed in question 1.1) has been reviewed by me and is accurate and complete to the best of my knowledge. I understand that if all required parts of this application are not completed and that if all required supporting information and attachments are not included, this application package will be returned as incomplete.

Signature _____ Date _____

THE COMPLETED APPLICATION PACKAGE, INCLUDING ALL SUPPORTING INFORMATION AND MATERIALS, SHOULD BE SENT TO THE FOLLOWING ADDRESS:

NORTH CAROLINA DIVISION OF WATER RESOURCES
WATER QUALITY REGIONAL OPERATIONS SECTION
ANIMAL FEEDING OPERATIONS PROGRAM
1636 MAIL SERVICE CENTER
RALEIGH, NORTH CAROLINA 27699-1636
TELEPHONE NUMBER: (919) 807-6464
FAX NUMBER: (919) 807-6496

6. SURFACE WATER CLASSIFICATION:

This form must be completed by the appropriate DWR regional office and included as a part of the project submittal information.

INSTRUCTIONS TO NC PROFESSIONALS:

The classification of the downslope surface waters (the surface waters that any overflow from the facility would flow toward) in which this animal waste management system will be operated must be determined by the appropriate DWR regional office. Therefore, you are required, **prior to submittal of the application package,** to submit this form, with items 1 through 6 completed, to the appropriate Division of Water Resources, Water Quality Regional Operations Supervisor (see page 6 of 10). At a minimum, you must include an 8.5" by 11" copy of the portion of a 7.5 minute USGS Topographic Map which shows the location of this animal waste application system and the downslope surface waters in which they will be located. Identify the closest downslope surface waters on the attached map copy. **Once the regional office has completed the classification, reincorporate this completed page and the topographic map into the complete application form and submit the application package.**

6.1 Farm Name: _____

6.2 Name & complete address of engineering firm: _____

Telephone number: (_____) _____ - _____

6.3 Name of closest downslope surface waters: _____

6.4 County(ies) where the animal waste management system and surface waters are located_____

6.5 Map name and date: _____

6.6 NC Professional's Seal (If appropriate), Signature, and Date:

TO: REGIONAL AQUIFER PROTECTION SUPERVISOR

Please provide me with the classification of the watershed where this animal waste management facility will be or has been constructed or field located, as identified on the attached map segment(s):

Name of surface waters:_____

Classification (as established by the Environmental Management Commission):_____

Proposed classification, if applicable: _____

Signature of regional office personnel: _____ Date:_____

(All attachments must be signed)

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DIVISION OF WATER RESOURCES REGIONAL OFFICES (9/05)

Asheville Regional WQROS Supervisor
2090 U.S. Highway 70
Swannanoa, NC 28778
(828) 296-4500
Fax (828) 299-7043

Avery
Buncombe
Burke
Caldwell
Cherokee
Clay
Graham
Haywood
Henderson
Jackson
Macon
Madison
McDowell
Mitchell
Polk
Rutherford
Swain
Transylvania
Yancey

Washington Regional WQROS Supervisor
943 Washington Square Mall
Washington, NC 27889
(252) 946-6481
Fax (252) 975-3716

Beaufort
Bertie
Camden
Chowan
Craven
Currituck
Dare
Gates
Greene
Hertford
Hyde
Jones
Lenoir
Martin
Pamlico
Pasquotank
Perquimans
Pitt
Tyrell
Washington
Wayne

Raleigh Regional WQROS Supervisor
1628 Mail Service Center
Raleigh, NC 27699-1628
(919) 791-4200
Fax (919) 571-4718

Chatham
Durham
Edgecombe
Franklin
Granville
Halifax
Johnston
Lee
Nash
Northampton
Orange
Person
Vance
Wake
Warren
Wilson

Fayetteville Regional WQROS Supervisor
225 Green Street, Suite 714
Fayetteville, NC 28301-5094
(910) 486-1541
Fax (910) 486-0707

Anson
Bladen
Cumberland
Harnett
Hoke
Montgomery
Moore
Richmond
Robeson
Sampson
Scotland

Mooresville Regional WQROS Supervisor
610 East Center Avenue
Mooresville, NC 28115
(704) 663-1699
Fax (704) 663-6040

Alexander
Cabarrus
Catawba
Cleveland
Gaston
Iredell
Lincoln
Mecklenburg
Rowan
Stanly
Union

Wilmington Region WQROS Supervisor
127 Cardinal Drive Extension
Wilmington, NC 28405-3845
(910) 796-7215
Fax (910) 350-2004

Brunswick
Carteret
Columbus
Duplin
New Hanover
Onslow
Pender

Winston-Salem Regional WQROS Supervisor
450 Hanes Mill Road, Suite 300
Winston-Salem, NC 27105
Phone (336) 776-9800
Fax (336) 776-9797

Alamance
Alleghany
Ashe
Caswell
Davidson
Davie
Forsyth
Guilford
Rockingham
Randolph
Stokes
Surry
Watauga
Wilkes
Yadkin

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State of North Carolina
Department of Environmental Quality
Division of Water Resources

Animal Feeding Operations Permit Application Form

(THIS FORM MAY BE PHOTOCOPIED FOR USE AS AN ORIGINAL)

NPDES Individual Permit - Existing Animal Waste Operations

1. GENERAL INFORMATION:

1.1 Facility name: _____

1.2 Print Land Owner's name: _____

1.3 Mailing address: _____

City, State: _____ Zip: _____

Telephone number (include area code): (_____) _____ - _____

1.4 Physical address: _____

City, State: _____ Zip: _____

Telephone number (include area code): (_____) _____ - _____

1.5 County where facility is located: _____

1.6 Facility location (directions from nearest major highway, using SR numbers for state roads): _____

1.7 Farm Manager's name (if different from Land Owner): _____

1.8 Lessee's / Integrator's name (if applicable; circle which type is listed): _____

1.9 Facility's original start-up date: _____ Date(s) of facility expansion(s) (if applicable): _____

2. OPERATION INFORMATION:

2.1 Facility number: _____

2.2 Operation Description:

Please enter the Design Capacity of the system. The "No. of Animals" should be the maximum number for which the waste management structures were designed.

Type of Swine	No. of Animals	Type of Poultry	No. of Animals	Type of Cattle	No. of Animals
☐ Wean to Feeder	_____	☐ Layer	_____	☐ Beef Brood Cow	_____
☐ Feeder to Finish	_____	☐ Non-Layer	_____	☐ Beef Feeder	_____
☐ Farrow to Wean (# sow)	_____	☐ Turkey	_____	☐ Beef Stocker Calf	_____
☐ Farrow to Feeder (# sow)	_____	☐ Turkey Poults	_____	☐ Dairy Calf	_____
☐ Farrow to Finish (# sow)	_____			☐ Dairy Heifer	_____
☐ Wean to Finish (# sow)	_____			☐ Dry Cow	_____
☐ Gilts	_____			☐ Milk Cow	_____
☐ Boar/Stud	_____				

☐ Other Type of Livestock on the farm: _____ No. of Animals: _____

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2.3 Acreage cleared and available for application (excluding all required buffers and areas not covered by the application system): _____ Required Acreage (as listed in the CAWMP): _____

2.4 Number of lagoons: _____ Total Capacity (cubic feet): _____ Required Capacity (cubic feet): _____

Number of Storage Ponds: _____ Total Capacity (cubic feet): _____ Required Capacity (cubic feet): _____

2.5 Are subsurface drains present within 100' of any of the application fields? **YES** or **NO** (circle one)

2.6 Are subsurface drains present in the vicinity or under the waste management system? **YES** or **NO** (circle one)

2.7 Does this facility meet all applicable siting requirements? **YES** or **NO** (circle one)

2.8 Brief description of treatment process: _____

3. REQUIRED ITEMS CHECKLIST:

Please indicate that you have included the following required items by signing your initials in the space provided next to each item.

	Applicants Initials
3.1 One completed and signed original and two copies of the application for NPDES Individual Permit - Animal Waste Operations;	_____
3.2 Three copies of a general location map indicating the location of the animal waste facilities and field locations where animal waste is land applied and a county road map with the location of the facility indicated;	_____
3.3 Three copies of the entire Certified Animal Waste Management Plan (CAWMP). If the facility does not have a CAWMP, it must be completed prior to submittal of a permit application for animal waste operations.	_____

The CAWMP **must** include the following components. *Some of these components may not have been required at the time the facility was certified but should be added to the CAWMP for permitting purposes*:

3.3.1 The Waste Utilization Plan (WUP) must include the amount of Plant Available Nitrogen (PAN) produced and utilized by the facility
3.3.2 The method by which waste is applied to the disposal fields (e.g. irrigation, injection, etc.)
3.3.3 A map of every field used for land application
3.3.4 The soil series present on every land application field
3.3.5 The crops grown on every land application field
3.3.6 The Realistic Yield Expectation (RYE) for every crop shown in the WUP
3.3.7 The PAN applied to every land application field
3.3.8 The waste application windows for every crop utilized in the WUP
3.3.9 The required NRCS Standard specifications
3.3.10 A site schematic
3.3.11 Emergency Action Plan
3.3.12 Insect Control Checklist with chosen best management practices noted
3.3.13 Odor Control Checklist with chosen best management practices noted
3.3.14 Mortality Control Checklist with the selected method noted
3.3.15 Lagoon/storage pond capacity documentation (design, calculations, etc.); please be sure to include any site evaluations, wetland determinations, or hazard classifications that may be applicable to your facility
3.3.16 Operation and Maintenance Plan

If your CAWMP includes any components not shown on this list, please include the additional components with your submittal. (Composting, waste transfers, etc.)

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4. APPLICANT'S CERTIFICATION:

I, _____ (Land Owner's name listed in question 1.2), attest that

this application for _____(Facility name listed in question 1.1) has been reviewed by me and is accurate and complete to the best of my knowledge. I understand that if all required parts of this application are not completed and that if all required supporting information and attachments are not included, this application package will be returned to me as incomplete.

Signature _____ Date _____

5. MANAGER'S CERTIFICATION: (complete only if different from the Land Owner)

I, _____ (Manager's name listed in question 1.6), attest that this

application for _____ _____(Facility name listed in question 1.1) has been reviewed by me and is accurate and complete to the best of my knowledge. I understand that if all required parts of this application are not completed and that if all required supporting information and attachments are not included, this application package will be returned as incomplete.

Signature _____ Date _____

THE COMPLETED APPLICATION PACKAGE, INCLUDING ALL SUPPORTING INFORMATION AND MATERIALS, SHOULD BE SENT TO THE FOLLOWING ADDRESS:

NORTH CAROLINA DIVISION OF WATER RESOURCES
WATER QUALITY REGIONAL OPERATIONS SECTION
ANIMAL FEEDING OPERATIONS PROGRAM
1636 MAIL SERVICE CENTER
RALEIGH, NORTH CAROLINA 27699-1636
TELEPHONE NUMBER: (919) 807-6464
FAX NUMBER: (919) 807-6496

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6. SURFACE WATER CLASSIFICATION:

This form must be completed by the appropriate DWR regional office and included as a part of the project submittal information.

INSTRUCTIONS TO NC PROFESSIONALS:

The classification of the downslope surface waters (the surface waters that any overflow from the facility would flow toward) in which this animal waste management system will be operated must be determined by the appropriate DWR regional office. Therefore, you are required, **prior to submittal of the application package,** to submit this form, with items 1 through 6 completed, to the appropriate Division of Water Resources, Water Quality Regional Operations Supervisor (see page 6 of 10). At a minimum, you must include an 8.5" by 11" copy of the portion of a 7.5 minute USGS Topographic Map which shows the location of this animal waste application system and the downslope surface waters in which they will be located. Identify the closest downslope surface waters on the attached map copy. **Once the regional office has completed the classification, reincorporate this completed page and the topographic map into the complete application form and submit the application package.**

6.1 Farm Name: _____

6.2 Name & complete address of engineering firm: _____

Telephone number: (_____) _____ - _____

6.3 Name of closest downslope surface waters: _____

6.4 County(ies) where the animal waste management system and surface waters are located_____

6.5 Map name and date: _____

6.6 NC Professional's Seal (If appropriate), Signature, and Date:

TO: REGIONAL AQUIFER PROTECTION SUPERVISOR

Please provide me with the classification of the watershed where this animal waste management facility will be or has been constructed or field located, as identified on the attached map segment(s):

Name of surface waters:_____

Classification (as established by the Environmental Management Commission):_____

Proposed classification, if applicable: _____

Signature of regional office personnel: _____ Date:_____

(All attachments must be signed)

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DIVISION OF WATER RESOURCES REGIONAL OFFICES (9/05)

Asheville Regional WQROS Supervisor
2090 U.S. Highway 70
Swannanoa, NC 28778
(828) 296-4500
Fax (828) 299-7043

Avery	Macon
Buncombe	Madison
Burke	McDowell
Caldwell	Mitchell
Cherokee	Polk
Clay	Rutherford
Graham	Swain
Haywood	Transylvania
Henderson	Yancey
Jackson	

Washington Regional WQROS Supervisor
943 Washington Square Mall
Washington, NC 27889
(252) 946-6481
Fax (252) 975-3716

Beaufort	Jones
Bertie	Lenoir
Camden	Martin
Chowan	Pamlico
Craven	Pasquotank
Currituck	Perquimans
Dare	Pitt
Gates	Tyrell
Greene	Washington
Hertford	Wayne
Hyde	

Raleigh Regional WQROS Supervisor
1628 Mail Service Center
Raleigh, NC 27699-1628
(919) 791-4200
Fax (919) 571-4718

Chatham	Nash
Durham	Northampton
Edgecombe	Orange
Franklin	Person
Granville	Vance
Halifax	Wake
Johnston	Warren
Lee	Wilson

Fayetteville Regional WQROS Supervisor
225 Green Street, Suite 714
Fayetteville, NC 28301-5094
(910) 486-1541
Fax (910) 486-0707

Anson	Moore
Bladen	Richmond
Cumberland	Robeson
Harnett	Sampson
Hoke	Scotland
Montgomery	

Mooresville Regional WQROS Supervisor
610 East Center Avenue
Mooresville, NC 28115
(704) 663-1699
Fax (704) 663-6040

Alexander	Lincoln
Cabarrus	Mecklenburg
Catawba	Rowan
Cleveland	Stanly
Gaston	Union
Iredell	

Wilmington Region WQROS Supervisor
127 Cardinal Drive Extension
Wilmington, NC 28405-3845
(910) 796-7215
Fax (910) 350-2004

Brunswick	New Hanover
Carteret	Onslow
Columbus	Pender
Duplin	

Winston-Salem Regional WQROS Supervisor
450 Hanes Mill Road, Suite 300
Winston-Salem, NC 27105
Phone (336) 776-9800
Fax (336) 776-9797

Alamance	Rockingham
Alleghany	Randolph
Ashe	Stokes
Caswell	Surry
Davidson	Watauga
Davie	Wilkes
Forsyth	Yadkin
Guilford	

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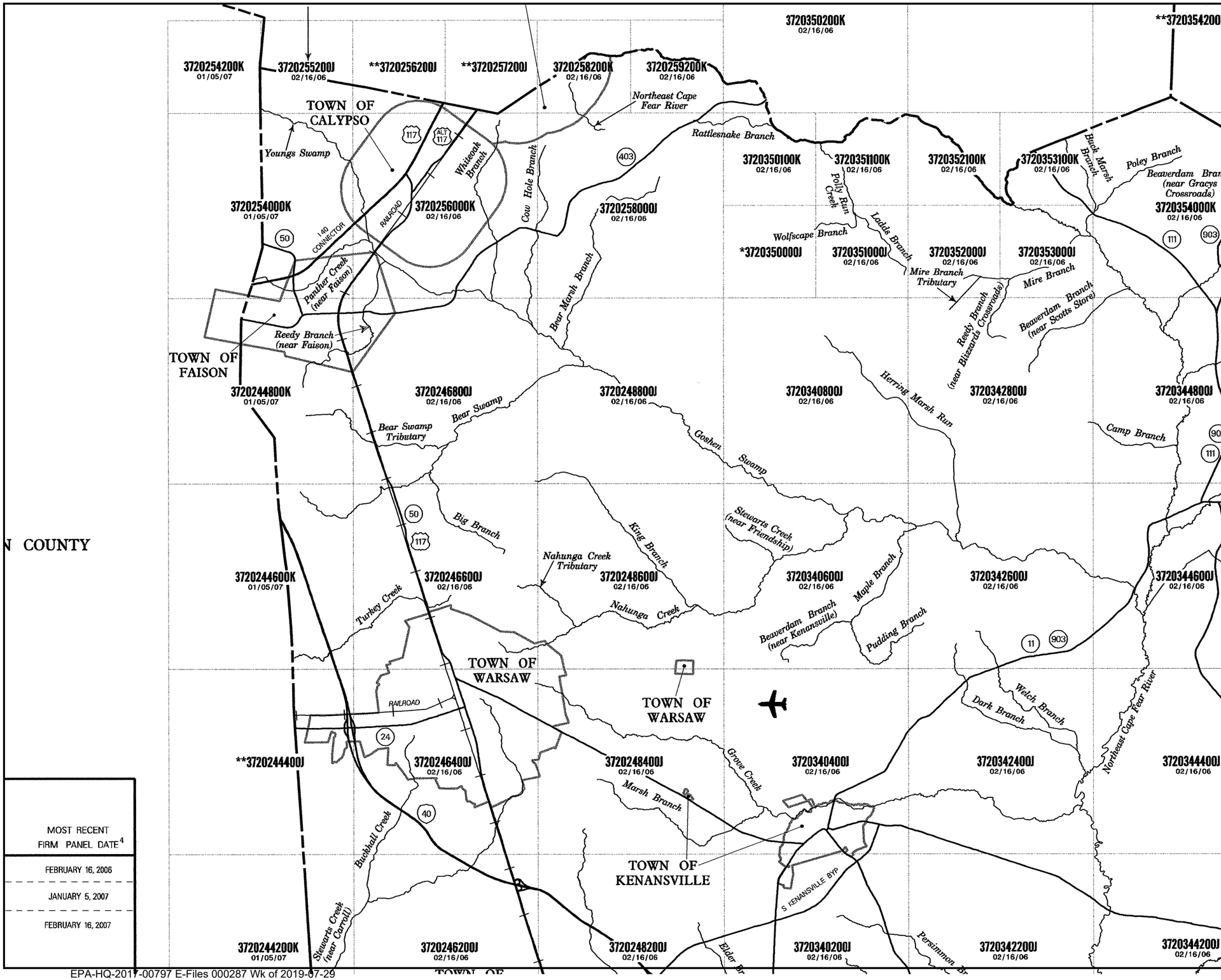

MOST RECENT FIRM PANEL DATE[4]
FEBRUARY 16, 2006
JANUARY 5, 2007
FEBRUARY 16, 2007

FIRM
FLOOD INSURANCE RATE MAP

DUPLIN COUNTY,
NORTH CAROLINA
AND INCORPORATED AREAS

(SEE LISTING OF COMMUNITIES TABLE)

MAP INDEX

PANEL PRINTED: 2344, 2346, 2348, 2365, 2366, 2368, 2375, 2385, 2386, 2387, 2388, 2395, 2396, 2397, 2440, 2442, 2446, 2448, 2460, 2462, 2464, 2466, 2468, 2480, 2482, 2484, 2486, 2488, 2540, 2542, 2552, 2560, 2580, 2582, 2592, 3305, 3306, 3307, 3308, 3315, 3316, 3317, 3325, 3326, 3328, 3335, 3344, 3346, 3348, 3364, 3366, 3368, 3386, 3388, 3400, 3402, 3404, 3406, 3408, 3420, 3422, 3424, 3426, 3428, 3440, 3442, 3444, 3446, 3448, 3460, 3462, 3464, 3466, 3468, 3480, 3482, 3484, 3501, 3502, 3510, 3511, 3520, 3521, 3530, 3531, 3540, 3560, 3561, 4400

MAP REVISED
FEBRUARY 16, 2007

MAP NUMBER
37061CINDOC

State of North Carolina
Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

15A NCAC 02D .1806 CONTROL AND PROHIBITION OF ODOROUS EMISSIONS

(a) Purpose. The purpose of this Rule is to provide for the control and prohibition of objectionable odorous emissions.

(b) Definitions. For the purpose of this Rule the following definitions shall apply:

(1) "Commercial purposes" means activities that require a state or local business license to operate.

(2) "Temporary activities or operations" means activities or operations that are less than 30 days in duration during the course of a calendar year and do not require an air quality permit.

(c) Applicability. With the exceptions in Paragraph (d) of this Rule, this Rule shall apply to all operations that may produce odorous emissions that can cause or contribute to objectionable odors beyond the facility's boundaries.

(d) Exemptions. The requirements of this Rule do not apply to:

(1) processes at kraft pulp mills identified in Rule .0528 of this Section, and covered under Rule .0524 or .0528 of this Section;

(2) processes at facilities that produce feed-grade animal proteins or feed-grade animal fats and oils identified in and covered under Rule .0539;

(3) motor vehicles and transportation facilities;

(4) all on-farm animal and agricultural operations, including dry litter operations and operations covered under Rule .1804 of this Section;

(5) municipal wastewater treatment plants and municipal wastewater handling systems;

(6) restaurants and food preparation facilities that prepare and serve food on site;

(7) single family dwellings not used for commercial purposes;

(8) materials odorized for safety purposes;

(9) painting operations that do not require a business license; or

(10) all temporary activities or operations.

(e) Control Requirements. The owner or operator of a facility subject to this Rule shall not operate the facility without implementing management practices or installing and operating odor control equipment sufficient to prevent odorous emissions from the facility from causing or contributing to objectionable odors beyond the facility's boundary.

(f) Maximum feasible controls. If the Director determines that a source or facility subject to this Rule is emitting an objectionable odor by the procedures described in Paragraph (g) of this Rule, the Director shall require the owner or operator to implement maximum feasible controls for the control of odorous emissions. (Maximum feasible controls shall be determined according to the procedures in Rule .1807 of this Section.) The owner or operator shall:

(1) within 180 days of receipt of written notification from the Director of the requirement to implement maximum feasible controls, complete the determination process outlined in 15A NCAC 2D .1807 and submit the completed maximum feasible control determination process along with a permit application for maximum feasible controls and a compliance schedule to the Division of Air Quality; the compliance schedule shall contain the following increments of progress:

(A) a date by which contracts for the odorous emission control systems and equipment shall be awarded or orders shall be issued for purchase of component parts;

(B) a date by which on-site construction or installation of the odorous emission control systems and equipment shall begin;

(C) a date by which on-site construction or installation of the odorous emission control systems and equipment shall be completed; and

(D) a date by which final compliance shall be achieved.

(2) within 18 months after receiving written notification from the Director of the requirement to implement maximum feasible controls, have installed and begun operating maximum feasible controls.

The owner or operator shall certify to the Director within five days after the deadline for each increment of progress in this Paragraph whether the required increment of progress has been met.

(g) Determination of the existence of an objectionable odor. A source or facility is causing or contributing to an objectionable odor when:

(1) A member of the Division staff determines by field investigation that an objectionable odor is present by taking into account nature, intensity, pervasiveness, duration, and source of the odor and other pertinent factors;

(2) The source or facility emits known odor causing compounds such as ammonia, total volatile organics, hydrogen sulfide, or other sulfur compounds at levels that cause objectionable odors beyond the property line of that source or facility; or

(3) The Division receives epidemiological studies associating health problems with odors from the source or facility or evidence of documented health problems associated with odors from the source or facility provided by the State Health Director.

History Note: *Authority G.S. 143-215.3(a)(1); 143-215.107(a)(5);*
Eff. April 1, 2001.

North Carolina State General Permit Renewal

Proposed Changes to the 2014 State General Permits

General Changes: Update name of Division, Director, effective dates of General Permit. Made wording changes for consistency – i.e., always refer to as "General Permit" rather than using "Permit" and "General Permit" interchangeably.

Condition II.10: Corrected the regulatory citation for State Veterinarian's authority to dictate proper mortality management.

Condition II.17: Corrected the regulatory citation for operators of Animal Waste Management System.

Condition II.24: Cleaned up language to make clear that calibration is required at least once every two years.

Condition III.4: Change soil sampling requirement from annually to once every three years. – *Requirement of General Statutes 143-215.10C(e) as modified by Session Law 2013-228 (Senate Bill 205).*

Condition III.5: Modified language to more clear that the waste sample analyzed should represent the waste as applied – i.e., if lagoon is agitated for waste application, the sample should be taken when agitated rather than prior to agitation.

Condition III.11: Eliminated phrase that created a contradiction within the existing permit.

Condition III.13: Reorganized list of events requiring notification to make consistent with 2012 NPDES General Permit and for simplification. Added new item (f) that requires notification of regional office if waste levels enter into structural freeboard zone. Added requirement for a 5-Day Plan of Action within two days. – *Current policy being added to Permit for clarification; this same change was made to the 2012 NPDES General Permit.*

Conditions III.14 and 15: Combined these two conditions to eliminate redundancy.

Conditions III.20: This condition was a placeholder in the 2009 State General Permit for the proposed monitoring rules that were under consideration. These rules are no longer under consideration. Condition III.10 allows for the Division to require any monitoring that may be needed.

Conditions V.3, Cattle Permit ONLY: This condition was changed to allow cattle operations that drop below the permitting threshold of 100 confined cattle for three years or more to request permit rescission prior to closure of waste lagoons/containment basins. – *Requirement of Session Law 2013-413(House Bill 74).*

Conditions V.4: The ten cubic yards per year limit was added to clarify the intent of the four cubic yards per visit rule.

Definitions – Agronomic Rates: Updated citation to current NRCS NC Conservation Practice Standards.

09/26/2013

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09/26/2013

LEGALNOTICE.ORG Information without boundaries

Home

Thursday, December 18, 2014

The News & Observer

Notice Type: Legal Notices
Posting Date : 10/28/2013 Expiration Date : 11/11/2013

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NOTICE OF PUBLIC MEETING TO BE HELD BY THE NORTH CAROLINA ENVIRONMENTAL MANAGEMENT COMMISSION ON INTENT TO ISSUE STATE GENERAL PERMITS FOR ANIMAL OPERATIONS SUBJECT: Public meetings have been scheduled concerning the issuance of animal waste State General Permits for the following types of animal operations: AWG100000 - Swine Operations AWG200000 - Cattle & Dairy Operations AWG300000 - Poultry Operations PURPOSE: The North Carolina Environmental Management Commission proposes to issue General Permits for animal waste operations subject to specific limitations and special conditions. The Division of Water Resources pursuant to NCGS 143-215.4(b)(1) and (2) and15A NCAC 02T .0111 has determined that it is in the public interest to hold meetings to receive pertinent public comments. Information received by December 6, 2013 will be taken into consideration in finalizing the permitting decisions. MEETINGS: The meetings will be conducted in the following manner: Following an explanation of the proposed permit conditions, public comments, statements, data and other information may be submitted in writing or presented orally at the meeting. Comment should specifically address issues directly related to the proposed permits. Persons desiring to speak should sign up during registration. Presentations longer than three minutes must be accompanied by three (3) written copies to be filed with the meeting clerk during registration. Cross examination of speakers will not be allowed; however, the meeting officers may ask questions for clarification. The meeting record will close at 5:00 pm on December 6, 2013. WHEN: November 12 and 14, 2013 at 7:00 pm. Registration begins at 6:30 pm. WHERE: November 12, 2013 Iredell County Center 444 Bristol Drive, Statesville, NC November 14, 2013 James Sprunt Community College - Monk Auditorium 133 James Sprunt Drive, Kenansville, NC INFORMATION: Copies of the draft permits and fact sheets are available at http://portal.ncdenr.org/web/wq/aps/afo or by contacting: Christine B. Lawson NC Division of Water Resources 1636 Mail Service Center Raleigh, NC 27699-1636 Phone: 919.807.6354 Written comments will be accepted at the above address. N&O: October 28, 2013

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STATE OF NORTH CAROLINA
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

REPORT OF PROCEEDINGS ON THE PROPOSED RENEWAL OF THE STATE GENERAL PERMITS FOR ANIMAL FEEDING OPERATIONS

PUBLIC MEETING
NOVEMBER 12, 2013
STATESVILLE, NORTH CAROLINA

PUBLIC MEETING
NOVEMBER 14, 2013
KENANSVILLE, NORTH CAROLINA

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ATTACHMENTS

Attachment 1 – Existing State General Permits
Attachment 2 – Draft Proposed State General Permits
Attachment 3 – Brief of Proposed Changes in Draft General Permits
Attachment 4 – Public Hearings Press Release and Fact Sheet
Attachment 5 – Transcript of Oral Comments from Public Hearings
Attachment 6 – Written Comments
Attachment 7 – Revised State General Permits

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I. BACKGROUND

North Carolina's existing State Animal Waste Management System General Permits are due to expire on September 30, 2014. Copies of these existing permits are contained in Attachment 1. Accordingly, the Division of Water Resources (Division) has drafted new, proposed State General Permits to replace the current permits. These draft permits will cover animal feeding operations according to the requirements of G.S. 143-215.10C and 15A NCAC 02T .1300.

The animal waste management systems to be covered by these draft permits include the collection, transfer, treatment, storage, and application of animal waste. Animal waste is collected using a variety of methods including flush systems, pit recharge systems, barn scraper systems and scraped surface lots. The waste is transmission via channels or pipes to anaerobic lagoons or storage ponds to treat and store the waste. Irrigation equipment or waste spreaders are used for application of the animal waste at agronomic rates. Animal waste is usually applied using permanent or mobile pumps and piping to traveling gun and reel systems but could also use a solid-set irrigation system, transportation and application vehicle system such as a honey wagon, and other forms of application systems for the animal waste.

North Carolina's Animal Waste Management System General Permits provide a permit option for facilities not covered by the federal NPDES permit and that have at least 100 confined cattle, 250 swine, or 30,000 poultry with a liquid waste management system. Facilities not covered by the federal NPDES permit and have less that 100 confined cattle, 250 swine, or 30,000 poultry with a liquid waste management system are deemed permitted under 15A NCAC 02T .1303 unless it experiences significant problems with its waste management system. In that case, the Division Director may require the facility to apply for coverage under a general permit or an individual permit.

In accordance with applicable requirements, the Division has proposed to renew the existing general permits with draft, revised Animal Waste System Non-discharge General Permits. The proposed permits have been revised for the following operations:

- General Permit No. AWS100000 – Swine Operations
- General Permit No. AWS200000 – Cattle Operations
- General Permit No. AWS300000 – Poultry Operations with Liquid Waste

These draft permits were sent to public notice on October 28, 2013. The public comment period closed on Friday, December 6, 2013. The proposed permits are scheduled for issuance on October 1, 2014. Copies of these draft permits are contained in Attachment 2.

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II. PROPOSED CHANGES IN THE REVISED PERMITS

The proposed draft general permits that were sent to public notice contained many of the same requirements included in the existing permits. The majority of the changes from the current permit are structural and grammatical in nature, to organize the conditions and remove some redundant language. Some changes were made to better protect the State's water resources in accordance with applicable Statute and Administrative Code. The list of new or modified conditions is as follows:

- Corrected the regulatory citation for State Veterinarian's authority to dictate proper mortality management.
- Corrected the regulatory citation for operators of Animal Waste Management Systems.
- Cleaned up language to make clear that calibration is required at least once every two years.
- Soil sampling is required at least once every three years on all fields upon which animal waste is applied.
- Waste sample submitted for analysis should represent the waste as applied – i.e., if lagoon is agitated for waste application, the sample should be taken when agitated rather than prior to agitation.
- Regional office notification is required if waste levels rise to the structural freeboard zone. A 5-Day Plan of Action must be submitted within two days that outlines steps to lower waste levels below the structural freeboard.
- Cattle operations that drop below the permitting threshold of 100 confined cattle for three years or more to request permit rescission prior to closure of waste lagoons/containment basins.
- Limits the distribution of animal waste for personal use to ten cubic yards per year.
- Updated citation to current NRCS NC Conservation Practice Standards.

A copy of a short handout briefly describing the proposed changes to the general permits, which was provided by Division staff at the public meetings, is contained in Attachment 3.

III. THE PUBLIC HEARINGS

Pursuant to NCGS 143-215.4(b)(1) and (2) and 15A NCAC 02T .0108, the Director of the Division of Water Resources determined that it would be in the public interest to conduct public hearings to receive all pertinent public comment on whether to issue, not issue, or modify the proposed general permits. Jon Risgaard, the Division's Non-Discharge Permitting Unit Supervisor, and Evan Kane, the Division's Groundwater Planning and Environmental Review Branch Chief, served as hearing officers. The hearings were conducted on November 12 and 14 in Statesville and Kenansville, respectively. A Fact Sheet and Press Release, which notified the public of the hearings and provided an overview of the revised general permits, are contained in Attachment 4. Approximately forty-six people attended these meetings and, of these, five individuals chose to present oral comments regarding the draft general permits.

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IV. THE ORAL COMMENTS

Five individuals chose to make oral comments at the public hearings. A summary of the oral comments are provided in this document along with the corresponding responses to each comment. Division Staff prepared responses for each comment and used feedback from the Hearing Officers to ensure that permit relevant public concerns were addressed. Written transcripts of all the comments received at the two meetings are contained in Attachment 5.

Comment 1: I do not feel that the calibration requirement should be included in this permit for two reasons. First, to apply waste at agronomic applications; you must recalibrate every field you apply to because every field has a different requirement. Also, every waste analysis changes, so you must recalibrate to meet the requirement of the waste to apply the waste at the proper agronomic rate. It is redundant to recalibrate every two years and have it in the file because it's a useless calibration.
Secondly, the municipal applicators which hold surface irrigation system permits and land application permits for residual solids are not required to have that every two year calibration. Requirements for the various operators should be consistent.

Response: Calibration of waste application equipment is essential to ensure that waste is being applied uniformly and at the rate intended. Animal waste is applied using various types of equipment that may or may not be adjusted at each application. Field Calibration Procedures for Animal Wastewater Application Equipment can be found on the following NC State website:
http://www.bae.ncsu.edu/topic/go_irrigation/wastewater.php

Calibration requirements are consistent with the calibration requirements for other permitted wastewater facilities. Municipal and Industrial Wastewater applicators are required to calibrate irrigation and waste disposal equipment at least once every permit cycle as a permit condition. Land application of residuals permittees must include equipment calibration and maintenance schedules in their Operation & Maintenance Plan, which is incorporated into their Permits.

Comment 2: We would oppose any additional changes to the permits that would make the permits more stringent. We would also oppose any additional changes that would make compliance with the permits more costly or burdensome to farmers.

Response: The changes made in the Permits submitted for review are necessary for protection of water quality. The only changes made in finalizing the Draft General Permits were in Conditions III.15-17, see Comment 13.22. These changes to the Permit language do not make the Permits more stringent, costly, or burdensome.

Comment 3: We request that the Division ensure through appropriate means that cattle and dairy farmer seeking permit rescission without waste structure closure be fully informed. It is particularly important that farmers understand that once the permit is

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rescinded, the farm will not be able to go above the threshold of 100 cattle in confinement without having to install substantial upgrades at their facilities. It is important that farmers are aware of all of the ramifications of their permits being rescinded before taking this step.

Response: Division staff will educate permittees of all the potential consequences of permit rescission prior to issuance.

Comment 4: In Section I.8, setbacks for application, 100 feet from any well - that is an inadequate protective setback and want much further setbacks from property boundaries and occupied dwellings as well. Our concern is in fact that these wastes could be mobile in groundwater. Given some of the evidence of contamination that has shown up in voluntary monitoring program that some of these operations applied, I think there is reason for concern and need to make those setbacks greater.

Response: Setbacks for the construction of water supply wells are established in Administrative Code. 15A NCAC 02C .0107(a)(2) Standards of Construction: Water Supply Wells requires a minimum 100 foot separation for industrial or municipal residuals disposal, wastewater-irrigation sites, animal feedlots, or manure piles. Additional setback requirements for other non-discharge disposal facilities are established in 15A NCAC 02T .0706 and 15A NCAC 02T .1006. These rules require a 100 foot setback of wastewater irrigation sites and residuals disposal, respectively, from a well. The Ninth Senate Bill 1217 Interagency Group Guidance Document, Appendix 8.1 states that the required minimum distance from the outer perimeter of the waste application area to a well is 100 feet. Based upon current regulations sited above, changes to setbacks from wells should be addressed through the rule-making process and not the Permit renewal process.

Comment 5: In section II.19, there should be no waste application in wind conditions "reasonably expected to cause mist to reach surface waters, wetlands, or cross property or field boundaries". This seems to us to be a pretty unenforceable provision, and we think this needs to be more specifically implemented in order to make a more credible permit and actually require documentation of conditions under which applications occur.

Response: Condition II.19: NC NRCS Conservation Practice Standard No. 590 – Nutrient Management, the state technical standard for animal waste application, directs operators to not apply wastes when there is a high probability that the wind will blow the material offsite. A more thorough analysis would be needed before more specific performance criteria could be implemented.

Comment 6: Section III.5 calls for an analysis of representative sample of waste that to be applied within 60 days before or after the application. If you are recalibrating for not only the field you are applying to and its conditions but also for the constituents in the waste to be applied, it seems very strange to allow this analysis to be done 60 days after the application occurs.

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Response: Condition III.5: The Permit condition states "as close to the time of application as practical and at least within sixty (60) days…" The time requirement for waste analysis is specified in G.S. 143-215.10C(e)(6) and cannot be changed by this process.

Comment 7: Section III.9 says that any discharge to surface waters or wetlands requires sampling of the waste 72 hours, up to 72 hours after the discharge is first observed and a monitoring report to the Division within 30 days. But, more appropriately it requires 24 hour notice to the regional office that this discharge has occurred. Why would you only require sampling up to 72 hours after a discharge event?

Response: The Permits require notification of the Division within 24 hours of first knowledge of a discharge. The waste sample taken by the permittee within 72 hours is required to characterize the source of the release. The Division may sample as appropriate to determine the nature of a release and the extent of the impact on the land and receiving water bodies.

Comment 8: Then in Section V.12, I know that there was some legislation this year referring to changing compliance boundaries in some cases. I am hoping that the citation to the rule in the Permit means that this one of the cases where the compliance boundaries have not been shifted to the property boundary. It would seem particularly inappropriate on a large farm where you are only dealing with a lagoon or sprayfield operation that's likely to be a part of that farm. In any case, without any monitoring requirements, how is compliance to be assured that there are no violations up to the compliance boundary?

Response: Section 46 of Session Law 2013-413 amended G.S. 143-215.1(i) to include Compliance Boundary language that is specific to individual permits, and therefore not applicable to facilities covered under the proposed general permits. In addition, the statute is clear that nothing in the subsection shall be interpreted to require a revision to an existing compliance boundary previously approved by rule or permit. Groundwater monitoring is not required for these permitted facilities unless there is evidence of offsite groundwater impacts.

Comment 9: We have a lot encroachment from residential. That encroachment takes property from us every time they drill a well or build a house. The current permit says we are required to stay back 100 foot from any well. However, the county allows you to drill a well within 10 foot of property line. That means we lose 90 feet. Under our waste management plan, it says we are to stay 200 foot from a residence which falls under this permit guidance we have to follow animal waste permit/cattle waste management plan. That plan says 200 foot so we must maintain that distance. So we lose 190 feet when they build a house 10 foot from the property line, and we get no compensation for that property we lose.

Response: 15A NCAC 02C .0107(a)(2) Standards of Construction: Water Supply Wells requires a minimum horizontal separation between a well and the following potential sources of groundwater contamination at the time of well construction: 100 feet for

industrial or municipal residuals disposal or wastewater-irrigation sites; and 100 feet for animal feedlots or manure piles. New water supply well construction must consider existing potential sources before well construction is allowed.

Setback requirements for animal waste application fields are established at the time the field is put into use. New homes being constructed adjacent to established, documented waste application fields would not require modifications to existing buffers for those fields.

V. THE WRITTEN COMMENTS

The comment period for these draft general permits remained open until December 6, 2013. During this period, a total of six written comments regarding the proposed permits were received. A summary of the written comments are provided in this document along with the corresponding responses to each comment. Division Staff prepared responses for each comment and used feedback from the Hearing Officers to ensure that permit relevant public concerns were addressed. All the written comments that were received are contained in Attachment 6.

Comment 10: Norman Jordan, on behalf of the North Carolina Dairy Producers Association, expressed concern that there are no additional changes made that would make it more difficult or expensive for dairy farmers to comply with the permits.

Response: This issue was addressed in the response to Oral Comment 2.

Comment 11: Anne Coan, on behalf of the North Carolina Farm Bureau Federation, submitted the following comments:

1. NC Farm Bureau opposes any additional changes to the permits that would make the permits more stringent or that would make compliance with the permits more costly or burdensome to the farmers.
2. It is important that cattle and dairy farmers understand that once a permit it rescinded they would not be allowed to go above the permitting threshold of 100 confined cattle without installing facility upgrades.

Response:

1. *Additional Modification: This issue is addressed in the response to Oral Comment 2.*
2. *Rescission notification: This issue is addressed in the response to Oral Comment 3.*

Comment 12: Keith Larick, on behalf of the North Carolina Department of Agriculture and Consumer Services, would oppose any additional changes to the permits that would increase the regulatory requirements.

Response: This issue was addressed in the response to Oral Comment 2.

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Comment 13: Jocelyn D'Ambrosia of Earthjustice, Gray Jernigan of Waterkeeper Alliance, and Chandra Taylor of Southern Environmental Law Center, on behalf of the Catawba Riverkeeper Foundation, Cape Fear River Watch, Neuse Riverkeeper Foundation, North Carolina Environmental Justice Network, Pamlico-Tar River Foundation, Waterkeepers Carolina, Western North Carolina Alliance, Winyah Rivers Foundation, and Yadkin Riverkeeper, Inc., submitted the following comments:

1. The general permits do not meet the non-discharge requirements; facilities under the permits are discharging significant nutrient and bacteria loads to watersheds across North Carolina. DENR must use the renewal period as an opportunity to assess whether facilities are complying with the permits and come up with alternative measures to control pollution from these facilities.

Response: General Permits are for non-discharge animal waste management systems in accordance with G.S. §143-215. Condition I.1 requires systems covered by these General Permits be effectively maintained and operated as non-discharge systems. The Division conducts inspections of all permitted animal operations annually to determine if the system is in compliance with its animal waste management plan and Permit as required by G.S. §143-215.10F. The Division may also conduct sampling as needed to determine if there are any violations of water quality standards, per Condition IV.1.d.

In response to the 2008 Petition for Rule-Making regarding monitoring at animal operations, the Division initiated a monitoring study conducted by the United States Geological Survey (USGS). The USGS collected samples in fifty-four watersheds to identify detectible contributions of pollutants from animal operations. The full report on the study including analysis and results is expected to be finalized and release later in 2014.

2. General permits should be modified to come into compliance with Title VI of the Civil Rights Act of 1964 in addressing the following.
    a. Swine facilities are disproportionately concentrated in communities of color. African American communities disproportionately bear the impact of swine facilities.
    b. Lagoon sprayfield systems can pollute nearby waters through lagoon breaches and spills, lagoon leakage into shallow groundwater, sprayfield runoff from over-applied waste or waste applied on saturated or frozen ground, waste directly applied into ditches, and waste blown into surface waters or neighboring homes during waste application.
    c. Air pollution from swine facilities adversely affects neighboring communities and can spread antibiotic-resistant bacteria, threatening human health. DENR should consider requiring facilities to install controls on confinement houses that filter the air.
    d. Proximity to swine facilities depresses property values.

Response:
2.a. – The General Permits cover existing swine facilities and existing operations that were previously permitted by the Division and are not portable; therefore, the renewal of

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these General Permits does not cause additional impacts to communities. Since 1995, all new swine operations have been subject to the Swine Farm Siting Act (G.S. §106-800) which establishes limitations on the siting of swine houses for permitted swine operations. In 2007, G.S. §143-215.10I made permanent the moratorium on the construction of new swine operations or the expansion of existing swine operations that employ a lagoon-sprayfield system as the primary method of waste treatment and disposal. Any new or expanding facilities permitted after that time must satisfy the Performance Standards for New/Expanding Swine Operation (G.S. §143-215.10I and 15A NCAC 02T .1307-1309 and 15A NCAC 02D .1808).

2.b. – There are statutes, rules, and permit conditions that address each of the concerns that were raised. Examples include the following:

- *Lagoon breaches and spills are prohibited under the General Permits. Permit Conditions I.1, II.1, II11-15, II.25, II.27, III.1-3, III.18, IV.1, and V.2 all directly address issues to prevent lagoon breaches and spills.*
- *Permitted lagoons are required to meet the current NC NRCS Conservation Practice Standard No. 359 – Waste Treatment Lagoon at the time of construction. Earthen structures for new/expanding swine operations must be designed and constructed with synthetic liners to eliminate seepage, 15A NCAC 02T .1307(1)(A).*
- *Permit Condition II.5 prohibits waste application at rates resulting in excessive ponding or any runoff.*
- *Condition II.21 prohibits the application of waste on saturated or frozen ground.*
- *The General Permits do not allow for discharges to ditches. Condition II.1 prohibits waste being directly applied to ditches.*
- *Condition II.19 prohibits waste from being applied such that it reaches surface waters or wetlands or crosses property lines or field boundaries.*

The Division conducts inspections of all permitted animal operations annually to determine if the system is in compliance with its animal waste management plan and Permit as required by G.S. §143-215.10F. The Division may also conduct sampling to determine if there are any violations of water quality standards.

2.c. – Permittees are required by G.S. §143-215.10C(e)(1) to develop and follow and Odor Control Checklist to reduce off-site odor impacts as a part of the CAWMP. Odor complaints related to animal operations are forwarded to and assessed by the Division of Air Quality. Site specific measures may be required based upon the findings of the Division of Air Quality. Some swine operations are voluntarily making modifications that improve air quality such as installing lagoon covers for methane capture and energy generation.

2.d. – The General Permits cover existing swine facilities. Since 1995, all new swine operations have been subject to the Swine Farm Siting Act (G.S. §106-800) which establishes limitations on the siting of swine houses for permitted swine operations including setbacks to occupied residences, schools, hospitals, churches, outdoor recreational facilities, national parks, State Parks, historic properties acquired by the state, child care centers, property boundaries, and wells.

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3. Condition I.1 – This condition does not protect against discharges. The 25-year/24-hour storm design standard is not as protective against discharge as it may have been in the past. The last paragraph of this condition appears to allow waste discharges to or from ditches. DENR should prohibit any discharge of waste from or application of waste to a ditch that drains to surface waters or wetlands.

Response: G.S. §143-215.10C(b) states that animal waste management systems shall be designed, constructed, and operated so that the system does not cause pollution in waters of the State except as may result due to a storm event more severe than the 25-year, 24-hour storm. The structures were required to be designed based upon the NRCS Standard in place at the time of construction. There is no requirement to modify structure design.

The Condition does not allow for the discharge or application of waste to ditches and further prohibits the discharge to surface waters or wetlands. The exception described in the last paragraph requires that discharges from the ditch be controlled by approved best management practices (BMPs); this refers to the hydrologic flow leaving the ditch, not a release of pollutants. However, should any waste reach the ditch, it is required to be removed immediately, and must be reported as a discharge to a ditch.

4. Condition I.3 – DENR should require assessments of the effectiveness of the Certified Animal Waste Management Plan (CAWMP) to be submitted quarterly or with the annual certification. These assessments should be made public. DENR should require permittees to submit all amendments to the CAWMP to the Division for approval.

Response: The records associated with assessment of the CAWMP's effectiveness are maintained as part of the facility's records and are reviewed by the Division during annual compliance inspections. These records include but are not limited to lagoon level records, irrigation records, rainfall records, soil sample analysis, waste analysis, and crop yield records. Records are maintained by the Permittee for a minimum of three years, per Condition III.11, and must be submitted to the Division upon request.

5. Condition I.5 – The Division should require all facilities in all watersheds to submit facility wide evaluations for phosphorous loss at least every three years. General permits should prohibit all facilities from applying waste on fields at rates that exceed the established crop removal rate for phosphorous, not just those with "HIGH" phosphorous-loss assessment rating.

Response: 15A NCAC 02T. 1304 specifically exempts State Permitted facilities from phosphorus requirements. However, facilities in watersheds that are sensitive to nutrient enrichment can be required to conduct phosphorus evaluations through 15A NCAC 02B.

G.S. §143-215.10C(e)(6) establishes that nitrogen shall be a rate limiting element and that phosphorous application comply with the nutrient management standard. NC manure nutrient application criteria as related to phosphorous-loss assessments are established by NC NRCS Conservation Practice Standard No. 590 – Nutrient Management which is the state technical standard for nutrient management.

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6. Condition I.6 – DENR should define the term "treatment units," and clarify that permittees may not circumvent the state law barring 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.

Response: The addition of definitions involves rule changes and is not within the scope of this permit renewal process. The addition of treatment units refers to supplemental treatment processes in conjunction with the current treatment system, i.e. a solids separation unit. The Condition specifically requires Division approval for use. Condition I.4 specifically prohibits any expansion without meeting the requirements of the Performance Standards for New/Expanding Swine Operation (G.S. §143-215.10.I).

7. Condition I.7 – The permit should define the term "innovative treatment process" and clarify that permittees may not circumvent the state law barring 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.

Response: The addition of definitions involves rule changes and is not within the scope of this permit renewal process.

Condition I.4 specifically prohibits any expansion without meeting the requirements of the Performance Standards for New/Expanding Swine Operation (G.S. §143-215.10.I). The pilot testing of an innovative treatment process does not supersede this requirement.

8. Condition I.8 – The permit should increase the setback for private wells to at least 500 feet, impose setback for public or community wells of at least 1,000 feet, and impose setback to protect waters that have high recreational use as well as designated high quality waters.

Response: This issue is addressed in the response to Oral Comment 4.

9. Condition II.7 – This condition should be amended to require manure and sludge to be incorporated into the soil within twelve hours of application to bare soils.

Response: The Division feels that the requirement for sludge applied to bare fields be incorporated before the next rain event, in addition to the current two-day maximum is appropriate. The two-day maximum is consistent with the Ninth Senate Bill 1217 Interagency Group Guidance Document, Sept. 2009.

10. Condition II.10 – DENR should ensure that the North Carolina Department of Agriculture and Consumer Services (NCDA&CS) Veterinary Division's statutes and regulations protect the environment and promulgate additional regulations if needed. The permit should define "normal mortality rates" for each facility and require reporting of all die-offs in excess of those rates within 24 hours. Permittees should consult with the Division about appropriate burial locations

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along with the dates and number of animals buried by species and type. The Division should also require groundwater monitoring for each burial site.

Response: It is outside of the purview of the Division to revise or promulgate new regulations that are under the authority of the NCDA&CS Veterinary Division granted by General Statutes Chapter 106, Article 34.

G.S. §143-215.10C(e)(3) requires Permittees to develop a mortality management plan as a part of their CAWMP. Permittees are further required to maintain stocking (and mortality) records. Division Staff does not recommend a 24-hour reporting requirement.

This Condition does require that burial be done in consultation NCDA&CS Veterinary Division, that the location be mapped, and that map provided to the Division along with records of dates and numbers of animals buried by species and type. The Condition also provides for groundwater monitoring as determined by the Division.

11. Condition II.12 – Permit should specify that the protective vegetative cover must be designed to prevent the berms and embankments from eroding.

Response: The purpose of a protective cover is the prevention of erosion. The maintenance of this protective cover and the condition of embankments, berms, pipe runs, and diversions are a part of the annual inspection that the Division conducts as required by G.S. §143-215.10F. Staff does not recommend any changes to the Permit language.

12. Condition II.17 – The permit should not incorporate an open-ended affirmative defense to potentially dangerous discharges. The permit should define circumstances that are considered "beyond the Permittee's control" to not include preventable accidents or operator error.

Response: The Division feels that the affirmative defense provision is appropriate. There are very few situations where an operator would be unable to perform the 120-minute inspection, and claim this provision. The Division does have the authority to refute the affirmative defense assertion if necessary.

13. Condition II.22 – This condition should be strengthened to require land application cease at least twenty-four hours before National Weather Service predicts, with 80% certainty, that there will be two inches or more of rainfall in the county in which the facility is located. Permit should also prohibit land application for at least twenty-four hours after rainfall of two inches or more. Recommends a twenty-four hour cessation period prior to a tropical storm or hurricane; the current four hour cessation period does not give waste time to incorporate into soil.

Response: The Condition requires Permittee to consider pending weather conditions when making decisions regarding land application of waste and to record the weather conditions. Forecasts of rainfall of two inches or more as well as the timing would need

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to be considered. The Division does not recommend language changes regarding cessation of waste application prior to storm events.

In actual practice, field conditions in the twenty-four hours following a two inch rainfall event typically prohibit the application of waste; the ground is often too wet for equipment to cross the field. Additionally, Condition II.21 prohibits application of waste on flooded or saturated land, and Condition II.5 prohibits application that results in excessive ponding or runoff. Based upon these permit conditions, the Division does not recommend any language changes regarding a twenty-four hour prohibition of application of waste following a rainfall of two inches or more.

The Condition requires application of waste cease within four hours of the National Weather Service (NWS) issuance of Hurricane/Tropical Storm Warnings or Flood Watch associated with a Hurricane/Tropical Storm. The NWS issues these watches and warnings twenty-four hours prior to the storm event. The four hour window after issuance of said watches/warnings provides operators time to receive notification and cease waste application. This also allows at least twenty hours for the waste to incorporate into the soil.

14. Condition II.24 – Calibration should be required at least once every six months and results of testing submitted to Division.

Response: The Division feels that the current calibration frequency is appropriate. This issue is further addressed in the response to Oral Comment 1.

15. Condition II.26 – Permit should prohibit the storage of crops in bales around the exterior of sprayfields/crop fields.

Response: The storage of hay bales on field edges is a common agricultural practice not exclusive to waste application fields. The inspection process also addresses any situation when bales are not being utilized or removed. Division Staff does not recommend any language change.

16. Condition II.27 – Permit should require the Division approval prior to lowering lagoon levels below designed stop pump levels and should clarify that this does not override Condition II.22.

Response: Division notification is not necessary. Provisions for temporary lowering of lagoon levels below stop pump levels are in the NC NRCS Conservation Practice Standard No. 359 – Waste Treatment Lagoon, the state technical standard.

17. Condition III.1 – DENR should provide Permittees guidance on how to inspect lagoons, require broader installation and use of monitoring wells or an evaporation pan to determine lagoon seepage loss, or require third party testing for lagoon seepage.

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Response: Permittees are required to do a visual inspection to look for signs of erosion, leakage, damage or discharges as a part of their monthly inspection. Division staff also inspects the embankments during the annual inspection process. The inspector informs the Permittee of any areas of concern and recommends corrective actions. Technical assistance from NRCS or private consultants is available to advise Permittees on addressing such issues.

Monitoring wells may be required as determined by the Division, per Condition III.10. Division Staff does not recommend any changes to the Permit language.

18. Condition III.5 – Waste sample analysis should be required prior to application, not 60 days before or after application.

Response: This issue is addressed in the response to Oral Comment 6.

19. Condition III.9(f) – Sampling of source lagoon/storage pond should be required within twelve hours. Sampling of water receiving the discharge should also be sampled for the parameters listed within twelve hours. Sample handling practices should be specified, and samples taken to a certified laboratory. Monitoring results should be submitted within fifteen days and made public, rather than within thirty days.

Response: This issue is addressed in the response to Oral Comment 7.

Thirty days is appropriate to obtain and submit sampling data. All reports received by the Division are public record.

20. Condition III.11 – Records retention should be for five years not three years. Once every five years DENR should conduct a full compliance inspection of the facility and records.

Response: The Division conducts a full compliance inspection annually for each facility covered under these General Permits as required by G.S. §143-215.10F. All records within the required retention schedule must be made available during the inspection or submitted upon request, per Condition III.12. Division staff does not recommend any changes to the current retention schedule.

21. Condition III.14 – All permittees should be required to file an annual compliance report regardless of compliance history.

Response: The Division conducts inspections of all permitted animal operations annually as required by G.S. §143-215.10F. All records required by this Permit are reviewed by the Division during the inspection. Condition III.12 further requires the Permittee to submit any records or reports within fifteen days of request by the Division. This Condition reserves the right for the Division to require an annual report.

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22. Condition III.15 to III.17 – Terminology should be consistent across these three conditions and tie to the discharge of waste. Press release requirement in Condition III.15 should be within twenty-four hours and specify contents of the press release. Condition III.17 should be made clear that discharges of 1,000,000 gallons or more require press release and public notice be expanded to included appropriate counties recommended by the Division. Permittees should be required to contact the Division within twelve hours of a discharge of 5,000 gallons or more. Permittees should be required to maintain a copy of the press release and public notice for up to one year and to provide the Division with a copy of the notice and proof of publication.

Response: The Division agrees that the terminology should be consistent across the three Conditions. It is recommended that all three Conditions use the term "animal waste"; this is also consistent with G.S. §143-215.10C(h).

The requirement to issue a press release within forty-eight hours of a discharge of 1,000 gallons or more of animal waste to surface waters of the State is a requirement of G.S. §143-215.10C(h)(1) and cannot be changed by this process.

The requirement to publish a notice of the discharge of 15,000 gallons or more of animal waste to surface waters of the State is a requirement of G.S. §143-215.10C(h)(2) and cannot be changed by this process. The publication of a public notice is in addition to the above press release requirement.

It is recommended to add the following two sentences from G.S. §143-215.10C(h)(2) be added to Condition III.16 – "The notice shall be captioned "NOTICE OF DISCHARGE OF ANIMAL WASTE" and "The owner or operator shall file a copy of the notice and proof of publication with the Department within thirty (30) days after the notice is published. Publication of a notice of discharge under this Condition is in addition to the requirement to issue a press release under Condition III.15".

It is recommended to correct the last sentence in Condition III.17 to say "A copy of all public notices and proof of publication must be sent to the Division within thirty (30) days of the after the notice is published."

23. Condition III.18 – Two years is too long for a facility to comply with sludge removal. Compliance should be within one year, rather than two. Facilities that are not able to manage its waste should not be allowed to generate more.

Response: The Division feels that the compliance schedule is appropriate as written. Permittees must identify additional application fields and comply with the application windows for various crops. The Condition does require a Plan of Action be developed within ninety days of determination of the need or sludge removal.

24. Condition IV.1 – Permit should state that facilities are subject to random, unannounced inspections.

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Response: The Condition does not preclude random, unannounced inspections. The Division feels that the current wording is appropriate.

25. Condition V.13 – Permit should provide requirements for how systems are to be closed. Depopulated facilities should be required to maintain a permit and inspect the lagoon to ensure it is not leaking. Reopening facilities should have to demonstrate compliance with performance standards in G.S. 143-215.10I. Facilities depopulated due to forced closure or enforcement should develop a plan that rectifies past violations.

Response: Abandoned facilities are held to the conditions of this Permit until lagoon closure. As for the issue of reactivation of abandoned farms, that is addressed by 115A NCAC 02T .1302. Lagoon closure is addressed in Condition V.3, 15A NCAC 02T .1306, and NC NRCS Conservation Practice Standard No. 360 "Closure of Waste Impoundment."

26. Information Collection – Permits should be revised to require all information collected be submitted to DENR quarterly and made readily accessible to the public via a database.

Response: The Division conducts inspections of all permitted animal operations annually as required by G.S. §143-215.10F. All records required by this Permit must be submitted to the Division during the inspection for review. Condition III.12 further requires the Permittee to submit any records or reports within fifteen days of request by the Division. This Condition reserves the right for the Division to require an annual report.

27. DENR should require dry litter poultry facilities to operate under a permitting program. DENR should repeal the permitting by regulation rules applicable to dry litter poultry facilities. At a minimum, facilities that violate the regulations for deemed permitted status to obtain coverage under an individual or general permit.

Response: The General Permits presented for public review and comment are renewals of existing general permits. The introduction of a new general permit for a permitted activity should be addressed in a separate action. At this time, the Division has not received any requests for permit coverage from a dry litter poultry operation. If such a request is received, an individual permit can be issued in compliance with all applicable statutes and regulations. A general permit could be developed if multiple dry litter poultry facilities seek coverage.

<u>Comment 14:</u> Steve Wing, Ginger T. Guidry, Sarah Hatcher, and Jessica Rinsky of the UNC-CH School of Public Health submitted the following comments:

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1. Negative health impacts of industrial swine operations result from the use of lagoons and sprayfields to manage animal waste. Heath impacts are related to air pollution from barns, lagoons, and sprayfields.

Response: This issue was addressed the response to Comment 13.2.c.

2. Non-therapeutic use of antibiotics in swine production results in negative health impacts.

Response: The Division does not possess the authority to regulate the use of antibiotics in swine production. The General Permits are for non-discharge animal waste management systems in accordance with G.S. §143-215 for the protections of human health and the environment. More research and data is needed regarding emerging contaminants such as pharmaceuticals before limitations could be placed on these parameters. Establishment of such limits would be done through the legislative or rule-making process.

3. The location of confinements and animal waste in flood plains results in negative health impacts.

Response: The Swine Farm Siting Act, G.S. §106-803(a2), prohibits any component of the animal waste management system other than a land application site from being located in the 100 year flood plain. The NCDA&CS Division of Soil & Water Conservation operate a swine farm buyout program from 2000 to 2014. This program

4. The disproportionate burden of animal feeding operations impacts on communities particularly susceptible due to other environmental exposures and inadequate access to medical services.

Response: This issue was addressed the response to Comment 13.2.a.

5. DENR should compile electronic records of information that permittees are required to collect and make them publicly available.

Response: This issue was addressed the response to Comment 13.26.

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VI. REVISED STATE GENERAL PERMITS

As a result of the public comments received and further information gathered by the Division during the course of the public comment period, the Division produced revised State General Permits that incorporate the Hearing Officers' recommendations previously discussed in this report. The revised permits are provided as Attachment 7.

VII. RECOMMENDATION

Based upon the information contained in this report, consideration of the comments received, a thorough review of all the information and facts that are pertinent to the development of these permits, and an analysis of the revised permits, the Hearing Officers make the following recommendation:

- The Director should adopt the revised permits contained in Attachment 7. These permits should be issued with an effective date of October 1, 2014.
- Prior to the next renewal period, the Division should re-examine the 2002 protocol for groundwater monitoring around CAFOs to determine whether the 2002 protocol provides adequate protection of human health and the water resources of the state.
- Prior to the next renewal period, the Division should evaluate whether Tropical Storms and Hurricanes are the only extreme rainfall event that should be specifically addressed by the general permit.
- As a part of the rule review process required by Session Law 2013-413, the Division should consider whether rule changes are necessary to address those comments that the Division felt were more appropriate to address through a rulemaking process.

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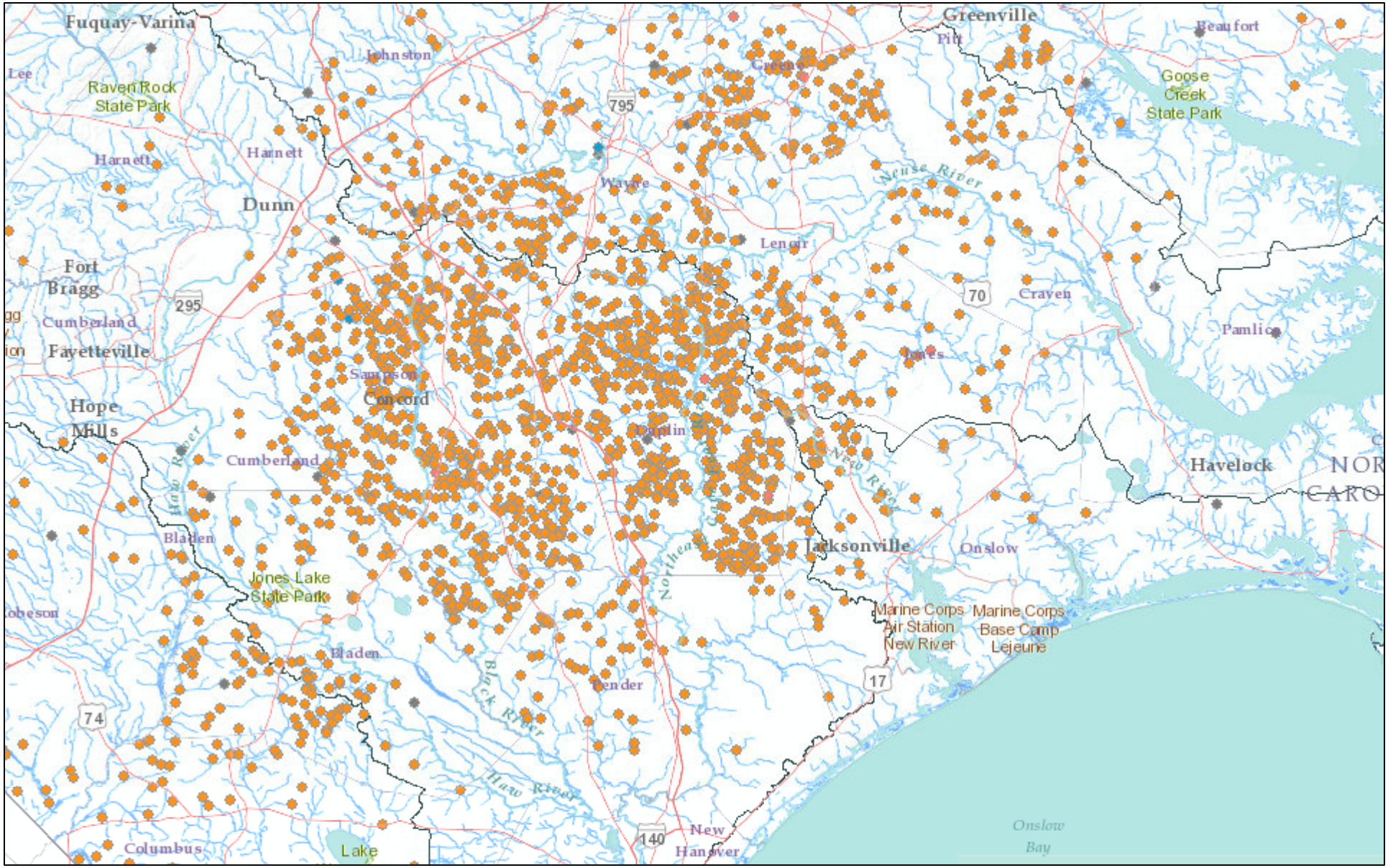
Animal Operation Permits in NC



December 2, 2016

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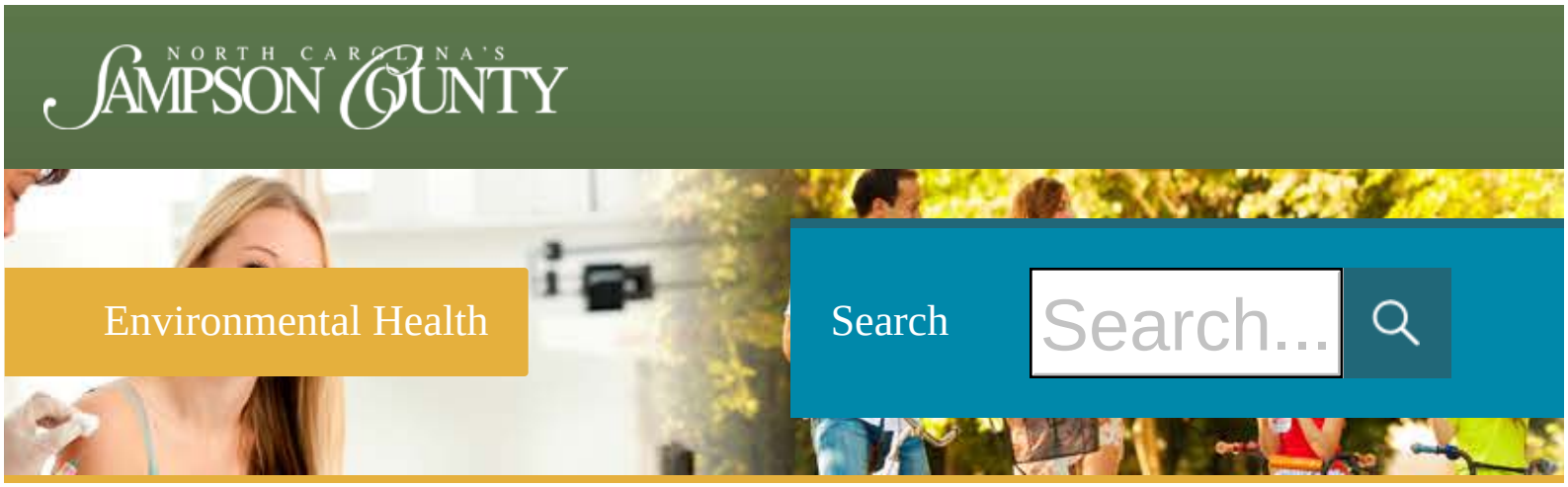
- Swine State COC
- Swine NPDES COC
- Cattle State COC
- Animal Individual State
- Major_Basins
- DWR_WQ_ClassificationsURL_Basins

NCDENR - Division of Water Resources
Sources: Esri, DeLorme, USGS, NPS

EPA-HQ-2017-000797 E-Files 000313 Wk of 2019-07-29

DENR DWR

NCDENR - Division of Water Resources | Sources: Esri, USGS, NOAA | Sources: Esri, DeLorme, USGS, NPS |



Private Water Wells

Sampson County Environmental Health inspects, sites, and permits private drinking water wells in accordance with state rules and regulations. This includes:

- Locating the well a safe distance from possible sources of contamination;
- Observing the grouting of the well to prevent potential avenues of contamination around the well casing;
- Obtaining water samples to ensure that the well is producing safe, potable water.

Water Samples

Sampson County Environmental Health provides the public with a water sampling service that allows for water to be tested for several different parameters including:

- Bacteriological
- Chemical
- Nitrates and Nitrites
- Petroleum and Pesticides

A new drinking water well requires bacteriological, chemical and nitrate and nitrite samples to be taken. The sample must be free of coliform bacteria before a certificate of completion will be issued.

Well Application and Permitting Process

1. Make application for well permit and assessed fees
2. Applicant is assigned to Environmental Health Specialist (EHS)
3. EHS will contact applicant and make appointment

4. Once on the lot, EHS will designate a site for the well meeting all standards and safe distances from any contamination.
5. Applicant is issued a permit construct well and select a well contractor
6. EHS conducts a well inspection with well contractor to ensure well meets all standards/rules
7. EHS will then collect samples (Bacteriological, Chemistry & Nitrate) to ensure well is free of coliform bacteria. Then a certificate of completion is issued to the applicant.

406 County Complex Road, Clinton, NC 28328
(910) 592-6308.
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Welcome to QuickFacts

Sampson County, North Carolina

QuickFacts provides statistics for all states and counties, and for cities and towns with a population of 5,000 or more.

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QuickFacts

People	Sampson County, North Carolina
Population	
Population estimates, July 1, 2015, (V2015)	63,724
Population estimates base, April 1, 2010, (V2015)	63,431
Population, percent change - April 1, 2010 (estimates base) to July 1, 2015, (V2015)	0.5%
Population, Census, April 1, 2010	63,431
Age and Sex	
Persons under 5 years, percent, July 1, 2015, (V2015)	6.4%
Persons under 5 years, percent, April 1, 2010	6.9%
Persons under 18 years, percent, July 1, 2015, (V2015)	24.7%
Persons under 18 years, percent, April 1, 2010	25.7%
Persons 65 years and over, percent, July 1, 2015, (V2015)	16.4%
Persons 65 years and over, percent, April 1, 2010	14.3%
Female persons, percent, July 1, 2015, (V2015)	50.8%
Female persons, percent, April 1, 2010	51.0%
Race and Hispanic Origin	
White alone, percent, July 1, 2015, (V2015) (a)	67.2%
White alone, percent, April 1, 2010 (a)	56.7%
Black or African American alone, percent, July 1, 2015, (V2015) (a)	27.0%
Black or African American alone, percent, April 1, 2010 (a)	27.0%
American Indian and Alaska Native alone, percent, July 1, 2015, (V2015) (a)	3.1%
American Indian and Alaska Native alone, percent, April 1, 2010 (a)	2.0%
Asian alone, percent, July 1, 2015, (V2015) (a)	0.6%
Asian alone, percent, April 1, 2010 (a)	0.4%
Native Hawaiian and Other Pacific Islander alone, percent, July 1, 2015, (V2015) (a)	0.3%
Native Hawaiian and Other Pacific Islander alone, percent, April 1, 2010 (a)	0.1%
Two or More Races, percent, July 1, 2015, (V2015)	1.8%
Two or More Races, percent, April 1, 2010	2.0%
Hispanic or Latino, percent, July 1, 2015, (V2015) (b)	18.8%
Hispanic or Latino, percent, April 1, 2010 (b)	16.5%
White alone, not Hispanic or Latino, percent, July 1, 2015, (V2015)	51.9%
White alone, not Hispanic or Latino, percent, April 1, 2010	53.2%
Population Characteristics	

Veterans, 2010-2014	4,183
Foreign born persons, percent, 2010-2014	9.2%
Housing	
Housing units, July 1, 2015, (V2015)	27,056
Housing units, April 1, 2010	27,234
Owner-occupied housing unit rate, 2010-2014	69.8%
Median value of owner-occupied housing units, 2010-2014	$87,700
Median selected monthly owner costs -with a mortgage, 2010-2014	$1,041
Median selected monthly owner costs -without a mortgage, 2010-2014	$357
Median gross rent, 2010-2014	$598
Building permits, 2015	76
Families and Living Arrangements	
Households, 2010-2014	23,413
Persons per household, 2010-2014	2.69
Living in same house 1 year ago, percent of persons age 1 year+, 2010-2014	86.7%
Language other than English spoken at home, percent of persons age 5 years+, 2010-2014	15.5%
Education	
High school graduate or higher, percent of persons age 25 years+, 2010-2014	74.2%
Bachelor's degree or higher, percent of persons age 25 years+, 2010-2014	12.1%
Health	
With a disability, under age 65 years, percent, 2010-2014	13.6%
Persons without health insurance, under age 65 years, percent	⚠ 20.3%
Economy	
In civilian labor force, total, percent of population age 16 years+, 2010-2014	60.6%
In civilian labor force, female, percent of population age 16 years+, 2010-2014	55.1%
Total accommodation and food services sales, 2012 ($1,000) (c)	D
Total health care and social assistance receipts/revenue, 2012 ($1,000) (c)	179,412
Total manufacturers shipments, 2012 ($1,000) (c)	821,833
Total merchant wholesaler sales, 2012 ($1,000) (c)	450,617
Total retail sales, 2012 ($1,000) (c)	593,013
Total retail sales per capita, 2012 (c)	$9,273
Transportation	
Mean travel time to work (minutes), workers age 16 years+, 2010-2014	26.1
Income and Poverty	
Median household income (in 2014 dollars), 2010-2014	$35,731
Per capita income in past 12 months (in 2014 dollars), 2010-2014	$19,463
Persons in poverty, percent	⚠ 29.0%

Businesses	Sampson County, North Carolina
Total employer establishments, 2014	982
Total employment, 2014	13,654
Total annual payroll, 2014	420,358
Total employment, percent change, 2013-2014	-1.1%
Total nonemployer establishments, 2014	3,386
All firms, 2012	3,605
Men-owned firms, 2012	2,109

Women-owned firms, 2012	1,206
Minority-owned firms, 2012	945
Nonminority-owned firms, 2012	2,525
Veteran-owned firms, 2012	456
Nonveteran-owned firms, 2012	2,958

Geography	Sampson County, North Carolina
Population per square mile, 2010	67.1
Land area in square miles, 2010	944.74
Metropolitan or Micropolitan Statistical Area	None
FIPS Code	37163

Export to CSV Export to Excel

This geographic level of poverty and health estimates are not comparable to other geographic levels of these estimates

Some estimates presented here come from sample data, and thus have sampling errors that may render some apparent differences between geographies statistically indistinguishable. Click the Quick Info icon to the left of each row in TABLE view to learn about sampling error.

The vintage year (e.g., V2015) refers to the final year of the series (2010 thru 2015).
Different vintage years of estimates are not comparable.

(a) Includes persons reporting only one race
(b) Hispanics may be of any race, so also are included in applicable race categories
(c) Economic Census - Puerto Rico data are not comparable to U.S. Economic Census data

D Suppressed to avoid disclosure of confidential information
F Fewer than 25 firms
FN Footnote on this item in place of data
NA Not available
S Suppressed; does not meet publication standards
X Not applicable
Z Value greater than zero but less than half unit of measure shown

Up one level

North Carolina

QuickFacts data are derived from: Population Estimates, American Community Survey, Census of Population and Housing, Current Population Survey, Small Area Health Insurance Estimates, Small Area Income and Poverty Estimates, State and County Housing Unit Estimates, County Business Patterns, Nonemployer Statistics, Economic Census, Survey of Business Owners, Building Permits.

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Survey of Business Owners

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2010 Census
American Community Survey
Income
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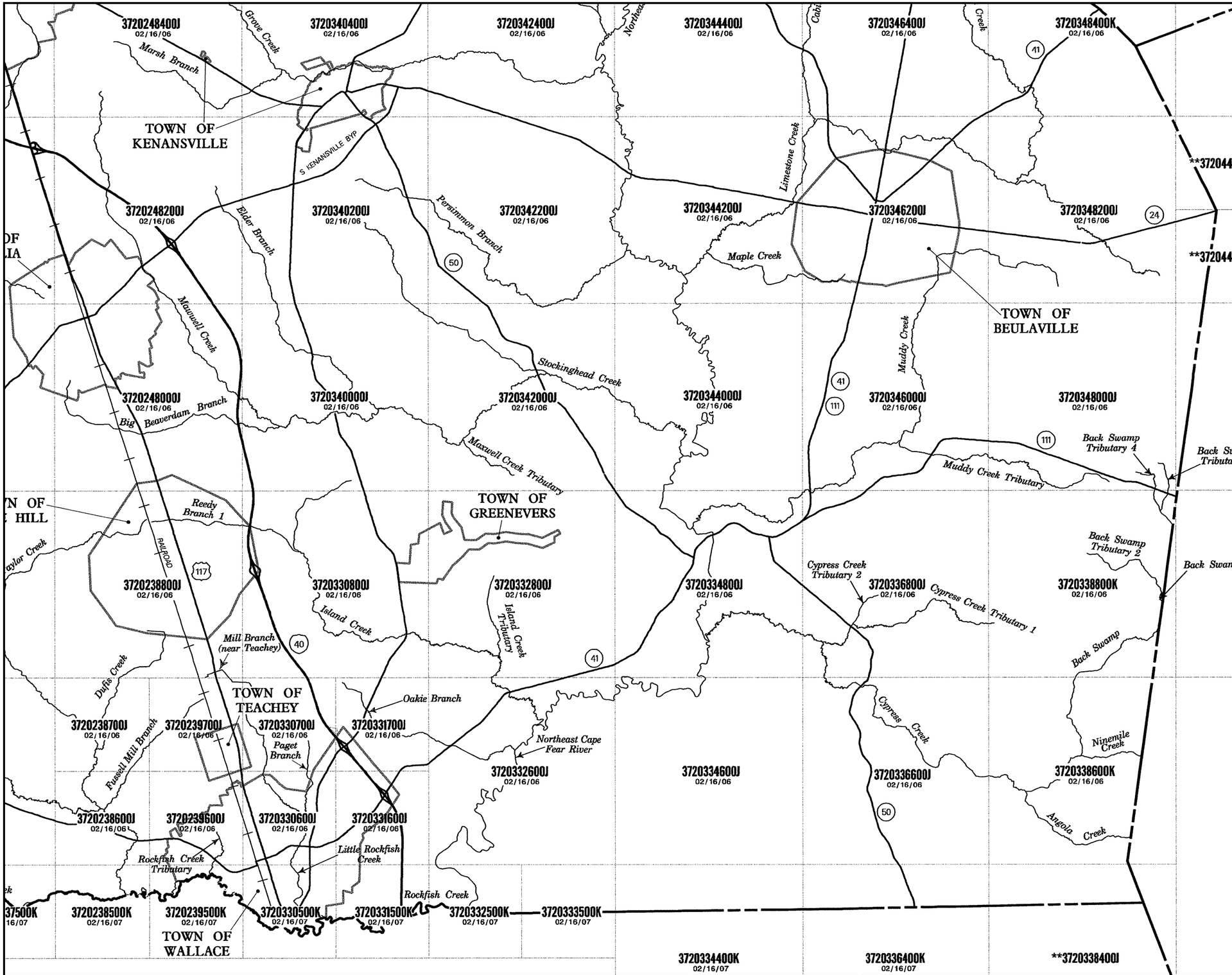


FIRM
FLOOD INSURANCE RATE MAP

DUPLIN COUNTY,
NORTH CAROLINA
AND INCORPORATED AREAS

(SEE LISTING OF COMMUNITIES TABLE)

MAP INDEX

PANEL PRINTED: 2344, 2346, 2348, 2365, 2366, 2368, 2375, 2385, 2386, 2387, 2388, 2395, 2396, 2397, 2440, 2442, 2446, 2448, 2460, 2462, 2464, 2466, 2468, 2480, 2482, 2484, 2486, 2488, 2540, 2542, 2552, 2560, 2580, 2582, 2592, 3305, 3306, 3307, 3308, 3315, 3316, 3317, 3325, 3326, 3328, 3335, 3344, 3346, 3348, 3364, 3366, 3368, 3386, 3388, 3400, 3402, 3404, 3406, 3408, 3420, 3422, 3424, 3426, 3428, 3440, 3442, 3444, 3446, 3448, 3460, 3462, 3464, 3466, 3468, 3480, 3482, 3484, 3501, 3502, 35'0, 3511, 3520, 3521, 3530, 3531, 3540, 3560, 3561, 4400

MAP REVISED
FEBRUARY 16, 2007

MAP NUMBER
37061CIND0C

State of North Carolina
Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

NORTH CAROLINA
ENVIRONMENTAL MANAGEMENT COMMISSION
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

SWINE WASTE MANAGEMENT SYSTEM GENERAL PERMIT

This General Permit is issued pursuant to North Carolina G.S. §143-215 et seq., may apply to any swine facility in the State of North Carolina, and shall be effective from October 1, 2014 until September 30, 2019.

All activities authorized herein shall be consistent with the terms and conditions of this General Permit.

Holders of Certificates of Coverage (COC) under this General Permit shall comply with the following specified conditions and limitations.

I. PERFORMANCE STANDARDS

1. Any discharge of waste that reaches surface waters or wetlands is prohibited except as otherwise provided in this General Permit and associated statutory and regulatory provisions. Waste shall not reach surface waters or wetlands by runoff, drift, manmade conveyance, direct application, direct discharge or through ditches, terraces, or grassed waterways not otherwise classified as state waters.

   The waste collection, treatment, storage and application system operated under this General Permit shall be effectively maintained and operated as a non-discharge system to prevent the discharge of pollutants to surface waters or wetlands. Application of waste to terraces and grassed waterways is acceptable as long as it is applied in accordance with Natural Resources Conservation Service (NRCS) Standards and does not result in a discharge of waste to surface waters or wetlands.

   Facilities must be designed, constructed, operated, and maintained to contain all waste plus the runoff from a 25-year, 24-hour rainfall event for the location of the facility. A facility that has a discharge of waste that results because of a storm event more severe than the 25-year, 24-hour storm will not be considered to be in violation of this General Permit if the facility is otherwise in compliance with its Certified Animal Waste Management Plan (CAWMP) and this General Permit.

   Any discharge or application of waste to a ditch that drains to surface waters or wetlands is prohibited except as follows: (a) discharges from the ditches are controlled by best management practices (BMPs) designed in accordance with NRCS standards; (b) the BMPs have been submitted to and approved by the Division of Water Resources (Division); (c) the BMPs were implemented as designed to prevent a discharge to surface waters or wetlands; (d) the waste was removed immediately from the ditch upon discovery; and (e) the event was documented and reported in accordance with Condition III.13. of this General Permit. Nothing in this exception shall excuse a discharge to surface waters or wetlands except as may result because of rainfall from a storm event more severe than the 25-year, 24-hour storm.

2. This General Permit does not allow the Permittee to cause a violation of any of the water quality standards established pursuant to Title 15A, Subchapter 2B of the North Carolina Administrative Code and Title 15A, Subchapter 2L of the North Carolina Administrative Code.

3. The facility's COC and its CAWMP are hereby incorporated by reference into this General Permit. The CAWMP must be consistent with all applicable laws, rules, ordinances, and standards (federal, state and local) in effect at the time of siting, design and certification of the facility.

   The Permittee must assess and record, on an ongoing basis, the effectiveness of the implementation of the CAWMP. The Permittee must make "major changes," "revisions," or "amendments" to the CAWMP, as defined in Section VII, "Definitions," of this General Permit, in order to address any changes needed to maintain compliance with the facility's COC and this General Permit. "Major changes," "revisions," and "amendments" to the CAWMP must be documented, dated, and included as part of the CAWMP. "Major changes " and "revisions" to the CAWMP shall be submitted to the appropriate Division Regional Office within thirty (30) calendar days of the "major change" or "revision." "Amendments" are not required to be submitted to the Division Regional Office unless specifically requested by the Division. If field, riser or pull numbers are changed, an explanation shall also be submitted and include a description of how the new numbers relate to the old numbers.

   Any violation of the COC or the CAWMP shall be considered a violation of this General Permit and subject to enforcement actions. A violation of this General Permit may result in the Permittee having to take immediate or long-term corrective action(s) as required by the Division. These actions may include but are not limited to: modifying the CAWMP; ceasing land application of waste; removing animals from the facility; or the COC being reopened and modified, revoked and reissued, and/or terminated.

4. Any proposed increase or modification to the annual average design capacity from that authorized by the COC will require a modification to the CAWMP and the COC prior to modification of the facility. All new and expanding operations must demonstrate that waste management system will satisfy the requirements of G.S. §143-215.10.I. No collection, treatment or storage facilities may be constructed in a 100-year flood plain.

5. Facilities located in watersheds sensitive to nutrient enrichment may be notified by the Division to conduct an evaluation of the facility and its CAWMP to determine the facility's ability to comply with the NRCS nutrient management standard as it relates to phosphorous. This evaluation will not be required until such time as the permittee is notified by the Division. The evaluation must be documented on forms supplied by or approved by the Division and must be submitted to the Division. This evaluation must be completed by existing facilities within twelve (12) months of receiving notification from the Division.

   For facilities located in watersheds sensitive to nutrient enrichment, all fields with a "HIGH" phosphorous-loss assessment rating shall have land application rates that do not exceed the established crop removal rate for phosphorous. There shall be no waste application on fields with a "VERY HIGH" phosphorous-loss assessment rating.

6. If prior approval is received from the Director of the Division (Director), facilities that have been issued a COC to operate under this General Permit may add treatment units for the purpose of removing pollutants before the waste is discharged into the lagoons/storage ponds. Prior to any approval, the Permittee must demonstrate to the satisfaction of the Director that the new treatment unit will not interfere with the operation of the existing treatment system and that a process is in place to properly manage and track the pollutants removed.

7. If prior approval is received from the Director, facilities that have been issued a COC to operate under this General Permit may add innovative treatment processes to the systems on a pilot basis in order to determine if the innovative treatment process will improve how the waste is treated and/or managed. Prior to any approval, the Permittee must demonstrate to the satisfaction of the Director that the innovative treatment process will not interfere with the operation of the existing treatment system and that a process is in place to properly manage and track the pollutants removed.

8. Animal waste shall not be applied within 100 feet of any well with the exception of monitoring wells. The allowable distance to monitoring wells shall be established on a case-by-case basis by the Division.

9. Existing swine dry lots may remain in wetlands as long as the wetlands uses are not removed or degraded as a result of the swine. The swine however may not be confined within 100 feet of an adjacent surface water or a seasonally-flooded area. The swine also must not cause a loss of more than 10% of the existing tree canopy. Where trees do not exist, the area must be managed to include crop rotation.

II. OPERATION AND MAINTENANCE REQUIREMENTS

1. The collection, treatment, and storage facilities, and the land application equipment and fields shall be properly operated and maintained at all times.

2. A vegetative cover shall be maintained as specified in the facility's CAWMP on all land application fields and buffers in accordance with the CAWMP. No waste shall be applied upon areas not included in the CAWMP or upon areas where the crop is insufficient for nutrient utilization. However, if the CAWMP allows, then waste may be applied up to thirty (30) days prior to planting or breaking dormancy.

3. Soil pH on all land application fields must be maintained in the optimum range for crop production.

4. Land application rates shall be in accordance with the CAWMP. In no case shall land application rates exceed the agronomic rate of the nutrient of concern for the receiving crop.

5. In no case shall land application rates result in excessive ponding or any runoff during any given application event.

6. Animal waste shall not be directly applied onto crops for direct human consumption that do not undergo further processing (e.g., strawberries, melons, lettuce, cabbage, apples, etc.) at any time during the growing season, or in the case of fruit bearing trees, following breaking dormancy. Application of animal wastes shall not occur within thirty (30) days of the harvesting of fiber and food crops for direct human consumption that undergoes further processing.

7. If manure or sludges are applied on conventionally tilled bare soil, the waste shall be incorporated into the soil within two (2) days after application on the land, or prior to the next rainfall event, whichever occurs first. This requirement does not apply to no-till fields, pastures, or fields where crops are actively growing.

8. No material other than animal wastes of the type generated on this facility shall be disposed of in the animal waste collection, treatment, storage, or application systems. This includes but is not limited to pesticides, toxic chemicals and petroleum products.

9. Domestic and/or industrial wastewater from showers, toilets, sinks, etc. shall not be discharged into the animal waste collection, treatment, storage, and application system. Washdown of stock trailers owned by and used to transport animals to and from the facility only, will be permissible as long as the system has been evaluated and approved to accommodate the additional volume. Only those cleaning agents and soaps that are EPA approved according to their label, will not harm the cover crop, and will not contravene the groundwater standards listed in 15A NCAC 2L may be utilized in facilities covered by this General Permit. Instruction labels are to be followed when using cleaning agents and soaps.

10. Disposal of dead animals resulting from normal mortality rates associated with the facility shall be done in accordance with the facility's CAWMP and the North Carolina Department of Agriculture and Consumer Services (NCDA&CS) Veterinary Division's Statutes and regulations.

    Disposal of dead animals whose numbers exceed normal mortality rates associated with the facility shall also be done in accordance with the facility's CAWMP and NCDA&CS Veterinary Division's Statutes and regulations provided that: 1) burial of such animals shall be done in consultation with the State Veterinarian of the NCDA&CS Veterinary Division's Statutes and in compliance with NCDA&CS regulations; 2) all such burial sites must be mapped, and the dates and numbers of the animals buried by species and type must be recorded; and 3) the map is submitted within fifteen (15) calendar days of burial to the Water Quality Regional Operations Section located within the appropriate Regional Office.

    In the event of a state of emergency declared by the Governor, disposal of dead animals shall be done in accordance with requirements and guidelines dictated by the State Veterinarian according G.S. §106-402.1. The Division may require groundwater monitoring when there is massive burial of animals. All burial sites of such animals must be mapped, and the dates and numbers of the animals buried by species and type must be recorded.

11. Unless accounted for in temporary storage volume, all uncontaminated runoff from the surrounding property and buildings shall be diverted away from the waste lagoons/storage ponds to prevent any unnecessary addition to the liquid volume in the structures.

12. A protective vegetative cover shall be established and maintained on all earthen lagoon/storage pond embankments (outside toe of embankment to maximum pumping elevation), berms, pipe runs, and diversions to surface waters or wetlands. Trees, shrubs, and other woody vegetation shall not be allowed to grow on the lagoon/storage pond embankments. All trees shall be removed in accordance with good engineering practices. Lagoon/storage pond areas shall be accessible, and vegetation shall be kept mowed.

13. At the time of sludge removal from a lagoon/storage pond, the sludge must be managed in accordance with the CAWMP. When removal of sludge from the lagoon is necessary, provisions must be taken to prevent damage to the lagoon dikes and liner.

14. Lagoons/storage ponds shall be kept free of foreign debris including, but not limited to, tires, bottles, light bulbs, gloves, syringes or any other solid waste.

15. The facility must have at least one of the following items at all times: (a) adequate animal waste application and handling equipment, (b) a lease, or other written agreement, for the use of the necessary equipment, or (c) a contract with a third party applicator capable of providing adequate waste application.

16. The Permittee shall designate a certified animal waste management system operator with a valid certification to be in charge of the animal waste management system. The waste management system shall be operated by the Operator in Charge (OIC) or a person under the OIC's supervision.

17. In accordance with 15A NCAC 8F .0203(b)(2), the OIC or a designated back-up OIC of a Type A Animal Waste Management System shall inspect, or a person under the supervision of an OIC or designated back-up OIC shall inspect, the land application site as often as necessary to insure that the animal waste is land applied in accordance with the CAWMP. In no case shall the time between inspections be more than 120 minutes during the application of waste. A record of each inspection shall be recorded on forms supplied by, or approved by, the Division and shall include the date, time, sprayfield number and name of the operator for each inspection. Inspection shall include but not be limited to visual observation of application equipment, spray fields, subsurface drain outlets, ditches, and drainage ways for any discharge of waste.

    The Permittee may assert as an affirmative defense in any enforcement action alleging noncompliance with the requirements imposed in this condition that such noncompliance was due to circumstances beyond the Permittee's control. A notation shall be made on the form indicating the inspection affected by such circumstance and an explanation setting forth the circumstances claimed to have been beyond the Permittee's control shall be submitted with the form.

18. The Director may require any permittee to install and operate flow meters with flow totalizers based on the facility's violations and/or incomplete or incorrect record keeping events.

19. No waste shall be applied in wind conditions that might reasonably be expected to cause the mist to reach surface waters or wetlands or cross property lines or field boundaries.

20. The Permittee shall maintain buffer strips or other equivalent practices as specified in the facility's CAWMP near feedlots, manure storage areas and land application areas.

21. Waste shall not be applied on land that is flooded, saturated with water, frozen or snow covered at the time of land application.

22. Land application of waste is prohibited during precipitation events. The Permittee shall consider pending weather conditions in making the decision to land apply waste and shall document the weather conditions at the time of land application on forms supplied by or approved by the Division.

    Land application of waste shall cease within four (4) hours of the time that the National Weather Service issues a Hurricane Warning, Tropical Storm Warning, or a Flood Watch associated with a tropical system including a hurricane, tropical storm, or tropical depression for the county in which the permitted facility is located. Watches and warnings are posted on the National Weather Service's website located at: **www.weather.gov**. More detailed website information can be found on Page 2 of the Certificate of Coverage. Watch and warning information can also be obtained by calling the local National Weather Service Office that serves the respective county, which can be found on Page 2 of the Certificate of Coverage.

    The Director may require any permittee to install, operate and maintain devices on all irrigation pumps/equipment designed to automatically stop irrigation activities during precipitation. This decision will be based on the facility's compliance history for irrigation events.

23. Land application activities shall cease on any application site that exceeds a Mehlich 3 Soil Test Index for Copper of greater than 3,000 (108 pounds per acre) or Zinc of greater than 3,000 (213 pounds per acre).

24. All waste application equipment must be tested and calibrated at least once every two years. The results must be documented on forms provided by, or approved by, the Division.

25. Any major structural repairs to lagoons/storage ponds must have written documentation from a technical specialist certifying proper design and installation. However, if a piece of equipment is being replaced with a piece of equipment of the identical specifications, no technical specialist approval is necessary [i.e. piping, reels, valves, pumps (if the gallons per minute (gpm) capacity is not being increased or decreased), etc.] unless the replacement involves disturbing the lagoon/storage pond embankment or liner.

26. Crops for which animal waste is land applied must be removed from the land application site and properly managed and utilized unless other management practices are approved in the CAWMP.

27. In accordance with NRCS North Carolina Conservation Practice Standard No. 359 "Waste Treatment Lagoon", an operator may temporarily lower lagoon levels to provide irrigation water during drought periods and to provide additional temporary storage for excessive rainfall during the hurricane season and in preparation for the following winter months. All conditions of NRCS NC Standard No. 359 must be satisfied prior to lowering lagoon levels below designed stop pump levels.

III. MONITORING AND REPORTING REQUIREMENTS

1. An inspection of the waste collection, treatment, and storage structures, and runoff control measures shall be conducted and documented at a frequency to insure proper operation but at least monthly and after all storm events of greater than one (1) inch in 24 hours. For example, lagoons/storage ponds, and other structures should be inspected for evidence of erosion, leakage, damage by animals or discharge. Inspection shall also include visual observation of subsurface drain outlets, ditches, and drainage ways for any discharge of waste.

2. Monitoring and Recording Freeboard Levels

   a. Highly visible waste-level gauges shall be maintained to mark the level of waste in each lagoon/storage pond that does not gravity feed through a free flowing transfer pipe into a subsequent structure. The gauge shall have readily visible permanent markings.

      The waste level in each lagoon with a waste level gauge shall be monitored and recorded weekly on forms supplied by or approved by the Division.

      The Director may require more frequent monitoring and recording of waste levels based on the facility's compliance history for freeboard violations.

   b. Any facility which experiences freeboard violations in any two consecutive years following the issuance of this General Permit, or as determined necessary by the Director, shall monitor and record waste levels as follows:

In addition to the facility's existing lagoon waste-level gauges, automated lagoon/storage pond waste-level monitors and recorders (monitored and recorded at least hourly) must be installed on all treatment and storage structures covered by a COC issued under this General Permit to measure and record freeboard. This equipment must be properly maintained and calibrated in a manner consistent with manufacturer's operation and maintenance recommendations. This automated equipment must be in place no later than ninety (90) days following notification from the Director. 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.

If an automated level monitor(s) becomes inoperable, the Permittee shall:

i. report the problem by telephone to the appropriate Division Regional Office as soon as possible, but in no case more than 24 hours following first knowledge of the problem; and,

ii. make any needed repairs to the equipment as quickly as possible, and take and record daily waste levels at the same time every day until such time as the automated equipment is placed back into operation.

c. The Director may require new or modified waste-level gauges at any facility if it is determined that the existing gauges are not adequate to accurately indicate actual lagoon levels, or the various lagoon levels required to be maintained by this General Permit or the facility's CAWMP.

3. Monitoring and Recording Precipitation Events

a. Precipitation events at facilities issued a COC to operate under this General Permit shall be monitored and recorded as follows:

A rain gauge must be installed at a site that is representative of the weather conditions at the farm's land application site(s) to measure all precipitation events. The precipitation type and amount must be recorded daily for all precipitation events and maintained on site for review by the Department of Environment and Natural Resources (Department).Daily records do not need to be maintained for those days without precipitation events.

b. The Director may require that an automated rain gauge and recorder must be installed on site to measure and record all precipitation events. This equipment must be properly maintained and calibrated in a manner consistent with manufacturer's operation and maintenance recommendations. This automated equipment must be in place no later than ninety (90) days following receipt of notice from the Director.

If an automated rain gauge(s) becomes inoperable, the Permittee shall:

i. report the problem by telephone to the appropriate Division Regional Office as soon as possible, but in no case more than twenty four (24) hours following first knowledge of the problem; and,

ii. make any needed repairs to the equipment as quickly as possible, and take and record all rainfall events until such time as the automated equipment is placed back into operation.

4. A representative Standard Soil Fertility Analysis, including pH, phosphorus, copper, and zinc, shall be conducted on each application field receiving animal waste in accordance with G.S. § 143-215.10C(e)(6). As of the effective date of this General Permit, the Statute requires that the analysis be conducted at least once every three years.

5. An analysis of a representative sample of the animal waste to be applied shall be conducted in accordance with recommended laboratory sampling procedures as close to the time of application as practical and at least within sixty (60) days (before or after) of the date of application. Every reasonable effort shall be made to have the waste analyzed prior to the date of application and as close to the time of waste application as possible. This analysis shall include the following parameters:

Nitrogen	Zinc
Phosphorus	Copper

6. The Permittee shall record all irrigation and land application event(s) including hydraulic loading rates, nutrient loading rates and cropping information. The Permittee shall also record removal of solids and document nutrient loading rates if disposed of on-site, or record the off-site location(s). These records must be on forms supplied by, or approved by, the Division.

7. A record shall be created and maintained of all transfers of waste between waste structures on the same site not typically operated in series. Such record shall include at least the identity of the structure from which the waste was transferred, the identity of the structure receiving the waste, the date and time of transfer and the total volume of waste transferred.

8. The Permittee must maintain monthly stocking records for the facility and make the records available to the Department.

9. If, for any reason, there is a discharge from the waste collection, treatment, storage and application systems (including the land application sites), to surface waters or wetlands, the Permittee is required to make notification in accordance with Condition III. 13. The discharge notification shall include the following information:

   a. Description of the discharge: A description of the discharge including an estimate of the volume discharged, a description of the flow path to the receiving surface waters or wetlands and a site sketch showing the path of the waste.

   b. Time of the discharge: The length of time of the discharge, including the exact dates and times that it started and stopped, and if not stopped, the anticipated time the discharge is expected to continue.

   c. Cause of the discharge: A detailed statement of the cause of the discharge. If caused by a precipitation event, detailed information from the on-site rain gauge concerning the inches and duration of the precipitation event.

   d. All steps being taken to reduce, stop and cleanup the discharge. All steps to be taken to prevent future discharges from the same cause.

   e. Analysis of the waste: A copy of the last waste analysis conducted as required by Condition III. 5. above.

   f. A waste sample, obtained within seventy-two (72) hours following first knowledge of the discharge to surface waters or wetlands, from the source lagoon/storage pond, shall be analyzed for the following minimum parameters:

Fecal coliform bacteria	Five-day biochemical oxygen demand (BOD_5)
Total suspended solids	Total phosphorous
Ammonia nitrogen (NH_3-N)	Total Kjeldahl nitrogen (TKN)
Nitrate nitrogen (NO_3-N)	

Monitoring results must be submitted to the Division within thirty (30) days of the discharge event.

10. In accordance with 15A NCAC 02T .0108(c), the Division may require any monitoring and reporting (including but not limited to groundwater, surface water or wetland, waste, sludge, soil, lagoon/storage pond levels and plant tissue) necessary to determine the source, quantity, quality, and effect of animal waste upon the surface waters, groundwaters or wetlands. Such monitoring, including its scope, frequency, duration and any sampling, testing, and reporting systems, shall meet all applicable Division requirements.

11. A copy of this General Permit, the facility's COC, certification forms, lessee and landowner agreements, the CAWMP and copies of all records required by this General Permit and the facility's CAWMP shall be maintained by the Permittee in chronological and legible form for three (3) years. Records include but are not limited to: soil and waste analyses, rain gauge readings, freeboard levels, irrigation and land application event(s), past inspection reports and operational reviews, animal stocking records, records of additional nutrient sources applied (including but not limited to sludges, unused feedstuff leachate, milk waste, septage and commercial fertilizer), cropping information, waste application equipment testing and calibration, and records of removal of solids to off-site location(s). These records shall be maintained on forms provided or approved by the Division and shall be readily available at the facility (stored at places such as the farm residence, office, outbuildings, etc.) where animal waste management activities are being conducted.

12. Within fifteen (15) working days of receiving the request from the Division, the Permittee shall provide to the Division one (1) copy of all requested information and reports related to the operation of the animal waste management system. Once received by the Division, all such information and reports become public information, unless they constitute confidential information under G.S. § 132-1.2, and shall be made available to the public by the Division as specified in Chapter 132 of the General Statutes.

13. Regional Notification:

    The Permittee shall report by telephone to the appropriate Division Regional Office as soon as possible, but in no case more than twenty-four (24) hours following first knowledge of the occurrence of any of the following events:

    a. Failure of any component of the animal waste management system resulting in a discharge to ditches, surface waters, or wetlands.

    b. Any failure of the waste treatment and disposal system that renders the facility incapable of adequately receiving, treating, or storing the waste and/or sludge.

    c. A spill or discharge from a vehicle transporting waste or sludge to the land application field which results in a discharge to ditches, surface waters, or wetlands or an event that poses a serious threat to surface waters, wetlands, or human health and safety.

    d. Any deterioration or leak in a lagoon/storage pond that poses an immediate threat to the environment or human safety or health.

e. Failure to maintain storage capacity in a lagoon/storage pond greater than or equal to that required in Condition V.2. of this General Permit.

f. Failure to maintain waste level in a lagoon/storage pond below that of the designed structural freeboard (twelve (12) inches from top of dam or as specified in lagoon/storage pond design). Note that this notification is in addition to the report required by Condition III.13.e above.

g. An application of waste either in excess of the limits set out in the CAWMP or where runoff enters ditches, surface waters, or wetlands.

h. Any discharge to ditches, surface waters, or wetlands or any discharge that poses a serious threat to the environment or human health or safety.

For any emergency, which requires immediate reporting after normal business hours, contact must be made with the Division of Emergency Management at **1-800-858-0368**.

The Permittee shall also file a written report to the appropriate Division Regional Office within five (5) calendar days following first knowledge of the occurrence. This report shall outline the actions taken or proposed to be taken to correct the problem and to ensure that the problem does not recur. In the event of storage capacity violations as described in Condition III.13.e, the written report shall outline the actions proposed to be taken to restore compliance within thirty (30) calendar days. The requirement to file a written report may not be waived by the Division Regional Office.

In the event the waste level in a lagoon/storage pond is found to be within the designed structural freeboard, the Permittee shall file a written report to the appropriate Division Regional Office within two (2) calendar days following first knowledge of the occurrence. This report shall outline actions taken or proposed to be taken to reduce waste levels below the designed structural freeboard within five (5) calendar days of first knowledge of the occurrence.

14. The Director may require any permittee to file an annual certification report or other reports/certifications based on the compliance history of the facility. If required, the report must be filed on forms provided by the Division.

15. In the event of a discharge of 1,000 gallons or more of animal waste to surface waters or wetlands, the Permittee must issue a press release to all print and electronic news media that provide general coverage in the county in which the discharge occurred setting out the details of the discharge. The press release must be issued within forty-eight (48) hours after it is determined that the discharge has reached the surface waters or wetlands. A copy of the press release and a list of the news media to which it was distributed must be kept for at least one (1) year after the discharge and must be distributed to any person upon request.

16. In the event of a discharge of 15,000 gallons or more of animal waste to surface waters or wetlands, a public notice is required in addition to the press release described in Condition III 15. The public notice must be placed in a newspaper having general circulation in the county in which the discharge occurred and the county immediately downstream within ten (10) days of the discharge. The notice shall be captioned "NOTICE OF DISCHARGE OF ANIMAL WASTE". The minimum content of the notice is the name of the facility, location of the discharge, estimated volume of waste entering state waters, time and date discharge occurred, duration of the discharge, identification water body that was discharged into including creek and river basin if applicable, actions taken to prevent further discharge, and a facility contact person and phone number. The owner or operator shall file a copy of the notice and proof of publication with the Department within thirty (30) days after the notice is published. Publication of a notice of discharge under this Condition is in addition to the requirement to issue a press release under Condition III.15.

17. If a discharge of 1,000,000 gallons or more of animal waste reaches surface waters or wetlands, the appropriate Division Regional Office must be contacted to determine in what additional counties, if any, a public notice must be published. A copy of all public notices and proof of publication must be sent to the Division within thirty (30) days after the notice is published.

18. All facilities, which are issued a COC to operate under this General Permit, shall conduct a survey of the sludge accumulation in all lagoons every year. The survey report should be written on forms provided or approved by the Division and shall include a sketch showing the depth of sludge in the various locations within each lagoon. This survey frequency may be reduced if it can be demonstrated to the satisfaction of the Division that the rate of sludge accumulation does not warrant an annual survey.

    If the sludge accumulation is such that the structure does not satisfy the criteria set by NRCS NC Conservation Practice Standard No. 359, a sludge removal or management plan must be submitted to the appropriate Division Regional Office within ninety (90) days of the determination. The plan shall describe removal and waste utilization procedures to be used. Compliance regarding sludge levels must be achieved within two (2) years of the determination.

IV. INSPECTIONS AND ENTRY

1. The Permittee shall allow any authorized representative of the Department, upon the presentation of credentials and other documents as may be required by law and in accordance with reasonable and appropriate biosecurity measures, to:

    a. Enter the Permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this General Permit;

    b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this General Permit;

    c. Inspect, at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this General Permit; and,

    d. Sample or monitor, at reasonable times, for the purpose of assuring permit compliance, any substances or parameters at any location.

V. GENERAL CONDITIONS

1. The issuance of a COC to operate under this General Permit shall not relieve the Permittee of the responsibility for compliance with all applicable surface water, wetlands, groundwater and air quality standards or for damages to surface waters, wetlands or groundwaters resulting from the animal operation.

2. The maximum waste level in lagoons/storage ponds shall not exceed that specified in the facility's CAWMP. At a minimum, maximum waste level for lagoons/storage ponds must not exceed the level that provides adequate storage to contain the 25-year, 24-hour storm event plus an additional one (1) foot of structural freeboard except that there shall be no violation of this condition if: (a) there is a storm event more severe than a 25-year, 24-hour event, (b) the Permittee is in compliance with its CAWMP, and (c) there is at least one (1) foot of structural freeboard.

   In addition to the above requirements, for new and expanding farms with lagoon and storage pond designs completed after September 1, 1996, storage must also be provided for the heavy rainfall factor for the lagoons/storage pond. In case of lagoons/storage ponds in series that are gravity fed, the 25-year, 24-hour storm event and/or the heavy rainfall factor storage requirement for the system may be designed into the lowest lagoon/storage pond in the system. However, adequate freeboard must be designed into the upper lagoons/storage ponds to allow sufficient storage to prevent the waste level from rising into the structural freeboard while the storm water is draining into the lowest structure in the system.

3. Any containment basin, such as a lagoon or a storage pond, used for waste management shall continue to be subject to the conditions and requirements of this General Permit until properly closed. When the containment basin is properly closed in accordance with the NRCS NC Conservation Practice Standard No. 360 "Closure of Waste Impoundments," February 2008 or any subsequent amendment, the containment basin shall not be subject to the requirements of this General Permit. The Permittee must submit a letter to the Division to request rescission of the COC by providing documentation of closure of all containment basins.

   Closure shall also include a minimum of 24 hours pre-notification of the Division and submittal of the Animal Waste Storage Pond and Lagoon Closure Report Form to the address identified on the form within fifteen (15) days of completion of closure.

4. This General Permit allows for the distribution of up to four (4) cubic yards of manure per visit to individuals for personal use. The maximum distribution of manure per individual for personal use is ten (10) cubic yards per year. The Permittee must provide the recipient(s) with information on the nutrient content of the manure. Distribution of greater quantities must be to individuals or businesses permitted to distribute the waste, or to be land applied to sites identified in the Permittee's CAWMP.

   The Permittee must inform the recipient(s) of his/her responsibilities to properly manage the land application of manure. Record keeping for the distribution of manure up to four (4) cubic yards per visit or ten (10) cubic yards per year to individuals for personal use is not required.

5. The annual permit fee shall be paid by the Permittee within thirty (30) days after being billed by the Division. Failure to pay the fee accordingly constitutes grounds for revocation of its COC to operate under this General Permit.

6. Failure of the Permittee to maintain, in full force and effect, lessee and landowner agreements, which are required in the CAWMP, shall constitute grounds for revocation of its COC to operate under this General Permit.

7. A COC to operate under this General Permit is not transferable. In the event there is a desire for the facility to change ownership, or there is a name change of the Permittee, a Notification of Change of Ownership form must be submitted to the Division, including documentation from the parties involved and other supporting materials as may be appropriate. This request shall be submitted within sixty (60) days of change of ownership. The request will be considered on its merits and may or may not be approved.

8. A COC to operate under this General Permit is effective only with respect to the nature and volume of wastes described in the application and other supporting data. The Permittee shall notify the Division immediately of any applicable information not provided in the permit application.

   Any proposed modification to an animal waste management system including the installation of lagoon covers shall require approval from the Division prior to construction.

9. If the Permittee wishes to continue an activity regulated by this General Permit after the expiration date of this General Permit, the Permittee must apply for and obtain a new COC. Renewal applications must be filed at least 180 calendar days prior to the expiration of the General Permit.

10. The issuance of a COC to operate under this General Permit does not prohibit the Division from reopening and modifying the General Permit or COC, revoking and reissuing the General Permit or COC, or terminating the General Permit or COC as allowed by the appropriate laws, rules, and regulations.

11. The Director may require any person, otherwise eligible for coverage under this General Permit, to apply for an individual permit by notifying that person that an application is required.

12. The Groundwater Compliance Boundary is established by 15A NCAC 2L .0102 and 15A NCAC 2T .0103. An exceedance of Groundwater Quality Standards at or beyond the Compliance Boundary is subject to the requirements of 15A NCAC 2L and the Division in addition to the penalty provisions applicable under the North Carolina General Statutes.

13. Upon abandonment or depopulation for a period of four years or more, the Permittee must submit documentation to the Division demonstrating that all current NRCS standards are met prior to restocking of the facility.

VI. PENALTIES

1. Failure to abide by the conditions and limitations contained in this General Permit; the facility's COC; the facility's CAWMP; and/or applicable state law; may subject the Permittee to an enforcement action by the Division including but not limited to the modification of the animal waste management system, civil penalties, criminal penalties and injunctive relief.

2. The Permittee must comply with all conditions of this General Permit. Any permit noncompliance constitutes a violation of state law and is grounds for enforcement action; for permit coverage termination, revocation and reissuance, or modification; or denial of a permit coverage renewal application.

3. It shall not be a defense for a Permittee in an enforcement action to claim that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this General Permit.

VII. DEFINITIONS

25-year, 24-hour rainfall or storm event means the maximum 24-hour precipitation event with a probable recurrence interval of once in 25 years, as defined by the National Weather Service in Technical Paper Number 40, "Rainfall Frequency Atlas of the United States," May 1961, and subsequent amendments, or equivalent regional or state rainfall probability information developed therefrom.

Agronomic rates means the amount of animal waste and/or other nutrient sources to be applied to lands as outlined in NRCS NC Conservation Practice Standards No. 590 "Nutrient Management" or as recommended by the NCDA&CS and the North Carolina Cooperative Extension Service at the time of certification of the Animal Waste Management Plan by the appropriate certified technical specialist.

Amendment to the CAWMP means a change and/or addition to a part(s) of the plan, and requires that the change and/or addition adhere to current applicable standards. The following are examples of amendments to the CAWMP:

- In an existing CAWMP, a change in crops and/or cropping pattern that utilizes 25% or less of the N generated is considered a plan amendment. Additional acreage needed to facilitate the change in crops and/or cropping pattern is permissible and considered part of the amendment.

- The addition of winter crops and/or interseeded perennial crops are considered amendments to an existing CAWMP when the operation does not require additional acreage and/or crops for N utilization, and does not exceed the 25% criteria stated above.

- When a CAWMP cannot meet N utilization requirements due to land lost to irrigation inefficiency (useable versus total acres), then the CAWMP may be amended to increase available acreage and/or change the crop for N utilization. This is the only exception to the 25% N criteria for plan revision.

- Inclusions of emergency action plans, and insect, odor and mortality checklists are considered CAWMP amendments.

- Including additional acreage for land application beyond what is required in the existing CAWMP is considered a plan amendment.

Animal feeding operation means a lot or facility (other than an aquatic animal production facility) where the following conditions are met: (i) animals (other than aquatic animals) have been, are, or will be stabled or confined and fed or maintained for a total of forty five (45) days or more in any twelve (12) month period, and (ii) crops, vegetation, forage growth, or post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility. Two or more animal feeding operations under common ownership are considered to be a single animal feeding operation if they adjoin each other, or if they use a common area or system for the disposal of wastes.

Certification means technical specialist certification of the CAWMP in accordance with the requirements of 15A NCAC 02T .1304. It is unrelated to terms "Annual Certification" as used in Condition III.14 of this General Permit, and the "No Discharge Certification Option" allowed by the November 2008 EPA CAFO Rule.

Ditch means any man made channel for the purpose of moving water off a site to the surface waters.

Excessive Ponding means any area of the application field where visible liquid waste is ponded on the surface of the land application site more than four (4) hours following the application of waste. Excessive ponding also means any areas where the ponding of waste has resulted in crop failure.

Groundwaters means any subsurface waters, as defined in 15A NCAC 2L .0102.

Land application means the application of wastewater and/or waste solids onto or incorporation into the soil.

Major changes to the CAWMP means changes in the number of animals, type of operation (feeder to finish to wean to feeder), retrofit of a lagoon, installation of a new irrigation system, and similar type changes. Recertification is only required for major changes to the CAWMP. Major changes to a facility must first be approved by the Division. The new CAWMP and the certification shall be submitted with a request that the COC be amended to reflect the changes. The facility may not make the changes until a new or amended COC has been issued.

Revision to the CAWMP means a change to an entire CAWMP to meet current applicable standards. A CAWMP must be revised if the operation cannot utilize all N nitrogen generated by the animal production in accordance with the existing CAWMP, except for the specific conditions noted in the CAWMP amendment criteria as previously defined. For an existing CAWMP, a change in crops and/or cropping pattern that utilizes more than 25% of the N generated by the operation is considered a plan revision. Any change to an existing CAWMP, whether an amendment or revision, must be signed and dated by both the producer and a technical specialist for the new CAWMP to be valid. A revision of the CAWMP does not require recertification.

State Waters means all surface waters, wetlands, groundwaters and waters of the United States located in the State.

Surface Waters means any stream, river, brook, swamp, lake, sound, tidal estuary, bay, creek, reservoir, waterway, or other surface body or surface accumulation of water, whether public or private, or natural or artificial, that is contained in, flows through, or borders upon any portion of the State of North Carolina, including any portion of the Atlantic Ocean over which the State has jurisdiction as well as any additional Waters of the United States which are located in the State.

Waste means manure, animal waste, process wastewater and/or sludge generated at an animal feeding operation.

Wetlands means areas that are inundated or saturated by an accumulation of surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions, as defined in 15A NCAC 2B .0202.

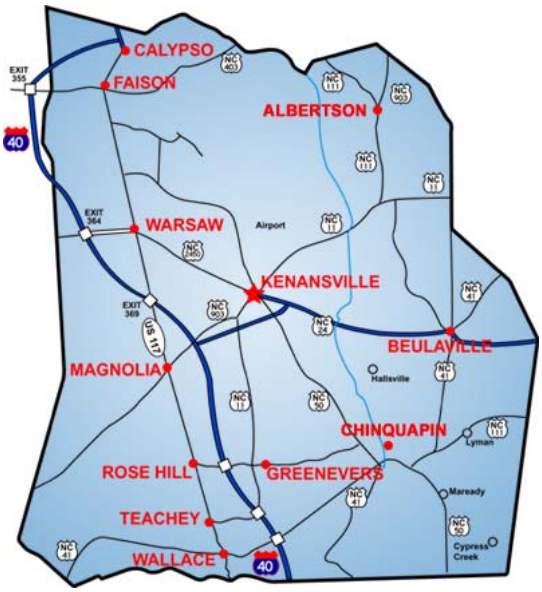
This General Permit issued the 7th day of March, 2014.

NORTH CAROLINA ENVIRONMENTAL MANAGEMENT COMMISSION

_____, Director
Thomas A. Reeder
North Carolina Division of Water Resources
By Authority of the Environmental Management Commission

Permit Number AWG100000

2014 DUPLIN COUNTY SOTCH REPORT



Reported
March 2015

State of the County Health Report

The State of the County Health Report provides a review of the current county health statistics and compares them to the health priorities that were developed as part of the 2012 Community Health Assessment. The data from the NC State Center for Health Statistics was the primary source of data. The report was prepared by Elizabeth Ricci, BSN, RN, Director of Nursing, Duplin County Health Department 340 Seminary Street Kenansville, NC 28349 email bethr@duplincountync.com and phone 910-296-2130.

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DUPLIN COUNTY DEMOGRAPHIC DATA 2014

Socioeconomic Indicators	*Duplin Co. 2014*	*North Carolina*
Total population estimate	60,084	9,943,964
Natural increase –births over deaths	2013 3.7%	2013 3.6%
Median family income	2009-2013 $34,433	2009-2013 $46,334
Unemployment rate	2014 6.0%	2014 5.5%
Persons living below the federal poverty level	2009-2013 26.3%	2009-2013 17.5%
Children living in poverty	33%	26%
Adult Obesity	36%	29%
Residents with no health insurance	27%	19%
Number of primary care offices per 100,000 population	1: 3969	1:1462
High School graduation rate	2013-2014 78.1%	2013-2014 83.9%

Source: US Census Bureau Quick Facts/ NC SCHS

Duplin County's population is slowly growing with the percent change at 3.7%, the state percent change is 3.6%. The poverty indicators have not changed significantly and all are higher that the state rates. One of the economic indicators, median family income has increased, but is still way below the state rate. The unemployment rate, number of people living below the federal poverty level, and uninsured rate is an indicator of the economic hardships facing county residents. These factors are linked to the number of residents without access to health care, have chronic disease, are obese and have poor

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health outcomes. The Medicaid expansion was rejected by the NC Legislature as option for North Carolina residents 2013. The roll out of the Affordable Care Act has seen several problems and the plans have been difficult for the public to access. The county's uninsured rates have not shown any real decrease as compared to 2013. The 2013 number of medical providers per 100,000 population was 1:3645 and current numbers show an unfavorable trend of 1:3969.

Academic achievement and education are strongly linked to health outcomes. In general, children with less education have more chronic health problems and shorter life expectancies. The data for school performance was collected from NC Public Schools.org. The end of grade (EOG) performance levels for the Duplin School District 2013-2014 year did not show any improvement. The district EOG for grade level proficiency was 47.8 and the NC rate was 60.6. College and Career readiness scores for Duplin 32.5 and NC 48. The county high school graduation rate for the five year period 2009-2013, was less than the previous 5 year period and stays below the NC rate. The current 2013-2014 graduation rate was less than the previous year. The Duplin County School Board continues to address these scores and the challenges in transitioning to the new core standards. The Duplin Early College program at James Sprunt Community College continues to have the highest graduation rates for the district. While the goal in the past for students was to perform at grade-level or better, the new goal is for students to reach grade level as well as career and college readiness.

Duplin County 2012-2013 Population

Population Demographics	*2012*	*2013*
White	52.4%	53%
Black	26.0%	25%
Native American	1.4%	1.4%
Latino origin	21.2%	21%
Persons under 18 years	25.4%	25%
Persons 65 years and over	14.9%	15.4%
Births to county residents	746	747

The county's population distribution by age, race and ethnicity has remained relatively stable. Out of the 747 live births in 2013; 39% were White; 22% were Black and 38% were Latino. These percentages when compared to last year show that the number of births to Latino women continue to be equal to the number of white births.

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2012 CHA Health Priorities

The 2012 Community Health Assessment process identified four health indicators that stood out for Duplin County. These were health indicators that exceeded the State rates and/or were cited as "perceived" health problems in the community in the community health opinion survey. The "perceived" health problems cited from the community survey were supported by secondary data. The 2012 priority issues were reviewed and evaluated for progress, trends and outcomes and new or emerging issues are noted. The Duplin County Health Department, CHA Advisory group and community developed health priorities by using secondary state data, reviewing previous health trends, and the community health opinion survey. Currently, no significant changes have been reported to require reprioritization.

1. Promote Healthy Weights through Healthy Living-Reducing Obesity
2. Promote Prevention of Chronic Disease and Improve Outcomes
3. Improve Women's Health during the Childbearing Years
4. Connect County residents with a Primary Care Medical Home-Access to Care

Emerging Issues

Issues effecting the first priority are the obesity rates. Obesity-related conditions include heart disease, stroke, type 2 diabetes and certain types of cancer. All these conditions are among of the leading causes of preventable death. The rates of adult and childhood obesity in Duplin County have not significantly improved. The data from the NC-PASS which covers children seen in WIC shows that children age 2-4 years continue to be overweight and obese though the numbers are showing an improvement both locally and state wide. This trend will need to be monitored to evaluate the sustainability and ultimate impact on overall health. The county numbers are a relatively small sample and may not be significant statistically. The table below compares the most current available data from NC- NPASS.

Duplin County Prevalence of Obesity, Overweigh Children 2 through 4 years of Age

	Overweight > = 85% to < 95th percentile	North Carolina	Obese >= 95th percentile	North Carolina
2011	19.1%	16.2%	21.4%	15.7%

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2012	↓ 14.8%	↓ 14.8%	↓ 15.7%	↓ 14.7%

Chronic Disease

The North Carolina State Center for Health Statistics (NC-SCHS) annual county level data book looks at the major morbidity and mortality data for the county. A review of the five year trend data from 2009-2013 indicates an increasing trend in deaths from diseases of the heart and from cancers. Deaths linked with diabetes are nephritis, cerebrovascular, pneumonia and influenza and all have increased. Looking at the five year trends, all causes of death have increased except motor vehicle injuries and septicemia which have decreased. Alzheimer's disease was on the 2013 top ten list but now has dropped from the current trend data. The percent of the population that is 65 years and older will continue to climb steadily as the population ages and the incidence of chronic disease will rise. The focus on the prevention of disease and the better control of early stages of chronic disease will ultimately improve outcomes.

Five Year 2008-2012 Ten Leading Causes of Death

Rank	*Leading Causes of Death*	*2008-2012*	*2009-2013*	*Change*
	All ages	*Death rate*	*Death rate*	
1	Diseases of the Heart	189.5	192.8	↑
2	Cancer-all sites	178.5	186.7	↑
3	Chronic lower respiratory	49.9	50.4	↑
4	Cerebrovascular	47.5	49.0	↑
5	Diabetes	27.4	28.4	↑
6	Motor vehicle injuries	27.4	25	↓
7	Other unintentional injuries	24.3	24.7	↑
8	Nephritis, nephrotic syndrome	22.4	24.7	↑
9	Pneumonia & Influenza	Not in top 10	19.3	
10	Septicemia	17.4	17.3	↓

Women's and Children's Health

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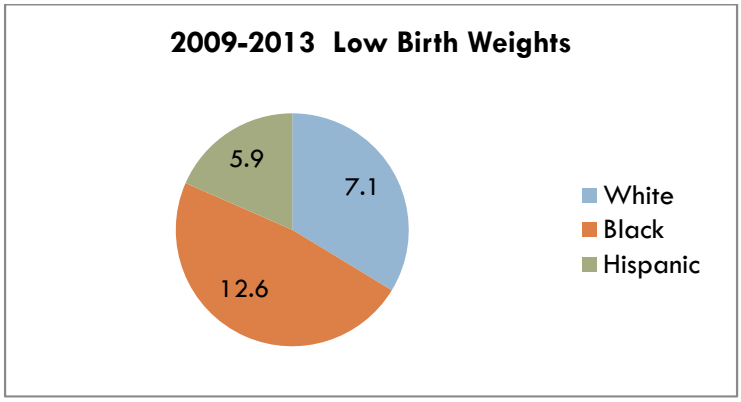
The leading causes of death for the five year period 2009-2013 for the birth to 19 year olds has changed very little. Motor vehicle injuries and conditions in the perinatal period are still number one and two. Looking at the child deaths in 2013 there were 9 child deaths between birth and17 years of age. Six of those deaths were under one years of age. The Child Fatality Prevention Team reviews child deaths and has reviewed several deaths that were attributed to SIDS and infant suffocation due to sleeping with an adult. The team has adopted a crib distribution and safe sleep education initiative for 2015.

Leading Causes of Death: Birth to 19 years of Age

	Cause of Death	2009-2013 Death rate	2013 Deaths
1	Motor Vehicle Injuries	19.6	12
2	Conditions originating in the perinatal period	18.4	15
3	Other Unintentional Injuries	9.8	0

The low birth weight data for 2013 shows that Duplin had a rate of 9.1 for all races as compared to the rate of 9.4 for NC. The ethnic breakdown data shows the African American low birth weights are higher than both White and Latino. Although Duplin County is below the state rates the disparity in the minority population continues.

Five Year Low Birth weights (less than 2500 grams) By Ethnicity



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The 2013 pregnancy rate for Duplin County teens ages 15-19 was 38.7 compared to State rate of 35.2. Repeat pregnancies represented 27% for the county compared to 24.3% for the State. Out of one hundred counties, Duplin County ranked 40th highest in the State for teen pregnancies for ages 15-19. Pregnancy rates were higher among Hispanics (57.9%) and African-Americans (42.6%) than whites (24.7%). Although the county's total pregnancy rate has decreased, the overall county pregnancy rate continues to exceed the state's rates for the past few years. The social and economic cost of teen pregnancy and birth often has a long-term impact on teen girls, their babies and the community. Reducing teen pregnancy will improve the health, education and social well-being of young women and benefit the social and economic costs for local communities. Duplin County Health Department offers comprehensive education, including information about abstinence, contraceptives and disease prevention. Case management is provided for Medicaid eligible pregnant woman and for at-risk children birth through 5 years of age through the Community Care Network (CCNC) OB and Care Coordination for Children staff. The Duplin County Partnership for Children Smart Start, has added an additional case worker to their Parent as Teachers program to address teen parents and their need for services. Data source is the appcnc.org.

Access to Care

Research shows that people living in rural areas are less likely to access health services, are likely to engage in risky behaviors and have a higher mortality rate then urban areas. Duplin County is a large, rural county with many of the same barriers experienced by other rural areas. Approximately 20% of the population is non-English speaking and have less than a high school education. The literacy level of the clients who use services at the Health Department is at or below a 6th grade reading level. The persistent health disparities and accessing health care services continues to have a major impact on the vulnerable residents of Duplin County. Duplin County residents continue to have a challenge with transportation, language disparities and overall health literacy. Although budgetary constraints and depleting resources offer challenges for the county, through collaborative efforts with partners and local agencies the county continues to adapt and provide a quality service to the community.

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Progress Made on Health Priorities in 2014

Local Priority	Progress
Health Priority #1 Promote Healthy Weights through Healthy Living- Reducing Obesity	Peer Breastfeeding counselor had an average caseload of 70 pregnant and breastfeeding women. Pediatric Healthy Weight Clinic held 24 clinics in 2014 serving 34 new clients and 48 returnees. Continuation of the grant through the Vidant Duplin Hospital Community Foundation enables this service to be provided to all patients at no cost. Health educator continues to e-mail newsletter and healthy eating tips to 500+ county employees on a weekly basis. Weight Watchers classes for the community at the Health Department once a week. Town of Wallace completed low income apartment complex with green space, playground and walking trail.
Health Priority #2 Promote prevention of chronic disease and improve outcomes	Case management of 170 diabetic patients by the Health Department. Continue to receive funding from Vidant Duplin Hospital Foundation for case management. Community diabetic education classes and medical nutrition therapy appointments at no cost pare provided by the Health Department. Monthly Community smoking cessation classes offered to the community at Health Department by health educator Increased participation in the county employee wellness initiative and gym. Several

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	exercise classes offered by health educator during the lunch hour and after 5pm.
Health Priroity #3 Improve women's health during the childbearing years	Addition of two new OB/GYN providers to Vidant Duplin Hospital. Practitioners participate in a weekly prenatal clinic at the Health Department. CFPT to start initiative on safe sleep with education on safe sleep environments and crib distribution to at risk families. Community Care Network (CCNC) case managers continue outreach to vulnerable children and their families to educate and connect them to a medical home, to decrease use of the local emergency room for non-emergency. They provide education and follow-up to both Medicaid and Non-Medicaid eligible pregnant women to assist with early entry into care and improve birth outcomes. Duplin County's Partnership for Children's Parents as Teachers program has added an additional case manager to work with young pregnant women and their families.
Health Priority #4 Connect County residents with a primary care medical home- access to care	Vidant Duplin Hospital continues to actively recruit physicians and other health care practitioners. The hospital has added specialists in orthopedics and general surgery. Vidant Duplin Hospital and Duplin County Health Department have implemented Health Net, a case management program for the uninsured population. Addition of a physician assistant, at the Health Department to expand the capacity to serve more patients.

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New Initiatives

Electronic Medical Records:

Duplin County Health Department implemented an electronic medical record (EMR) in March 2104. Over the past 10 months the EMR has been valuable in improving communicating with patients and providers. The systems has improved the prescribing of medication and tracking of prescription use by the pharmacy.

Health Net:

Medicaid expansion was not approved by the state legislators in 2013. The roll out of the Affordable Care Act has seen problems and has been difficult for the public to access. The addition of a Health Net case manager for the county's uninsured population is an initiative to address this issue. The program coordinator assists patients in accessing available insurance plans and the Affordable Care Act, participate in the prescription assistance program to receive free or low cost mediations and gain access to needed referral services.

Work-Place Wellness:

To maintain a healthy workforce and to reduce health care costs, the Health Department manages the county employee wellness program. The program includes offering employee and their dependents primary care, physicals, employee pharmacy, gym and wellness program. There is a monetary incentive program for employee who have the recommend age appropriate screenings, demonstrate healthy lifestyles and make the commit to improve their over health. The employee wellness program is designed to improve the health of the employees, increase access to physical exercise and to reduce the cost paid out-of-pocket by employees for medical care.

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State of North Carolina
Department of Environmental Quality
Division of Water Resources

Animal Feeding Operations Permit Application Form

(THIS FORM MAY BE PHOTOCOPIED FOR USE AS AN ORIGINAL)

State General Permit - Existing Animal Waste Operations

1. GENERAL INFORMATION:

1.1 Facility name: _____

1.2 Print Land Owner's name: _____

1.3 Mailing address: _____

City, State: _____ Zip: _____

Telephone number (include area code): (_____) _____ - _____

1.4 Physical address: _____

City, State: _____ Zip: _____

Telephone number (include area code): (_____) _____ - _____

1.5 County where facility is located: _____

1.6 Facility location (directions from nearest major highway, using SR numbers for state roads): _____

1.7 Farm Manager's name (if different from Land Owner): _____

1.8 Lessee's / Integrator's name (if applicable; circle which type is listed): _____

1.9 Facility's original start-up date: _____ Date(s) of facility expansion(s) (if applicable): _____

2. OPERATION INFORMATION:

2.1 Facility number: _____

2.2 Operation Description:

Please enter the Design Capacity of the system. The "No. of Animals" should be the maximum number for which the waste management structures were designed.

Type of Swine	No. of Animals	Type of Poultry	No. of Animals	Type of Cattle	No. of Animals
☐ Wean to Feeder	_____	☐ Layer	_____	☐ Beef Brood Cow	_____
☐ Feeder to Finish	_____	☐ Non-Layer	_____	☐ Beef Feeder	_____
☐ Farrow to Wean (# sow)	_____	☐ Turkey	_____	☐ Beef Stocker Calf	_____
☐ Farrow to Feeder (# sow)	_____	☐ Turkey Poults	_____	☐ Dairy Calf	_____
☐ Farrow to Finish (# sow)	_____			☐ Dairy Heifer	_____
☐ Wean to Finish (# sow)	_____			☐ Dry Cow	_____
☐ Gilts	_____			☐ Milk Cow	_____
☐ Boar/Stud	_____				

☐ Other Type of Livestock on the farm: _____ No. of Animals: _____

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2.3 Acreage cleared and available for application (excluding all required buffers and areas not covered by the application system): _____ Required Acreage (as listed in the CAWMP): _____

2.4 Number of lagoons: _____ Total Capacity (cubic feet): _____ Required Capacity (cubic feet): _____

Number of Storage Ponds: _____ Total Capacity (cubic feet): _____ Required Capacity (cubic feet): _____

2.5 Are subsurface drains present within 100' of any of the application fields? **YES** or **NO** (circle one)

2.6 Are subsurface drains present in the vicinity or under the waste management system? **YES** or **NO** (circle one)

2.7 Does this facility meet all applicable siting requirements? **YES** or **NO** (circle one)

3. REQUIRED ITEMS CHECKLIST:

Please indicate that you have included the following required items by signing your initials in the space provided next to each item.

	Applicants Initials
3.1 One completed and signed original and two copies of the application for State General Permit - Animal Waste Operations;	_____
3.2 Three copies of a general location map indicating the location of the animal waste facilities and field locations where animal waste is land applied and a county road map with the location of the facility indicated;	_____
3.3 Three copies of the entire Certified Animal Waste Management Plan (CAWMP). If the facility does not have a CAWMP, it must be completed prior to submittal of a permit application for animal waste operations.	_____

The CAWMP **must** include the following components. *Some of these components may not have been required at the time the facility was certified but should be added to the CAWMP for permitting purposes*:

3.3.1 The Waste Utilization Plan (WUP) must include the amount of Plant Available Nitrogen (PAN) produced and utilized by the facility
3.3.2 The method by which waste is applied to the disposal fields (e.g. irrigation, injection, etc.)
3.3.3 A map of every field used for land application
3.3.4 The soil series present on every land application field
3.3.5 The crops grown on every land application field
3.3.6 The Realistic Yield Expectation (RYE) for every crop shown in the WUP
3.3.7 The PAN applied to every land application field
3.3.8 The waste application windows for every crop utilized in the WUP
3.3.9 The required NRCS Standard specifications
3.3.10 A site schematic
3.3.11 Emergency Action Plan
3.3.12 Insect Control Checklist with chosen best management practices noted
3.3.13 Odor Control Checklist with chosen best management practices noted
3.3.14 Mortality Control Checklist with the selected method noted
3.3.15 Lagoon/storage pond capacity documentation (design, calculations, etc.); please be sure to include any site evaluations, wetland determinations, or hazard classifications that may be applicable to your facility
3.3.16 Operation and Maintenance Plan

If your CAWMP includes any components not shown on this list, please include the additional components with your submittal. (Composting, waste transfers, etc.)

4. APPLICANT'S CERTIFICATION:

I, _____ (Land Owner's name listed in question 1.2), attest that

this application for _____(Facility name listed in question 1.1) has been reviewed by me and is accurate and complete to the best of my knowledge. I understand that if all required parts of this application are not completed and that if all required supporting information and attachments are not included, this application package will be returned to me as incomplete.

Signature _____ Date _____

5. MANAGER'S CERTIFICATION: (complete only if different from the Land Owner)

I, _____ (Manager's name listed in question 1.6), attest that this

application for _____ _____(Facility name listed in question 1.1) has been reviewed by me and is accurate and complete to the best of my knowledge. I understand that if all required parts of this application are not completed and that if all required supporting information and attachments are not included, this application package will be returned as incomplete.

Signature _____ Date _____

THE COMPLETED APPLICATION PACKAGE, INCLUDING ALL SUPPORTING INFORMATION AND MATERIALS, SHOULD BE SENT TO THE FOLLOWING ADDRESS:

NORTH CAROLINA DIVISION OF WATER RESOURCES
WATER QUALITY REGIONAL OPERATIONS SECTION
ANIMAL FEEDING OPERATIONS PROGRAM
1636 MAIL SERVICE CENTER
RALEIGH, NORTH CAROLINA 27699-1636
TELEPHONE NUMBER: (919) 807-6464
FAX NUMBER: (919) 807-6496

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6. SURFACE WATER CLASSIFICATION:

This form must be completed by the appropriate DWR regional office and included as a part of the project submittal information.

INSTRUCTIONS TO NC PROFESSIONALS:

The classification of the downslope surface waters (the surface waters that any overflow from the facility would flow toward) in which this animal waste management system will be operated must be determined by the appropriate DWR regional office. Therefore, you are required, **prior to submittal of the application package,** to submit this form, with items 1 through 6 completed, to the appropriate Division of Water Resources Regional Aquifer Protection Supervisor (see page 6 of 10). At a minimum, you must include an 8.5" by 11" copy of the portion of a 7.5 minute USGS Topographic Map which shows the location of this animal waste application system and the downslope surface waters in which they will be located. Identify the closest downslope surface waters on the attached map copy. **Once the regional office has completed the classification, reincorporate this completed page and the topographic map into the complete application form and submit the application package.**

6.1 Farm Name: _____

6.2 Name & complete address of engineering firm: _____

Telephone number: (_____) _____ - _____

6.3 Name of closest downslope surface waters: _____

6.4 County(ies) where the animal waste management system and surface waters are located_____

6.5 Map name and date: _____

6.6 NC Professional's Seal (If appropriate), Signature, and Date:

TO: REGIONAL WQROS SUPERVISOR

Please provide me with the classification of the watershed where this animal waste management facility will be or has been constructed or field located, as identified on the attached map segment(s):

Name of surface waters:_____

Classification (as established by the Environmental Management Commission):_____

Proposed classification, if applicable: _____

Signature of regional office personnel: _____ Date:_____

(All attachments must be signed)

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DIVISION OF WATER RESOURCES REGIONAL OFFICES (9/05)

Asheville Regional WQROS Supervisor
2090 U.S. Highway 70
Swannanoa, NC 28778
(828) 296-4500
Fax (828) 299-7043

Avery	Macon
Buncombe	Madison
Burke	McDowell
Caldwell	Mitchell
Cherokee	Polk
Clay	Rutherford
Graham	Swain
Haywood	Transylvania
Henderson	Yancey
Jackson	

Washington Regional WQROS Supervisor
943 Washington Square Mall
Washington, NC 27889
(252) 946-6481
Fax (252) 975-3716

Beaufort	Jones
Bertie	Lenoir
Camden	Martin
Chowan	Pamlico
Craven	Pasquotank
Currituck	Perquimans
Dare	Pitt
Gates	Tyrell
Greene	Washington
Hertford	Wayne
Hyde	

Raleigh Regional WQROS Supervisor
1628 Mail Service Center
Raleigh, NC 27699-1628
(919) 791-4200
Fax (919) 571-4718

Chatham	Nash
Durham	Northampton
Edgecombe	Orange
Franklin	Person
Granville	Vance
Halifax	Wake
Johnston	Warren
Lee	Wilson

Fayetteville Regional WQROS Supervisor
225 Green Street, Suite 714
Fayetteville, NC 28301-5094
(910) 486-1541
Fax (910) 486-0707

Anson	Moore
Bladen	Richmond
Cumberland	Robeson
Harnett	Sampson
Hoke	Scotland
Montgomery	

Mooresville Regional WQROS Supervisor
610 East Center Avenue
Mooresville, NC 28115
(704) 663-1699
Fax (704) 663-6040

Alexander	Lincoln
Cabarrus	Mecklenburg
Catawba	Rowan
Cleveland	Stanly
Gaston	Union
Iredell	

Wilmington Region WQROS Supervisor
127 Cardinal Drive Extension
Wilmington, NC 28405-3845
(910) 796-7215
Fax (910) 350-2004

Brunswick	New Hanover
Carteret	Onslow
Columbus	Pender
Duplin	

Winston-Salem Regional WQROS Supervisor
450 Hanes Mill Road, Suite 300
Winston-Salem, NC 27105
Phone (336) 776-9800
Fax (336) 776-9797

Alamance	Rockingham
Alleghany	Randolph
Ashe	Stokes
Caswell	Surry
Davidson	Watauga
Davie	Wilkes
Forsyth	Yadkin
Guilford	

State of North Carolina
Department of Environmental Quality
Division of Water Resources

Animal Feeding Operations Permit Application Form

(THIS FORM MAY BE PHOTOCOPIED FOR USE AS AN ORIGINAL)

State General Permit – New or Expanding Animal Waste Operations

1. GENERAL INFORMATION:

1.1 Facility name: _____

1.2 Print Land Owner's name: _____

1.3 Mailing address: _____

City, State: _____ Zip: _____

Telephone number (include area code): (_____) _____ - _____

1.4 Physical address: _____

City, State: _____ Zip: _____

Telephone number (include area code): (_____) _____ - _____

1.5 County where facility is located: _____

1.6 Facility location (directions from nearest major highway, using SR numbers for state roads): _____

1.7 Farm Manager's name (if different from Land Owner): _____

1.8 Lessee's / Integrator's name (if applicable; circle which type is listed): _____

1.9 Facility's original start-up date: _____ Date(s) of facility expansion(s) (if applicable): _____

2. OPERATION INFORMATION:

2.1 Facility number: _____

2.2 Operation Description:

Please enter the Design Capacity of the system. The "No. of Animals" should be the maximum number for which the waste management structures were designed.

Type of Swine	No. of Animals	Type of Poultry	No. of Animals	Type of Cattle	No. of Animals
☐ Wean to Feeder	_____	☐ Layer	_____	☐ Beef Brood Cow	_____
☐ Feeder to Finish	_____	☐ Non-Layer	_____	☐ Beef Feeder	_____
☐ Farrow to Wean (# sow)	_____	☐ Turkey	_____	☐ Beef Stocker Calf	_____
☐ Farrow to Feeder (# sow)	_____	☐ Turkey Poults	_____	☐ Dairy Calf	_____
☐ Farrow to Finish (# sow)	_____			☐ Dairy Heifer	_____
☐ Wean to Finish (# sow)	_____			☐ Dry Cow	_____
☐ Gilts	_____			☐ Milk Cow	_____
☐ Boar/Stud	_____				

☐ Other Type of Livestock on the farm: _____ No. of Animals: _____

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2.3 Acreage cleared and available for application (excluding all required buffers and areas not covered by the application system): _____ Required Acreage (as listed in the CAWMP): _____

2.4 Number of lagoons: _____ Total Capacity (cubic feet): _____ Required Capacity (cubic feet): _____

Number of Storage Ponds: _____ Total Capacity (cubic feet): _____ Required Capacity (cubic feet): _____

2.5 Are subsurface drains present within 100' of any of the application fields? **YES** or **NO** (circle one)

2.6 Are subsurface drains present in the vicinity or under the waste management system? **YES** or **NO** (circle one)

2.7 Does this facility meet all applicable siting requirements? **YES** or **NO** (circle one)

3. REQUIRED ITEMS CHECKLIST:

Please indicate that you have included the following required items by signing your initials in the space provided next to each item.

Applicants Initials

3.1 One completed and signed original and two copies of the application for State General Permit - Animal Waste Operations; _____

3.2 Three copies of a general location map indicating the location of the animal waste facilities and field locations where animal waste is land applied and a county road map with the location of the facility indicated; _____

3.3 Three copies of the entire Certified Animal Waste Management Plan (CAWMP). If the facility does not have a CAWMP, it must be completed prior to submittal of a permit application for animal waste operations. _____

The CAWMP **must** include the following components. *Some of these components may not have been required at the time the facility was certified but should be added to the CAWMP for permitting purposes*:

3.3.1 NRCS Site Evaluation Form NC-CPA-17 or equivalent
3.3.2 A hazard classification of the proposed lagoons, if required
3.3.3 Documentation that proposed swine facilities meet the Swine Farm Siting Act, including a site map prepared by a Registered Land Surveyor. The scale of this map shall not exceed 1 inch = 400 feet. At a minimum, the site map shall show the distance from the proposed houses and lagoons to occupied residences within 1500 feet, schools, hospitals, churches, outdoor recreational facilities, national parks, state parks, historic properties, or child care centers within 2500 feet, property boundaries within 500 feet, water supply wells within 500 feet. The map shall also show the location of any property boundaries and perennial streams or rivers located within 75 feet of waste application areas.
3.3.4 Documentation showing that all adjoining property owners, all property owners who own property located across a public road, street, or highway from the facility, the local health department, and the county manager or chair of the county board of commissioners if there is no county manager, have been notified by certified mail of your intent to construct or expand a swine farm at this location.
3.3.5 A wetlands determination
3.3.6 The lagoon/storage facility design
3.3.7 Proposed runoff control measures, if required
3.3.8 Irrigation or other land application method design
3.3.9 The Waste Utilization Plan (WUP) must include the amount of Plant Available Nitrogen (PAN) produced and utilized by the facility
3.3.10 The soil series present on every waste disposal field
3.3.11 The crops grown on every waste disposal field
3.3.12 The Realistic Yield Expectation (RYE) for every crop shown in the WUP
3.3.13 The PAN applied to every waste disposal field
3.3.14 The waste application windows for every crop utilized in the WUP
3.3.15 The required NRCS Standard specifications

3.3.16 Emergency Action Plan
3.3.17 Insect Control Checklist with options noted
3.3.18 Odor Control Checklist with options noted
3.3.19 Mortality Control Checklist with options noted
3.3.20 Documentation proving this facility is exempt from the Moritoria on Construction or Expansion of Swine Farms, if the application is for a swine facility
3.3.21 A map showing the topography of the proposed facility location showing features that affect facility design, the dimensions and elevations of any existing facilities, the fields used for waste application, and areas where surface runoff is to be controlled

If your CAWMP includes any components not shown on this list, please include the additional components with your submittal. (Composting, waste transfers, etc.)

4. APPLICANT'S CERTIFICATION:

I, _____ (Land Owner's name listed in question 1.2), attest that

this application for _____(Facility name listed in question 1.1) has been reviewed by me and is accurate and complete to the best of my knowledge. I understand that if all required parts of this application are not completed and that if all required supporting information and attachments are not included, this application package will be returned to me as incomplete.

Signature _____ Date _____

5. MANAGER'S CERTIFICATION: (complete only if different from the Land Owner)

I, _____ (Manager's name listed in question 1.6), attest that this

application for _____ _____(Facility name listed in question 1.1) has been reviewed by me and is accurate and complete to the best of my knowledge. I understand that if all required parts of this application are not completed and that if all required supporting information and attachments are not included, this application package will be returned as incomplete.

Signature _____ Date _____

THE COMPLETED APPLICATION PACKAGE, INCLUDING ALL SUPPORTING INFORMATION AND MATERIALS, SHOULD BE SENT TO THE FOLLOWING ADDRESS:

NORTH CAROLINA DIVISION OF WATER RESOURCES
WATER QUALITY REGIONAL OPERATIONS SECTION
ANIMAL FEEDING OPERATIONS PROGRAM
1636 MAIL SERVICE CENTER
RALEIGH, NORTH CAROLINA 27699-1636
TELEPHONE NUMBER: (919) 807-6464
FAX NUMBER: (919) 807-6496

6. SURFACE WATER CLASSIFICATION:

This form must be completed by the appropriate DWR regional office and included as a part of the project submittal information.

INSTRUCTIONS TO NC PROFESSIONALS:

The classification of the downslope surface waters (the surface waters that any overflow from the facility would flow toward) in which this animal waste management system will be operated must be determined by the appropriate DWR regional office. Therefore, you are required, **prior to submittal of the application package,** to submit this form, with items 1 through 6 completed, to the appropriate Division of Water Resources Regional Aquifer Protection Supervisor (see page 6 of 10). At a minimum, you must include an 8.5" by 11" copy of the portion of a 7.5 minute USGS Topographic Map which shows the location of this animal waste application system and the downslope surface waters in which they will be located. Identify the closest downslope surface waters on the attached map copy. **Once the regional office has completed the classification, reincorporate this completed page and the topographic map into the complete application form and submit the application package.**

6.1 Farm Name: _____

6.2 Name & complete address of engineering firm: _____

Telephone number: (_____) _____ - _____

6.3 Name of closest downslope surface waters: _____

6.4 County(ies) where the animal waste management system and surface waters are located_____

6.5 Map name and date: _____

6.6 NC Professional's Seal (If appropriate), Signature, and Date:

TO: REGIONAL WQROS SUPERVISOR

Please provide me with the classification of the watershed where this animal waste management facility will be or has been constructed or field located, as identified on the attached map segment(s):

Name of surface waters:_____

Classification (as established by the Environmental Management Commission):_____

Proposed classification, if applicable: _____

Signature of regional office personnel: _____ Date:_____

(All attachments must be signed)

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DIVISION OF WATER RESOURCES REGIONAL OFFICES (9/05)

Asheville Regional WQROS Supervisor
2090 U.S. Highway 70
Swannanoa, NC 28778
(828) 296-4500
Fax (828) 299-7043

Avery	Macon
Buncombe	Madison
Burke	McDowell
Caldwell	Mitchell
Cherokee	Polk
Clay	Rutherford
Graham	Swain
Haywood	Transylvania
Henderson	Yancey
Jackson	

Washington Regional WQROS Supervisor
943 Washington Square Mall
Washington, NC 27889
(252) 946-6481
Fax (252) 975-3716

Beaufort	Jones
Bertie	Lenoir
Camden	Martin
Chowan	Pamlico
Craven	Pasquotank
Currituck	Perquimans
Dare	Pitt
Gates	Tyrell
Greene	Washington
Hertford	Wayne
Hyde	

Raleigh Regional WQROS Supervisor
1628 Mail Service Center
Raleigh, NC 27699-1628
(919) 791-4200
Fax (919) 571-4718

Chatham	Nash
Durham	Northampton
Edgecombe	Orange
Franklin	Person
Granville	Vance
Halifax	Wake
Johnston	Warren
Lee	Wilson

Fayetteville Regional WQROS Supervisor
225 Green Street, Suite 714
Fayetteville, NC 28301-5094
(910) 486-1541
Fax (910) 486-0707

Anson	Moore
Bladen	Richmond
Cumberland	Robeson
Harnett	Sampson
Hoke	Scotland
Montgomery	

Mooresville Regional WQROS Supervisor
610 East Center Avenue
Mooresville, NC 28115
(704) 663-1699
Fax (704) 663-6040

Alexander	Lincoln
Cabarrus	Mecklenburg
Catawba	Rowan
Cleveland	Stanly
Gaston	Union
Iredell	

Wilmington Region WQROS Supervisor
127 Cardinal Drive Extension
Wilmington, NC 28405-3845
(910) 796-7215
Fax (910) 350-2004

Brunswick	New Hanover
Carteret	Onslow
Columbus	Pender
Duplin	

Winston-Salem Regional WQROS Supervisor
450 Hanes Mill Road, Suite 300
Winston-Salem, NC 27105
Phone (336) 776-9800
Fax (336) 776-9797

Alamance	Rockingham
Alleghany	Randolph
Ashe	Stokes
Caswell	Surry
Davidson	Watauga
Davie	Wilkes
Forsyth	Yadkin
Guilford	

State of North Carolina
Department of Environmental Quality
Division of Water Resources

Animal Feeding Operations Permit Application Form

(THIS FORM MAY BE PHOTOCOPIED FOR USE AS AN ORIGINAL)

State Individual Permit - Existing Animal Waste Operations

1. GENERAL INFORMATION:

1.1 Facility name: _____

1.2 Print Land Owner's name: _____

1.3 Mailing address: _____

City, State: _____ Zip: _____

Telephone number (include area code): (_____) _____ - _____

1.4 Physical address: _____

City, State: _____ Zip: _____

Telephone number (include area code): (_____) _____ - _____

1.5 County where facility is located: _____

1.6 Facility location (directions from nearest major highway, using SR numbers for state roads): _____

1.7 Farm Manager's name (if different from Land Owner): _____

1.8 Lessee's / Integrator's name (if applicable; circle which type is listed): _____

1.9 Facility's original start-up date: _____ Date(s) of facility expansion(s) (if applicable): _____

2. OPERATION INFORMATION:

2.1 Facility number: _____

2.2 Operation Description:

Please enter the Design Capacity of the system. The "No. of Animals" should be the maximum number for which the waste management structures were designed.

Type of Swine	No. of Animals	Type of Poultry	No. of Animals	Type of Cattle	No. of Animals
☐ Wean to Feeder	_____	☐ Layer	_____	☐ Beef Brood Cow	_____
☐ Feeder to Finish	_____	☐ Non-Layer	_____	☐ Beef Feeder	_____
☐ Farrow to Wean (# sow)	_____	☐ Turkey	_____	☐ Beef Stocker Calf	_____
☐ Farrow to Feeder (# sow)	_____	☐ Turkey Poults	_____	☐ Dairy Calf	_____
☐ Farrow to Finish (# sow)	_____			☐ Dairy Heifer	_____
☐ Wean to Finish (# sow)	_____			☐ Dry Cow	_____
☐ Gilts	_____			☐ Milk Cow	_____
☐ Boar/Stud	_____				

☐ Other Type of Livestock on the farm: _____ No. of Animals: _____

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2.3 Acreage cleared and available for application (excluding all required buffers and areas not covered by the application system): _____ Required Acreage (as listed in the CAWMP): _____

2.4 Number of lagoons: _____ Total Capacity (cubic feet): _____ Required Capacity (cubic feet): _____

Number of Storage Ponds: _____ Total Capacity (cubic feet): _____ Required Capacity (cubic feet): _____

2.5 Are subsurface drains present within 100' of any of the application fields? **YES** or **NO** (circle one)

2.6 Are subsurface drains present in the vicinity or under the waste management system? **YES** or **NO** (circle one)

2.7 Does this facility meet all applicable siting requirements? **YES** or **NO** (circle one)

2.8 Brief description of treatment process: _____

3. REQUIRED ITEMS CHECKLIST:

Please indicate that you have included the following required items by signing your initials in the space provided next to each item.

	Applicants Initials
3.1 One completed and signed original and two copies of the application for State Individual Permit - Animal Waste Operations;	_____
3.2 Three copies of a general location map indicating the location of the animal waste facilities and field locations where animal waste is land applied and a county road map with the location of the facility indicated;	_____
3.3 Three copies of the entire Certified Animal Waste Management Plan (CAWMP). If the facility does not have a CAWMP, it must be completed prior to submittal of a permit application for animal waste operations.	_____

The CAWMP **must** include the following components. *Some of these components may not have been required at the time the facility was certified but should be added to the CAWMP for permitting purposes*:

3.3.1 The Waste Utilization Plan (WUP) must include the amount of Plant Available Nitrogen (PAN) produced and utilized by the facility
3.3.2 The method by which waste is applied to the disposal fields (e.g. irrigation, injection, etc.)
3.3.3 A map of every field used for land application
3.3.4 The soil series present on every land application field
3.3.5 The crops grown on every land application field
3.3.6 The Realistic Yield Expectation (RYE) for every crop shown in the WUP
3.3.7 The PAN applied to every land application field
3.3.8 The waste application windows for every crop utilized in the WUP
3.3.9 The required NRCS Standard specifications
3.3.10 A site schematic
3.3.11 Emergency Action Plan
3.3.12 Insect Control Checklist with chosen best management practices noted
3.3.13 Odor Control Checklist with chosen best management practices noted
3.3.14 Mortality Control Checklist with the selected method noted
3.3.15 Lagoon/storage pond capacity documentation (design, calculations, etc.); please be sure to include any site evaluations, wetland determinations, or hazard classifications that may be applicable to your facility
3.3.16 Operation and Maintenance Plan

If your CAWMP includes any components not shown on this list, please include the additional components with your submittal. (Composting, waste transfers, etc.)

4. APPLICANT'S CERTIFICATION:

I, _____ (Land Owner's name listed in question 1.2), attest that

this application for _____(Facility name listed in question 1.1) has been reviewed by me and is accurate and complete to the best of my knowledge. I understand that if all required parts of this application are not completed and that if all required supporting information and attachments are not included, this application package will be returned to me as incomplete.

Signature _____ Date _____

5. MANAGER'S CERTIFICATION: (complete only if different from the Land Owner)

I, _____ (Manager's name listed in question 1.6), attest that this

application for _____ _____(Facility name listed in question 1.1) has been reviewed by me and is accurate and complete to the best of my knowledge. I understand that if all required parts of this application are not completed and that if all required supporting information and attachments are not included, this application package will be returned as incomplete.

Signature _____ Date _____

THE COMPLETED APPLICATION PACKAGE, INCLUDING ALL SUPPORTING INFORMATION AND MATERIALS, SHOULD BE SENT TO THE FOLLOWING ADDRESS:

NORTH CAROLINA DIVISION OF WATER RESOURCES
WATER QUALITY REGIONAL OPERATIONS SECTION
ANIMAL FEEDING OPERATIONS PROGRAM
1636 MAIL SERVICE CENTER
RALEIGH, NORTH CAROLINA 27699-1636
TELEPHONE NUMBER: (919) 733-3221
FAX NUMBER: (919) 715-6048

EPA-HQ-2017-00797 E-Files 000357 Wk of 2019-07-29

6. SURFACE WATER CLASSIFICATION:

This form must be completed by the appropriate DWR regional office and included as a part of the project submittal information.

INSTRUCTIONS TO NC PROFESSIONALS:

The classification of the downslope surface waters (the surface waters that any overflow from the facility would flow toward) in which this animal waste management system will be operated must be determined by the appropriate DWR regional office. Therefore, you are required, **prior to submittal of the application package,** to submit this form, with items 1 through 6 completed, to the appropriate Division of Water Resources, Water Quality Regional Operations Supervisor (see page 6 of 10). At a minimum, you must include an 8.5" by 11" copy of the portion of a 7.5 minute USGS Topographic Map which shows the location of this animal waste application system and the downslope surface waters in which they will be located. Identify the closest downslope surface waters on the attached map copy. **Once the regional office has completed the classification, reincorporate this completed page and the topographic map into the complete application form and submit the application package.**

6.1 Farm Name: _____

6.2 Name & complete address of engineering firm: _____

Telephone number: (_____) _____ - _____

6.3 Name of closest downslope surface waters: _____

6.4 County(ies) where the animal waste management system and surface waters are located_____

6.5 Map name and date: _____

6.6 NC Professional's Seal (If appropriate), Signature, and Date:

TO: WQROS SUPERVISOR

Please provide me with the classification of the watershed where this animal waste management facility will be or has been constructed or field located, as identified on the attached map segment(s):

Name of surface waters:_____

Classification (as established by the Environmental Management Commission):_____

Proposed classification, if applicable: _____

Signature of regional office personnel: _____ Date:_____

(All attachments must be signed)

EPA-HQ-2017-00797 E-Files 000358 Wk of 2019-07-29

DIVISION OF WATER RESOURCES REGIONAL OFFICES (9/05)

Asheville Regional WQROS Supervisor
2090 U.S. Highway 70
Swannanoa, NC 28778
(828) 296-4500
Fax (828) 299-7043

Avery
Buncombe
Burke
Caldwell
Cherokee
Clay
Graham
Haywood
Henderson
Jackson
Macon
Madison
McDowell
Mitchell
Polk
Rutherford
Swain
Transylvania
Yancey

Washington Regional WQROS Supervisor
943 Washington Square Mall
Washington, NC 27889
(252) 946-6481
Fax (252) 975-3716

Beaufort
Bertie
Camden
Chowan
Craven
Currituck
Dare
Gates
Greene
Hertford
Hyde
Jones
Lenoir
Martin
Pamlico
Pasquotank
Perquimans
Pitt
Tyrell
Washington
Wayne

Raleigh Regional WQROS Supervisor
1628 Mail Service Center
Raleigh, NC 27699-1628
(919) 791-4200
Fax (919) 571-4718

Chatham
Durham
Edgecombe
Franklin
Granville
Halifax
Johnston
Lee
Nash
Northampton
Orange
Person
Vance
Wake
Warren
Wilson

Fayetteville Regional WQROS Supervisor
225 Green Street, Suite 714
Fayetteville, NC 28301-5094
(910) 486-1541
Fax (910) 486-0707

Anson
Bladen
Cumberland
Harnett
Hoke
Montgomery
Moore
Richmond
Robeson
Sampson
Scotland

Mooresville Regional WQROS Supervisor
610 East Center Avenue
Mooresville, NC 28115
(704) 663-1699
Fax (704) 663-6040

Alexander
Cabarrus
Catawba
Cleveland
Gaston
Iredell
Lincoln
Mecklenburg
Rowan
Stanly
Union

Wilmington Region WQROS Supervisor
127 Cardinal Drive Extension
Wilmington, NC 28405-3845
(910) 796-7215
Fax (910) 350-2004

Brunswick
Carteret
Columbus
Duplin
New Hanover
Onslow
Pender

Winston-Salem Regional WQROS Supervisor
450 Hanes Mill Road, Suite 300
Winston-Salem, NC 27105
Phone (336) 776-9800
Fax (336) 776-9797

Alamance
Alleghany
Ashe
Caswell
Davidson
Davie
Forsyth
Guilford
Rockingham
Randolph
Stokes
Surry
Watauga
Wilkes
Yadkin

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State of North Carolina
Department of Environmental Quality
Division of Water Resources

Animal Feeding Operations Permit Application Form

(THIS FORM MAY BE PHOTOCOPIED FOR USE AS AN ORIGINAL)

State Individual Permit – New or Expanding Animal Waste Operations

1. GENERAL INFORMATION:

1.1 Facility name: _____

1.2 Print Land Owner's name: _____

1.3 Mailing address: _____

City, State: _____ Zip: _____

Telephone number (include area code): (_____) _____ - _____

1.4 Physical address: _____

City, State: _____ Zip: _____

Telephone number (include area code): (_____) _____ - _____

1.5 County where facility is located: _____

1.6 Facility location (directions from nearest major highway, using SR numbers for state roads): _____

1.7 Farm Manager's name (if different from Land Owner): _____

1.8 Lessee's / Integrator's name (if applicable; circle which type is listed): _____

1.9 Facility's original start-up date: _____ Date(s) of facility expansion(s) (if applicable): _____

2. OPERATION INFORMATION:

2.1 Facility number: _____

2.2 Operation Description:

Please enter the Design Capacity of the system. The "No. of Animals" should be the maximum number for which the waste management structures were designed.

Type of Swine	No. of Animals	Type of Poultry	No. of Animals	Type of Cattle	No. of Animals
☐ Wean to Feeder	_____	☐ Layer	_____	☐ Beef Brood Cow	_____
☐ Feeder to Finish	_____	☐ Non-Layer	_____	☐ Beef Feeder	_____
☐ Farrow to Wean (# sow)	_____	☐ Turkey	_____	☐ Beef Stocker Calf	_____
☐ Farrow to Feeder (# sow)	_____	☐ Turkey Poults	_____	☐ Dairy Calf	_____
☐ Farrow to Finish (# sow)	_____			☐ Dairy Heifer	_____
☐ Wean to Finish (# sow)	_____			☐ Dry Cow	_____
☐ Gilts	_____			☐ Milk Cow	_____
☐ Boar/Stud	_____				

☐ Other Type of Livestock on the farm: _____ No. of Animals: _____

EPA-HQ-2017-00797 E-Files 000360 Wk of 2019-07-29

2.3 Acreage cleared and available for application (excluding all required buffers and areas not covered by the application system): _____ Required Acreage (as listed in the CAWMP): _____

2.4 Number of lagoons: _____ Total Capacity (cubic feet): _____ Required Capacity (cubic feet): _____

Number of Storage Ponds: _____ Total Capacity (cubic feet): _____ Required Capacity (cubic feet): _____

2.5 Are subsurface drains present within 100' of any of the application fields? **YES** or **NO** (circle one)

2.6 Are subsurface drains present in the vicinity or under the waste management system? **YES** or **NO** (circle one)

2.7 Does this facility meet all applicable siting requirements? **YES** or **NO** (circle one)

2.8 Brief description of treatment process: _____

3. REQUIRED ITEMS CHECKLIST:

Please indicate that you have included the following required items by signing your initials in the space provided next to each item.

	Applicants Initials
3.1 One completed and signed original and two copies of the application for State Individual Permit - Animal Waste Operations;	_____
3.2 Three copies of a general location map indicating the location of the animal waste facilities and field locations where animal waste is land applied and a county road map with the location of the facility indicated;	_____
3.3 Three copies of the entire Certified Animal Waste Management Plan (CAWMP). If the facility does not have a CAWMP, it must be completed prior to submittal of a permit application for animal waste operations.	_____

The CAWMP **must** include the following components. *Some of these components may not have been required at the time the facility was certified but should be added to the CAWMP for permitting purposes*:

3.3.1 NRCS Site Evaluation Form NC-CPA-17 or equivalent
3.3.2 A hazard classification of the proposed lagoons, if required
3.3.3 Documentation that proposed swine facilities meet the Swine Farm Siting Act, including a site map prepared by a Registered Land Surveyor. The scale of this map shall not exceed 1 inch = 400 feet. At a minimum, the site map shall show the distance from the proposed houses and lagoons to occupied residences within 1500 feet, schools, hospitals, churches, outdoor recreational facilities, national parks, state parks, historic properties, or child care centers within 2500 feet, property boundaries within 500 feet, water supply wells within 500 feet. The map shall also show the location of any property boundaries and perennial streams or rivers located within 75 feet of waste application areas.
3.3.4 Documentation showing that all adjoining property owners, all property owners who own property located across a public road, street, or highway from the facility, the local health department, and the county manager or chair of the county board of commissioners if there is no county manager, have been notified by certified mail of your intent to construct or expand a swine farm at this location.
3.3.5 A wetlands determination
3.3.6 The lagoon/storage facility design
3.3.7 Proposed runoff control measures, if required
3.3.8 Irrigation or other land application method design
3.3.9 The Waste Utilization Plan (WUP) must include the amount of Plant Available Nitrogen (PAN) produced and utilized by the facility
3.3.10 The soil series present on every waste disposal field
3.3.11 The crops grown on every waste disposal field
3.3.12 The Realistic Yield Expectation (RYE) for every crop shown in the WUP
3.3.13 The PAN applied to every waste disposal field

3.3.14 The waste application windows for every crop utilized in the WUP
3.3.15 The required NRCS Standard specifications
3.3.16 Emergency Action Plan
3.3.17 Insect Control Checklist with options noted
3.3.18 Odor Control Checklist with options noted
3.3.19 Mortality Control Checklist with options noted
3.3.20 Documentation proving this facility is exempt from the Moritoria on Construction or Expansion of Swine Farms, if the application is for a swine facility
3.3.21 A map showing the topography of the proposed facility location showing features that affect facility design, the dimensions and elevations of any existing facilities, the fields used for waste application, and areas where surface runoff is to be controlled

If your CAWMP includes any components not shown on this list, please include the additional components with your submittal. (Composting, waste transfers, etc.)

4. APPLICANT'S CERTIFICATION:

I, _____ (Land Owner's name listed in question 1.2), attest that

this application for _____(Facility name listed in question 1.1) has been reviewed by me and is accurate and complete to the best of my knowledge. I understand that if all required parts of this application are not completed and that if all required supporting information and attachments are not included, this application package will be returned to me as incomplete.

Signature _____ Date _____

5. MANAGER'S CERTIFICATION: (complete only if different from the Land Owner)

I, _____ (Manager's name listed in question 1.6), attest that this

application for _____ _____(Facility name listed in question 1.1) has been reviewed by me and is accurate and complete to the best of my knowledge. I understand that if all required parts of this application are not completed and that if all required supporting information and attachments are not included, this application package will be returned as incomplete.

Signature _____ Date _____

THE COMPLETED APPLICATION PACKAGE, INCLUDING ALL SUPPORTING INFORMATION AND MATERIALS, SHOULD BE SENT TO THE FOLLOWING ADDRESS:

NORTH CAROLINA DIVISION OF WATER RESOURCES
WATER QUALITY REGIONAL OPERATIONS SECTION
ANIMAL FEEDING OPERATIONS PROGRAM
1636 MAIL SERVICE CENTER
RALEIGH, NORTH CAROLINA 27699-1636
TELEPHONE NUMBER: (919) 807-6464
FAX NUMBER: (919) 807-6496

6. SURFACE WATER CLASSIFICATION:

This form must be completed by the appropriate DWR regional office and included as a part of the project submittal information.

INSTRUCTIONS TO NC PROFESSIONALS:

The classification of the downslope surface waters (the surface waters that any overflow from the facility would flow toward) in which this animal waste management system will be operated must be determined by the appropriate DWR regional office. Therefore, you are required, **prior to submittal of the application package,** to submit this form, with items 1 through 6 completed, to the appropriate Division of Water Resources Regional Aquifer Protection Supervisor (see page 6 of 10). At a minimum, you must include an 8.5" by 11" copy of the portion of a 7.5 minute USGS Topographic Map which shows the location of this animal waste application system and the downslope surface waters in which they will be located. Identify the closest downslope surface waters on the attached map copy. **Once the regional office has completed the classification, reincorporate this completed page and the topographic map into the complete application form and submit the application package.**

6.1 Farm Name: _____

6.2 Name & complete address of engineering firm: _____

Telephone number: (_____) _____

6.3 Name of closest downslope surface waters: _____

6.4 County(ies) where the animal waste management system and surface waters are located_____

6.5 Map name and date: _____

6.6 NC Professional's Seal (If appropriate), Signature, and Date:

TO: REGIONAL AQUIFER PROTECTION SUPERVISOR

Please provide me with the classification of the watershed where this animal waste management facility will be or has been constructed or field located, as identified on the attached map segment(s):

Name of surface waters:_____

Classification (as established by the Environmental Management Commission):_____

Proposed classification, if applicable: _____

Signature of regional office personnel: _____ Date:_____

(All attachments must be signed)

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DIVISION OF WATER RESOURCES REGIONAL OFFICES (9/05)

Asheville Regional WQROS Supervisor
2090 U.S. Highway 70
Swannanoa, NC 28778
(828) 296-4500
Fax (828) 299-7043

Avery	Macon
Buncombe	Madison
Burke	McDowell
Caldwell	Mitchell
Cherokee	Polk
Clay	Rutherford
Graham	Swain
Haywood	Transylvania
Henderson	Yancey
Jackson	

Washington Regional WQROS Supervisor
943 Washington Square Mall
Washington, NC 27889
(252) 946-6481
Fax (252) 975-3716

Beaufort	Jones
Bertie	Lenoir
Camden	Martin
Chowan	Pamlico
Craven	Pasquotank
Currituck	Perquimans
Dare	Pitt
Gates	Tyrell
Greene	Washington
Hertford	Wayne
Hyde	

Raleigh Regional WQROS Supervisor
1628 Mail Service Center
Raleigh, NC 27699-1628
(919) 791-4200
Fax (919) 571-4718

Chatham	Nash
Durham	Northampton
Edgecombe	Orange
Franklin	Person
Granville	Vance
Halifax	Wake
Johnston	Warren
Lee	Wilson

Fayetteville Regional WQROS Supervisor
225 Green Street, Suite 714
Fayetteville, NC 28301-5094
(910) 486-1541
Fax (910) 486-0707

Anson	Moore
Bladen	Richmond
Cumberland	Robeson
Harnett	Sampson
Hoke	Scotland
Montgomery	

Mooresville Regional WQROS Supervisor
610 East Center Avenue
Mooresville, NC 28115
(704) 663-1699
Fax (704) 663-6040

Alexander	Lincoln
Cabarrus	Mecklenburg
Catawba	Rowan
Cleveland	Stanly
Gaston	Union
Iredell	

Wilmington Region WQROS Supervisor
127 Cardinal Drive Extension
Wilmington, NC 28405-3845
(910) 796-7215
Fax (910) 350-2004

Brunswick	New Hanover
Carteret	Onslow
Columbus	Pender
Duplin	

Winston-Salem Regional WQROS Supervisor
450 Hanes Mill Road, Suite 300
Winston-Salem, NC 27105
Phone (336) 776-9800
Fax (336) 776-9797

Alamance	Rockingham
Alleghany	Randolph
Ashe	Stokes
Caswell	Surry
Davidson	Watauga
Davie	Wilkes
Forsyth	Yadkin
Guilford	

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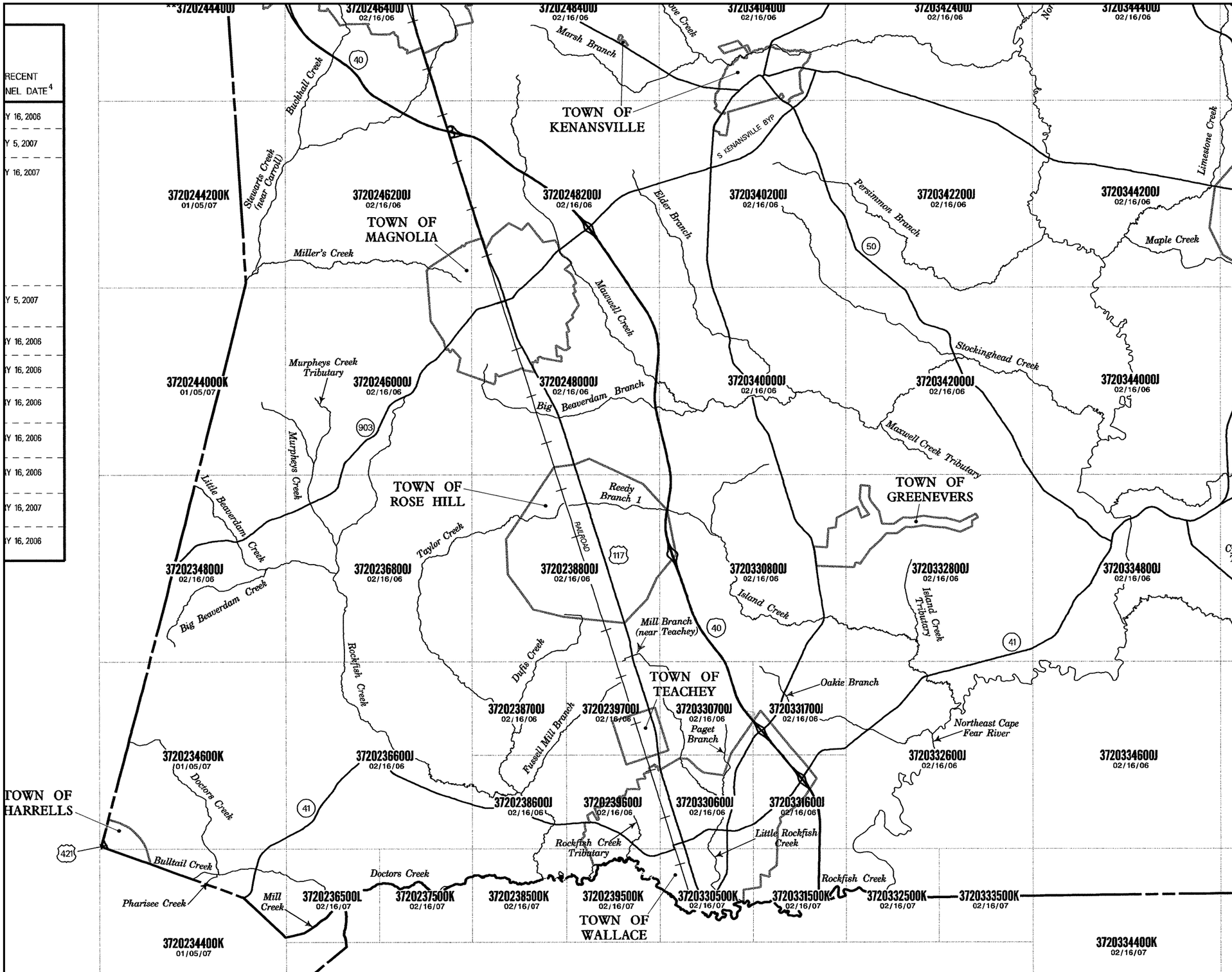
RECENT NEL DATE[4]
Y 16, 2006
Y 5, 2007
Y 16, 2007
Y 5, 2007
Y 16, 2006
Y 16, 2006
Y 16, 2006
Y 16, 2006
Y 16, 2006
Y 16, 2007
Y 16, 2006



FIRM
FLOOD INSURANCE RATE MAP

DUPLIN COUNTY,
NORTH CAROLINA
AND INCORPORATED AREAS

(SEE LISTING OF COMMUNITIES TABLE)

MAP INDEX

PANEL PRINTED: 2344, 2346, 2348, 2365, 2366, 2368, 2375, 2385, 2386, 2387, 2388, 2395, 2396, 2397, 2440, 2442, 2446, 2448, 2460, 2462, 2464, 2466, 2468, 2480, 2482, 2484, 2486, 2488, 2540, 2542, 2552, 2560, 2580, 2582, 2592, 3305, 3306, 3307, 3308, 3315, 3316, 3317, 3325, 3326, 3328, 3335, 3344, 3346, 3348, 3364, 3366, 3368, 3386, 3388, 3400, 3402, 3404, 3406, 3408, 3420, 3422, 3424, 3426, 3428, 3440, 3442, 3444, 3446, 3448, 3460, 3462, 3464, 3466, 3468, 3480, 3482, 3484, 3501, 3502, 3510, 3511, 3520, 3521, 3530, 3531, 3540, 3560, 3561, 4400

MAP REVISED
FEBRUARY 16, 2007

MAP NUMBER
37061CIND0C

State of North Carolina
Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

Article 67.
Swine Farms.

§ 106-800. Title.

This Article shall be known as the "Swine Farm Siting Act". (1995, c. 420, s. 1; 1995 (Reg. Sess., 1996), c. 626, s. 7(a); 1997-458, s. 4.1.)

§ 106-801. Purpose.

The General Assembly finds that certain limitations on the siting of swine houses and lagoons for swine farms can assist in the development of pork production, which contributes to the economic development of the State, by lessening the interference with the use and enjoyment of adjoining property. (1995, c. 420, s. 1; 1995 (Reg. Sess., 1996), c. 626, s. 7(a); 1997-458, s. 4.1.)

§ 106-802. Definitions.

As used in this Article, unless the context clearly requires otherwise:

(1) "Lagoon" means a confined body of water to hold animal byproducts including bodily waste from animals or a mixture of waste with feed, bedding, litter or other agricultural materials.

(2) Repealed by Session Laws 1995 (Regular Session, 1996), c. 626, s. 7.

(3) "Occupied residence" means a dwelling actually inhabited by a person on a continuous basis as exemplified by a person living in his or her home.

(3a) "Outdoor recreational facility" means any plot or tract of land on which there is located an outdoor swimming pool, tennis court, or golf course that is open to either the general public or to the members and guests of any organization having 50 or more members.

(4) "Site evaluation" means an investigation to determine if a site meets all federal and State standards as evidenced by the Waste Management Facility Site Evaluation Report on file with the Soil and Water Conservation District office or a comparable report certified by a professional engineer or a comparable report certified by a technical specialist approved by the North Carolina Soil and Water Conservation Commission.

(5) "Swine farm" means a tract of land devoted to raising 250 or more animals of the porcine species.

(6) "Swine house" means a building that shelters porcine animals on a continuous basis. (1995, c. 420, s. 1; 1995 (Reg. Sess., 1996), c. 626, s. 7(a); c. 743, s. 3; 1997-443, s. 11A.119(a); 1997-456, s. 15; 1997-458, s. 4.1; 1997-496, s. 12.)

§ 106-803. Siting requirements for swine houses, lagoons, and land areas onto which waste is applied at swine farms.

(a) A swine house or a lagoon that is a component of a swine farm shall be located:

(1) At least 1,500 feet from any occupied residence.

(2) At least 2,500 feet from any school; hospital; church; outdoor recreational facility; national park; State Park, as defined in G.S. 113-44.9; historic property acquired by the State pursuant to G.S. 121-9 or listed in the North Carolina Register of Historic Places pursuant to G.S. 121-4.1; or child care center, as defined in G.S. 110-86, that is licensed under Article 7 of Chapter 110 of the General Statutes.

(3) At least 500 feet from any property boundary.

(4) At least 500 feet from any well supplying water to a public water system, as defined in G.S. 130A-313.

(5) At least 500 feet from any other well that supplies water for human consumption. This subdivision does not apply to a well located on the same parcel or tract of land on which the swine house or lagoon is located and that supplies water only for use on that parcel or tract of land or for use on adjacent parcels or tracts of land all of which are under common ownership or control.

(a1) The outer perimeter of the land area onto which waste is applied from a lagoon that is a component of a swine farm shall be at least 75 feet from any boundary of property on which an occupied residence is located and from any perennial stream or river, other than an irrigation ditch or canal.

(a2) No component of a liquid animal waste management system for which a permit is required under Part 1 or 1A of Article 21 of Chapter 143 of the General Statutes, other than a land application site, shall be constructed on land that is located within the 100-year floodplain.

(b) A swine house or a lagoon that is a component of a swine farm may be located closer to a residence, school, hospital, church, or a property boundary than is allowed under subsection (a) of this section if written permission is given by the owner of the property and recorded with the Register of Deeds. (1995, c. 420, s. 1; 1995 (Reg. Sess., 1996), c. 626, s. 7(a); 1997-458, s. 4.1.)

§ 106-804. Enforcement.

(a) Any person who owns property directly affected by the siting requirements of G.S. 106-803 pursuant to subsection (b) of this section may bring a civil action against the owner or operator of a swine farm who has violated G.S. 106-803 and may seek any one or more of the following:

(1) Injunctive relief.

(2) An order enforcing the siting requirements under G.S. 106-803.

(3) Damages caused by the violation.

(b) A person is directly affected by the siting requirements of G.S. 106-803 only if the person owns a facility or property located within the siting requirements specified under G.S. 106-803.

(c) If the court determines it is appropriate, the court may award court costs, including reasonable attorneys' fees and expert witnesses' fees, to any party. If a temporary restraining order or preliminary injunction is sought, the court may require the filing of a bond or equivalent security. The court shall determine the amount of the bond or security.

(d) Nothing in this section shall restrict any other right that any person may have under any statute or common law to seek injunctive or other relief. (1995 (Reg. Sess., 1996), c. 626, s. 7(a); 1997-458, s. 4.1.)

§ 106-805. Written notice of swine farms.

Any person who intends to construct a swine farm whose animal waste management system is subject to a permit under Part 1 or 1A of Article 21 of Chapter 143 of the General Statutes shall, after completing a site evaluation and before the farm site is modified, notify all adjoining property owners; all property owners who own property located across a public road, street, or highway from the swine farm; the county or counties in which the farm site is located; and the local health department or departments having jurisdiction over the farm site of that person's intent to construct the swine farm. This notice shall be by certified mail sent to the address on record at the property tax office in the county in which the land is located. Notice to a county shall be sent to the county manager or, if there is no county manager, to the chair of

the board of county commissioners. Notice to a local health department shall be sent to the local health director. The written notice shall include all of the following:

(1) The name and address of the person intending to construct a swine farm.

(2) The type of swine farm and the design capacity of the animal waste management system.

(3) The name and address of the technical specialist preparing the waste management plan.

(4) The address of the local Soil and Water Conservation District office.

(5) Information informing the adjoining property owners and the property owners who own property located across a public road, street, or highway from the swine farm that they may submit written comments to the Division of Water Quality, Department of Environment and Natural Resources. (1995 (Reg. Sess., 1996), c. 626, s. 7(a); 1996, 2nd Ex. Sess., c. 18, s. 27.34(d); 1997-443, s. 11A.119(a); 1997-458, s. 4.1.)

§ 106-806. Construction or renovation of swine houses at preexisting swine farms.

(a) As used in this section, the following definitions apply:

(1) "New swine farm" means any swine farm the operations of which were sited on or after October 1, 1995. "New swine farm" does not include any preexisting swine farm, even if a subsequent site evaluation is performed on or after October 1, 1995, at the preexisting swine farm.

(2) "Preexisting swine farm" means any swine farm either the operations of which were begun prior to October 1, 1995, or the site evaluation of which was approved prior to October 1, 1995, by the Department of Environment and Natural Resources under Part 1A of Article 21 of Chapter 143 of the General Statutes.

(3) "Renovation or construction," "renovated or constructed," and any similar phrase mean any activity to renovate, construct, reconstruct, rebuild, modify, alter, change, restructure, upgrade, improve, enlarge, reduce, move, or otherwise perform construction work on a swine house that is a component of a swine farm.

(b) Notwithstanding any other provisions of this Article, a swine house that is a component of a preexisting swine farm can be constructed or renovated if the construction or renovation of that swine house satisfies all of the following requirements:

(1) The construction or renovation of the swine house does not result in an increase in the permitted capacity of the swine farm, as measured in the annual steady state live weight capacity of the swine farm.

(2) The construction or renovation of the swine house does not result in requiring an increase in the total permitted capacity of the animal waste management systems located at the swine farm.

(3) Except as provided in subsection (c) of this section, for any swine house that fails to meet any siting requirement for a swine house under G.S. 106-803, the construction or renovation of the swine house does not result in any portion of the constructed or renovated swine house being located any closer to the building or the property that is the object of the siting requirement that the swine house fails to meet.

(4) Regardless of the footprint of the existing swine house, renovation or construction of a swine house shall not be allowed in the 100-year floodplain.

(c) A swine house that is a component of a preexisting swine farm can be constructed or renovated such that it results in a portion of the constructed or renovated swine house being

located closer to a residence, school, hospital, church, or a property boundary than is allowed under subdivision (3) of subsection (b) of this section if written permission is given by the owner or owners of the property directly affected by the siting requirements specified under G.S. 106-803 and recorded with the register of deeds.

(d) This section does not apply to the construction or renovation of a swine house that is a component of a new swine farm. (2011-118, s. 1.)

§ 106-807. Reserved for future codification purposes.

§ 106-808. Reserved for future codification purposes.

§ 106-809. Reserved for future codification purposes.

ENVIRONMENTAL HEALTH

Understanding Concentrated Animal Feeding Operations and Their Impact on Communities

NALBOH

National Association of Local Boards of Health

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Understanding Concentrated Animal Feeding Operations and Their Impact on Communities

Author
Carrie Hribar, MA
Project Coordinator – Education and Training
National Association of Local Boards of Health

Editor
Mark Schultz, MEd
Grants Administrator/Technical Writer
National Association of Local Boards of Health

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1840 East Gypsy Lane Road
Bowling Green, Ohio 43402
www.nalboh.org

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Foreword

The National Association of Local Boards of Health (NALBOH) is pleased to provide *Understanding Concentrated Animal Feeding Operations and Their Impact on Communities* to assist local boards of health who have concerns about concentrated animal feeding operations (CAFOs) or large industrial animal farms in their communities. The Environmental Health Services Branch of the Centers for Disease Control and Prevention (CDC), National Center for Environmental Health (NCEH) encouraged the development of this product and provided technical oversight and financial support. This publication was supported by Cooperative Agreement Number 5U38HM000512. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the CDC.

The mission of NALBOH is to strengthen boards of health, enabling them to promote and protect the health of their communities, through education, technical assistance, and advocacy. Boards of health are responsible for fulfilling three public health core functions: assessment, policy development, and assurance. For a health agency, this includes overseeing and ensuring that there are sufficient resources, effective policies and procedures, partnerships with other organizations and agencies, and regular evaluation of an agency's services.

NALBOH is confident that *Understanding Concentrated Animal Feeding Operations and Their Impact on Communities* will help local board of health members understand their role in developing ways to mitigate potential problems associated with CAFOs. We trust that the information provided in this guide will enable board of health members to develop and sustain monitoring programs, investigate developing policy related to CAFOs, and create partnerships with other local and state agencies and officials to improve the health and well-being of communities everywhere.

A special thanks to Jeffrey Neistadt (NALBOH's Director – Education and Training), NALBOH's Environmental Health subcommittee, and any local board of health members and health department staff who were contacted during the development of this document for their contributions and support.

Notes

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Introduction

Livestock farming has undergone a significant transformation in the past few decades. Production has shifted from smaller, family-owned farms to large farms that often have corporate contracts. Most meat and dairy products now are produced on large farms with single species buildings or open-air pens (MacDonald & McBride, 2009). Modern farms have also become much more efficient. Since 1960, milk production has doubled, meat production has tripled, and egg production has quadrupled (Pew Commission on Industrial Animal Farm Production, 2009). Improvements to animal breeding, mechanical innovations, and the introduction of specially formulated feeds and animal pharmaceuticals have all increased the efficiency and productivity of animal agriculture. It also takes much less time to raise a fully grown animal. For example, in 1920, a chicken took approximately 16 weeks to reach 2.2 lbs., whereas now they can reach 5 lbs. in 7 weeks (Pew, 2009).

New technologies have allowed farmers to reduce costs, which mean bigger profits on less land and capital. The current agricultural system rewards larger farms with lower costs, which results in greater profit and more incentive to increase farm size.

AFO vs. CAFO

A CAFO is a specific type of large-scale industrial agricultural facility that raises animals, usually at high-density, for the consumption of meat, eggs, or milk. To be considered a CAFO, a farm must first be categorized as an animal feeding operation (AFO). An AFO is a lot or facility where animals are kept confined and fed or maintained for 45 or more days per year, and crops, vegetation, or forage growth are not sustained over a normal growing period (Environmental Protection Agency [EPA], 2009). CAFOs are classified by the type and number of animals they contain, and the way they discharge waste into the water supply. CAFOs are AFOs that contain at least a certain number of animals, or have a number of animals that fall within a range and have waste materials that come into contact with the water supply. This contact can either be through a pipe that carries manure or wastewater to surface water, or by animal contact with surface water that runs through their confined area. (See Appendix A)

History

AFOs were first identified as potential pollutants in the 1972 Clean Water Act. Section 502 identified "feedlots" as "point sources" for pollution along with other industries, such as fertilizer manufacturing. Consequently, a permit program entitled the National Pollutant Discharge Elimination System (NPDES) was created which set effluent limitation guidelines and standards (ELGs) for CAFOs. CAFOs have since been regulated by NPDES or a state equivalent since the mid-1970s. The definitions of what was considered an AFO or CAFO were created by the EPA for the NPDES process in 1976. These regulations remained in effect for more than 25 years, but increases and changes to farm size and production methods required an update to the permit system.

The regulations guiding CAFO permits and operations were revised in 2003. New inclusions in the 2003 regulations were that all CAFOs had to apply for a NPDES permit even if they only discharged in the event of a large storm. Large poultry operations were included in the regulations, regardless of their waste disposal system, and all CAFOs that held a NPDES permit were required to develop and implement a nutrient management plan. These plans had CAFOs identify ways to treat or process waste in a way that maintained nutrient levels at the appropriate amount.

The 2003 CAFO rule was subsequently challenged in court. A Second Circuit Court of Appeals decision required alteration to the CAFO permitting system. In *Water Keeper et al. vs. the EPA*, the court directed the EPA to remove the requirement for all CAFOs to apply for NPDES. Instead, the court required that nutrient management plans be submitted with the permit application, reviewed by officials and the public, and the terms of the plan be incorporated into the permit.

As a result of this court decision, the CAFO rule was again updated. The current final CAFO rule, which was revised in 2008, requires that only CAFOs which discharge or propose to discharge waste apply for permits. The EPA has also provided clarification in the discussion surrounding the rule on how CAFOs should assess whether they discharge or propose to discharge. There is also the opportunity to receive a no discharge certification for CAFOs that do not discharge or propose to discharge. This certification demonstrates that the CAFO is not required to acquire a permit. And while CAFOs were required to create nutrient management plans under the 2003 rule, these plans were now included with permit applications, and had a built-in time period for public review and comment.

Benefits of CAFOs

When properly managed, located, and monitored, CAFOs can provide a low-cost source of meat, milk, and eggs, due to efficient feeding and housing of animals, increased facility size, and animal specialization. When CAFOs are proposed in a local area, it is usually argued that they will enhance the local economy and increase employment. The effects of using local materials, feed, and livestock are argued to ripple throughout the economy, and increased tax expenditures will lead to increase funds for schools and infrastructure.

Environmental Health Effects

The most pressing public health issue associated with CAFOs stems from the amount of manure they produce. CAFO manure contains a variety of potential contaminants. It can contain plant nutrients such as nitrogen and phosphorus, pathogens such as *E. coli*, growth hormones, antibiotics, chemicals used as additives to the manure or to clean equipment, animal blood, silage leachate from corn feed, or copper sulfate used in footbaths for cows.

Depending on the type and number of animals in the farm, manure production can range between 2,800 tons and 1.6 million tons a year (Government Accountability Office [GAO], 2008). Large farms can produce more waste than some U.S. cities—a feeding operation with 800,000 pigs could produce over 1.6 million tons of waste a year. That amount is one and a half times more than the annual sanitary waste produced by the city of Philadelphia, Pennsylvania (GAO, 2008). Annually, it is estimated that livestock animals in the U.S. produce each year somewhere between 3 and 20 times more manure than people in the U.S. produce, or as much as 1.2–1.37 billion tons of waste (EPA, 2005). Though sewage treatment plants are required for human waste, no such treatment facility exists for livestock waste.

While manure is valuable to the farming industry, in quantities this large it becomes problematic. Many farms no longer grow their own feed, so they cannot use all the manure they produce as fertilizer. CAFOs must find a way to manage the amount of manure produced by their animals. Ground application of untreated manure is one of the most common disposal methods due to its low cost. It has limitations, however, such as the inability to apply manure while the ground is frozen. There are also limits as to how many nutrients from manure a land area can handle. Over application of livestock wastes can overload

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soil with macronutrients like nitrogen and phosphorous and micronutrients that have been added to animal feed like heavy metals (Burkholder et al., 2007). Other manure management strategies include pumping liquefied manure onto spray fields, trucking it off-site, or storing it until it can be used or treated. Manure can be stored in deep pits under the buildings that hold animals, in clay or concrete pits, treatment lagoons, or holding ponds.

Animal feeding operations are developing in close proximity in some states, and fields where manure is applied have become clustered. When manure is applied too frequently or in too large a quantity to an area, nutrients overwhelm the absorptive capacity of the soil, and either run off or are leached into the groundwater. Storage units can break or become faulty, or rainwater can cause holding lagoons to overflow. While CAFOs are required to have permits that limit the levels of manure discharge, handling the large amounts of manure inevitably causes accidental releases which have the ability to potentially impact humans.

The increased clustering and growth of CAFOs has led to growing environmental problems in many communities. The excess production of manure and problems with storage or manure management can affect ground and surface water quality. Emissions from degrading manure and livestock digestive processes produce air pollutants that often affect ambient air quality in communities surrounding CAFOs. CAFOs can also be the source of greenhouse gases, which contribute to global climate change.

All of the environmental problems with CAFOs have direct impact on human health and welfare for communities that contain large industrial farms. As the following sections demonstrate, human health can suffer because of contaminated air and degraded water quality, or from diseases spread from farms. Quality of life can suffer because of odors or insect vectors surrounding farms, and property values can drop, affecting the financial stability of a community. One study found that 82.8% of those living near and 89.5% of those living far from CAFOs believed that their property values decreased, and 92.2% of those living near and 78.9% of those living far from CAFOs believed the odor from manure was a problem. The study found that real estate values had not dropped and odor infestations were not validated by local governmental staff in the areas. However, the concerns show that CAFOs remain contentious in communities (Schmalzried and Fallon, 2007). CAFOs are an excellent example of how environmental problems can directly impact human and community well-being.

Groundwater

Groundwater can be contaminated by CAFOs through runoff from land application of manure, leaching from manure that has been improperly spread on land, or through leaks or breaks in storage or containment units. The EPA's 2000 National Water Quality Inventory found that 29 states specifically identified animal feeding operations, not just concentrated animal feeding operations, as contributing to water quality impairment (Congressional Research Service, 2008). A study of private water wells in Idaho detected levels of veterinary antibiotics, as well as elevated levels of nitrates (Batt, Snow, & Alga, 2006). Groundwater is a major source of drinking water in the United States. The EPA estimates that 53% of the population relies on groundwater for drinking water, often at much higher rates in rural areas (EPA, 2004). Unlike surface water, groundwater contamination sources are more difficult to monitor. The extent and source of contamination are often harder to pinpoint in groundwater than surface water contamination. Regular testing of household water wells for total and fecal coliform bacteria is a crucial element in monitoring groundwater quality, and can be the first step in discovering contamination issues related to CAFO discharge. Groundwater contamination can also affect surface water (Spellman &

Whiting, 2007). Contaminated groundwater can move laterally and eventually enter surface water, such as rivers or streams.

When groundwater is contaminated by pathogenic organisms, a serious threat to drinking water can occur. Pathogens survive longer in groundwater than surface water due to lower temperatures and protection from the sun. Even if the contamination appears to be a single episode, viruses could become attached to sediment near groundwater and continue to leach slowly into groundwater. One pollution event by a CAFO could become a lingering source of viral contamination for groundwater (EPA, 2005).

Groundwater can still be at risk for contamination after a CAFO has closed and its lagoons are empty. When given increased air exposure, ammonia in soil transforms into nitrates. Nitrates are highly mobile in soil, and will reach groundwater quicker than ammonia. It can be dangerous to ignore contaminated soil. The amount of pollution found in groundwater after contamination depends on the proximity of the aquifer to the CAFO, the size of the CAFO, whether storage units or pits are lined, the type of subsoil, and the depth of the groundwater.

If a CAFO has contaminated a water system, community members should be concerned about nitrates and nitrate poisoning. Elevated nitrates in drinking water can be especially harmful to infants, leading to blue baby syndrome and possible death. Nitrates oxidize iron in hemoglobin in red blood cells to methemoglobin. Most people convert methemoglobin back to hemoglobin fairly quickly, but infants do not convert back as fast. This hinders the ability of the infant's blood to carry oxygen, leading to a blue or purple appearance in affected infants. However, infants are not the only ones who can be affected by excess nitrates in water. Low blood oxygen in adults can lead to birth defects, miscarriages, and poor general health. Nitrates have also been speculated to be linked to higher rates of stomach and esophageal cancer (Bowman, Mueller, & Smith, 2000). In general, private water wells are at higher risk of nitrate contamination than public water supplies.

Surface Water

The agriculture sector, including CAFOs, is the leading contributor of pollutants to lakes, rivers, and reservoirs. It has been found that states with high concentrations of CAFOs experience on average 20 to 30 serious water quality problems per year as a result of manure management problems (EPA, 2001). This pollution can be caused by surface discharges or other types of discharges. Surface discharges can be caused by heavy storms or floods that cause storage lagoons to overfill, running off into nearby bodies of water. Pollutants can also travel over land or through surface drainage systems to nearby bodies of water, be discharged through manmade ditches or flushing systems found in CAFOs, or come into contact with surface water that passes directly through the farming area. Soil erosion can contribute to water pollution, as some pollutants can bond to eroded soil and travel to watersheds (EPA, 2001). Other types of discharges occur when pollutants travel to surface water through other mediums, such as groundwater or air.

Contamination in surface water can cause nitrates and other nutrients to build up. Ammonia is often found in surface waters surrounding CAFOs. Ammonia causes oxygen depletion from water, which itself can kill aquatic life. Ammonia also converts into nitrates, which can cause nutrient overloads in surface waters (EPA, 1998). Excessive nutrient concentrations, such as nitrogen or phosphorus, can lead to eutrophication and make water inhabitable to fish or indigenous aquatic life (Sierra Club Michigan Chapter, n.d.). Nutrient over-enrichment causes algal blooms, or a rapid increase of algae growth in an aquatic environment (Science Daily, n.d.). Algal blooms can cause a spiral of environmental problems to an aquatic system. Large groups of algae can block sunlight from underwater plant life, which are

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habitats for much aquatic life. When algae growth increases in surface water, it can also dominate other resources and cause plants to die. The dead plants provide fuel for bacteria to grow and increased bacteria use more of the water's oxygen supply. Oxygen depletion once again causes indigenous aquatic life to die. Some algal blooms can contain toxic algae and other microorganisms, including *Pfiesteria*, which has caused large fish kills in North Carolina, Maryland, and the Chesapeake Bay area (Spellman & Whiting, 2007). Eutrophication can cause serious problems in surface waters and disrupt the ecological balance.

Water tests have also uncovered hormones in surface waters around CAFOs (Burkholder et al., 2007). Studies show that these hormones alter the reproductive habits of aquatic species living in these waters, including a significant decrease in the fertility of female fish. CAFO runoff can also lead to the presence of fecal bacteria or pathogens in surface water. One study showed that protozoa such as *Cryptosporidium parvum* and *Giardia* were found in over 80% of surface water sites tested (Spellman & Whiting, 2007). Fecal bacteria pollution in water from manure land application is also responsible for many beach closures and shellfish restrictions.

Air Quality

In addition to polluting ground and surface water, CAFOs also contribute to the reduction of air quality in areas surrounding industrial farms. Animal feeding operations produce several types of air emissions, including gaseous and particulate substances, and CAFOs produce even more emissions due to their size. The primary cause of gaseous emissions is the decomposition of animal manure, while particulate substances are caused by the movement of animals. The type, amount, and rate of emissions created depends on what state the manure is in (solid, slurry, or liquid), and how it is treated or contained after it is excreted. Sometimes manure is "stabilized" in anaerobic lagoons, which reduces volatile solids and controls odor before land application.

The most typical pollutants found in air surrounding CAFOs are ammonia, hydrogen sulfide, methane, and particulate matter, all of which have varying human health risks. Table 1 on page 6 provides information on these pollutants.

Most manure produced by CAFOs is applied to land eventually and this land application can result in air emissions (Merkel, 2002). The primary cause of emission through land application is the volatilization of ammonia when the manure is applied to land. However, nitrous oxide is also created when nitrogen that has been applied to land undergoes nitrification and denitrification. Emissions caused by land application occur in two phases: one immediately following land application and one that occurs later and over a longer period as substances in the soil break down. Land application is not the only way CAFOs can emit harmful air emissions—ventilation systems in CAFO buildings can also release dangerous contaminants. A study by Iowa State University, which was a result of a lawsuit settlement between the Sierra Club and Tyson Chicken, found that two chicken houses in western Kentucky emitted over 10 tons of ammonia in the year they were monitored (Burns et al., 2007).

Most studies that examine the health effects of CAFO air emissions focus on farm workers, however some have studied the effect on area schools and children. While all community members are at risk from lowered air quality, children take in 20-50% more air than adults, making them more susceptible to lung disease and health effects (Kleinman, 2000). Researchers in North Carolina found that the closer children live to a CAFO, the greater the risk of asthma symptoms (Barrett, 2006). Of the 226 schools that were included in the study, 26% stated that there were noticeable odors from CAFOs outdoors, while 8% stated

Table 1 Typical pollutants found in air surrounding CAFOs.

CAFO Emissions	Source	Traits	Health Risks
Ammonia	Formed when microbes decompose undigested organic nitrogen compounds in manure	Colorless, sharp pungent odor	Respiratory irritant, chemical burns to the respiratory tract, skin, and eyes, severe cough, chronic lung disease
Hydrogen Sulfide	Anaerobic bacterial decomposition of protein and other sulfur containing organic matter	Odor of rotten eggs	Inflammation of the moist membranes of eye and respiratory tract, olfactory neuron loss, death
Methane	Microbial degradation of organic matter under anaerobic conditions	Colorless, odorless, highly flammable	No health risks. Is a greenhouse gas and contributes to climate change.
Particulate Matter	Feed, bedding materials, dry manure, unpaved soil surfaces, animal dander, poultry feathers	Comprised of fecal matter, feed materials, pollen, bacteria, fungi, skin cells, silicates	Chronic bronchitis, chronic respiratory symptoms, declines in lung function, organic dust toxic syndrome

they experience odors from CAFOs inside the schools. Schools that were closer to CAFOs were often attended by students of lower socioeconomic status (Mirabelli, Wing, Marshall, & Wilcosky, 2006).

There is consistent evidence suggesting that factory farms increase asthma in neighboring communities, as indicated by children having higher rates of asthma (Sigurdarson & Kline, 2006; Mirabelli et al., 2006). CAFOs emit particulate matter and suspended dust, which is linked to asthma and bronchitis. Smaller particles can actually be absorbed by the body and can have systemic effects, including cardiac arrest. If people are exposed to particulate matter over a long time, it can lead to decreased lung function (Michigan Department of Environmental Quality [MDEQ] Toxics Steering Group [TSG], 2006). CAFOs also emit ammonia, which is rapidly absorbed by the upper airways in the body. This can cause severe coughing and mucous build-up, and if severe enough, scarring of the airways. Particulate matter may lead to more severe health consequences for those exposed by their occupation. Farm workers can develop acute and chronic bronchitis, chronic obstructive airways disease, and interstitial lung disease. Repeated exposure to CAFO emissions can increase the likelihood of respiratory diseases. Occupational asthma, acute and chronic bronchitis, and organic dust toxic syndrome can be as high as 30% in factory farm workers

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(Horrigan, Lawrence, & Walker, 2002). Other health effects of CAFO air emissions can be headaches, respiratory problems, eye irritation, nausea, weakness, and chest tightness.

There is evidence that CAFOs affect the ambient air quality of a community. There are three laws that potentially govern CAFO air emissions—the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, also known as the Superfund Act), the Emergency Planning & Community Right to Know Act (EPCRA), and the Clean Air Act (CAA). However, the EPA passed a rule that exempts all CAFOs from reporting emissions under CERCLA. Only CAFOs that are classified as large are required to report any emission event of 100 pounds of ammonia or hydrogen sulfide or more during a 24-hour period locally or to the state under EPCRA (Michigan State University Extension, n.d.). The EPA has also instituted a voluntary Air Quality Compliance Agreement in which they will monitor some CAFO air emissions, and will not sue offenders but instead charge a small civil penalty. These changes have attracted criticism from environmental and community leaders who state that the EPA has yielded to influence from the livestock industry. The changes also leave ambiguity as to whether emission standards and air quality near CAFOs are being monitored.

Greenhouse Gas and Climate Change

Aside from the possibility of lowering air quality in the areas around them, CAFOs also emit greenhouse gases, and therefore contribute to climate change. Globally, livestock operations are responsible for approximately 18% of greenhouse gas production and over 7% of U.S. greenhouse gas emissions (Massey & Ulmer, 2008). While carbon dioxide is often considered the primary greenhouse gas of concern, manure emits methane and nitrous oxide which are 23 and 300 times more potent as greenhouse gases than carbon dioxide, respectively. The EPA attributes manure management as the fourth leading source of nitrous oxide emissions and the fifth leading source of methane emissions (EPA, 2009).

The type of manure storage system used contributes to the production of greenhouse gases. Many CAFOs store their excess manure in lagoons or pits, where they break down anaerobically (in the absence of oxygen), which exacerbates methane production. Manure that is applied to land or soil has more exposure to oxygen and therefore does not produce as much methane. Ruminant livestock, such as cows, sheep, or goats, also contribute to methane production through their digestive processes. These livestock have a special stomach called a rumen that allows them to digest tough grains or plants that would otherwise be unusable. It is during this process, called enteric fermentation, that methane is produced. The U.S. cattle industry is one of the primary methane producers. Livestock production and meat and dairy consumption has been increasing in the United States, so it can only be assumed that these greenhouse gas emissions will also rise and continue to contribute to climate change.

Odors

One of the most common complaints associated with CAFOs are the odors produced. The odors that CAFOs emit are a complex mixture of ammonia, hydrogen sulfide, and carbon dioxide, as well as volatile and semi-volatile organic compounds (Heederik et al., 2007). These odors are worse than smells formerly associated with smaller livestock farms. The anaerobic reaction that occurs when manure is stored in pits or lagoons for long amounts of time is the primary cause of the smells. Odors from waste are carried away from farm areas on dust and other air particles. Depending on things like weather conditions and farming techniques, CAFO odors can be smelled from as much as 5 or 6 miles away, although 3 miles is a more common distance (State Environmental Resource Center, 2004).

Because CAFOs typically produce malodors, many communities want to monitor emissions and odors. Quantifying odor from industrial farming can be challenging because it is a mixture of free and particle-bound compounds, which can make it hard to identify what specifically is causing the odor. Collecting data on specific gases, such as hydrogen sulfide, can be used as a proxy for odor levels.

CAFO odors can cause severe lifestyle changes for individuals in the surrounding communities and can alter many daily activities. When odors are severe, people may choose to keep their windows closed, even in high temperatures when there is no air conditioning. People also may choose to not let their children play outside and may even keep them home from school. Mental health deterioration and an increased sensitization to smells can also result from living in close proximity to odors from CAFOs. Odor can cause negative mood states, such as tension, depression, or anger, and possibly neurophysciatric abnormalities, such as impaired balance or memory. People who live close to factory farms can develop CAFO-related post traumatic stress disorder, including anxiety about declining quality of life (Donham et al., 2007).

Ten states use direct regulations to control odors emitted by CAFOs. They prohibit odor emissions greater than a set standard. States with direct regulations use scentometers, which measure how many times an odor has to be doused with clean air before the smell is undetectable. An additional 34 states have indirect methods to reduce CAFO odors. These include: setbacks, which specify how far CAFO structures have to be from other buildings; permits, which are the most typical way of regulating CAFOs; public comment or involvement periods; and operator or manure placement training.

Insect Vectors

CAFOs and their waste can be breeding grounds for insect vectors. Houseflies, stable flies, and mosquitoes are the most common insects associated with CAFOs. Houseflies breed in manure, while stable and other flies breed in decaying organic material, such as livestock bedding. Mosquitoes breed in standing water, and water on the edges of manure lagoons can cause mosquito infestations to rise. Flies can change from eggs to adults in only 10 days, which means that substances in which flies breed need to be cleaned up regularly.

Flies are typically considered only nuisances, although insects can agitate livestock and decrease animal health. The John Hopkins Bloomberg School of Public Health found evidence that houseflies near poultry operations may contribute to the dispersion of drug-resistant bacteria (Center for Livable Future, 2009). Since flies are attracted to and eat human food, there is a potential for spreading bacteria or pathogens to humans, including microbes that can cause dysentery and diarrhea (Bowman et al., 2000). Mosquitoes spread zoonotic diseases, such as West Nile virus, St. Louis encephalitis, and equine encephalitis.

Residences closest to the feeding operations experience a much higher fly population than average homes. To lower the rates of insects and any accompanying disease threats, standing water should we cleaned or emptied weekly, and manure or decaying organic matter should be removed twice weekly (Purdue Extension, 2007). For more specific insect vector information, please refer to NALBOH's vector guide (*Vector Control Strategies for Local Boards of Health*).

Pathogens

Pathogens are parasites, bacterium, or viruses that are capable of causing disease or infection in animals or humans. The major source of pathogens from CAFOs is in animal manure. There are over 150 pathogens in manure that could impact human health. Many of these pathogens are concerning because

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they can cause severe diarrhea. Healthy people who are exposed to pathogens can generally recover quickly, but those who have weakened immune systems are at increased risk for severe illness or death. Those at higher risk include infants or young children, pregnant women, the elderly, and those who are immunosuppressed, HIV positive, or have had chemotherapy. This risk group now roughly compromises 20% of the U.S. population.

Table 2 Select pathogens found in animal manure.

Pathogen	Disease	Symptoms
Bacillus anthracis	Anthrax	Skin sores, headache, fever, chills, nausea, vomiting
Escherichia coli	Colibacilosis, Coliform mastitis-metris	Diarrhea, abdominal gas
Leptospira pomona	Leptospirosis	Abdominal pain, muscle pain, vomiting, fever
Listeria monocytogenes	Listerosis	Fever, fatigue, nausea, vomiting, diarrhea
Salmonella species	Salmonellosis	Abdominal pain, diarrhea, nausea, chills, fever, headache
Clostirdum tetani	Tetanus	Violent muscle spasms, lockjaw, difficulty breathing
Histoplasma capsulatum	Histoplasmosis	Fever, chills, muscle ache, cough rash, joint pain and stiffness
Microsporum and *Trichophyton*	Ringworm	Itching, rash
Giardia lamblia	Giardiasis	Diarrhea, abdominal pain, abdominal gas, nausea, vomiting, fever
Cryptosporidium species	Cryptosporidosis	Diarrhea, dehydration, weakness, abdominal cramping

Sources of infection from pathogens include fecal-oral transmission, inhalation, drinking water, or incidental water consumption during recreational water activities. The potential for transfer of pathogens among animals is higher in confinement, as there are more animals in a smaller amount of space. Healthy or asymptomatic animals may carry microbial agents that can infect humans, who can then spread that infection throughout a community, before the infection is discovered among animals.

When water is contaminated by pathogens, it can lead to widespread outbreaks of illness. Salmonellosis, cryptosporidiosis, and giardiasis can cause nausea, vomiting, fever, diarrhea, muscle pain, and death, among other symptoms. *E.coli* is another serious pathogen, and can be life-threatening for the young, elderly, and immunocompromised. It can cause bloody diarrhea and kidney failure. Since many CAFO use sub-therapeutic antibiotics with their animals, there is also the possibility that disease-resistant bacteria can emerge in areas surrounding CAFOs. Bacteria that cannot be treated by antibiotics can have very serious effects on human health, potentially even causing death (Pew Charitable Trusts, n.d.).

There is also the possibility of novel (or new) viruses developing. These viruses generate through mutation or recombinant events that can result in more efficient human-to-human transmission. There has been some speculation that the novel H1N1 virus outbreak in 2009 originated in swine CAFOs in Mexico. However, that claim has never been substantiated. CAFOs are not required to test for novel viruses, since they are not on the list of mandatory reportable illness to the World Organization for Animal Health.

Antibiotics

Antibiotics are commonly administered in animal feed in the United States. Antibiotics are included at low levels in animal feed to reduce the chance for infection and to eliminate the need for animals to expend energy fighting off bacteria, with the assumption that saved energy will be translated into growth. The main purposes of using non-therapeutic doses of antimicrobials in animal feed is so that animals will grow faster, produce more meat, and avoid illnesses. Supporters of antibiotic use say that it allows animals to digest their food more efficiently, get the most benefit from it, and grow into strong and healthy animals.

The trend of using antibiotics in feed has increased with the greater numbers of animals held in confinement. The more animals that are kept in close quarters, the more likely it is that infection or bacteria can spread among the animals. Seventy percent of all antibiotics and related drugs used in the U.S. each year are given to beef cattle, hogs, and chickens as feed additives. Nearly half of the antibiotics used are nearly identical to ones given to humans (Kaufman, 2000).

There is strong evidence that the use of antibiotics in animal feed is contributing to an increase in antibiotic-resistant microbes and causing antibiotics to be less effective for humans (Kaufman, 2000). Resistant strains of pathogenic bacteria in animals, which can be transferred to humans thought the handling or eating of meat, have increased recently. This is a serious threat to human health because fewer options exist to help people overcome disease when infected with antibiotic-resistant pathogens. The antibiotics often are not fully metabolized by animals, and can be present in their manure. If manure pollutes a water supply, antibiotics can also leech into groundwater or surface water.

Because of this concern for human health, there is a growing movement to eliminate the non-therapeutic use of antibiotics with animals. In 2001, the American Medical Association approved a resolution to ban all low-level use of antibiotics. The USDA has developed guidelines to limit low-level use, and some major meat buyers (such as McDonald's) have stopped using meat that was given antibiotics that are also used for humans. The World Health Organization is also widely opposed to the use of antibiotics, calling for a cease of their low-level use in 2003. Some U.S. legislators are seeking to ban the routine use of antibiotics with livestock, and there has been legislation proposed to solidify a ban. The Preservation of Antibiotics for Medical Treatment Act (PAMTA), which was introduced in 2009, has the support of over 350 health,

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consumer, and environmental groups (H.R. 1549/S. 619). The act, if passed, would ban seven classes of antibiotics important to human health from being used in animals, and would restrict other antibiotics to therapeutic and some preventive uses.

Other Effects – Property Values

Most landowners fear that when CAFOs move into their community their property values will drop significantly. There is evidence that CAFOs do affect property values. The reasons for this are many: the fear of loss of amenities, the risk of air or water pollution, and the increased possibility of nuisances related to odors or insects. CAFOs are typically viewed as a negative externality that can't be solved or cured. There may be stigma that is attached to living by a CAFO.

The most certain fact regarding CAFOs and property values are that the closer a property is to a CAFO, the more likely it will be that the value of the property will drop. The exact impact of CAFOs fluctuates depending on location and local specifics. Studies have found differing results of rates of property value decrease. One study shows that property value declines can range from a decrease of 6.6% within a 3-mile radius of a CAFO to an 88% decrease within 1/10 of a mile from a CAFO (Dakota Rural Action, 2006). Another study found that property value decreases are negligible beyond 2 miles away from a CAFO (Purdue Extension, 2008). A third study found that negative effects are largest for properties that are downwind and closest to livestock (Herriges, Secchi, & Babcock, 2005). The size and type of the feeding operation can affect property value as well. Decreases in property values can also cause property tax rates to drop, which can place stress on local government budgets.

Considerations for Boards of Health

Right-to-Farm Laws

With all of the potential environmental and public health effects from CAFOs, community members and health officials often resort to taking legal action against these industrial animal farms. However, there are some protections for farms in place that can make lawsuits hard to navigate. Right-to-farm laws were created to address conflicts between farmers and non-farming neighbors. They seek to override common laws of nuisance, which forbid people to use their property in ways that are harmful to others, and protect farmers from unreasonable controls on farming.

All 50 states have some form of right-to-farm laws, but most only offer legal protections to farms if they meet certain specifications. Generally, they must be in compliance with all environmental regulations, be properly run, and be present in a region first before suburban developments, often a year before the plaintiff moves to that area. These right-to-farm laws were originally created in the late 1970s and early 1980s to protect family farms from suburban sprawl, at a time when large industrial farms were not the norm. As industrial farms grew in size and number, the agribusiness industry lobbied for and achieved the passage of stricter laws in the 1990s, many of which are now being challenged in court by homeowners and small family farmers. Opponents to these laws argue that they deprive them of their use of property and therefore violate the Fifth Amendment to the Constitution.

Some state courts have overturned their strict right-to-farm laws, such as Iowa, Michigan, Minnesota, and Kansas. Others such as Vermont have rewritten their laws. Vermont's updated right-to-farm bill

protects established farm practices as long as there is not a substantial adverse effect on health, safety, or welfare.

Boards of health need to be aware of what legal protection their state offers farms. Right-to-farm laws can hinder nuisance complaints brought about by community members. State laws can prevent local government or health officials from regulating industrial farms.

Board of Health Involvement with CAFOs

Boards of health are responsible for fulfilling the three public health core functions: assessment, policy development, and assurance. Boards of health can fulfill these functions through addressing problems stemming from CAFOs in their communities. Specific public health services that can tackled regarding CAFOs include monitoring health status, investigating health problems, developing policies, enforcing regulations, informing and educating people about CAFOs, and mobilizing community partnerships to spread awareness about environmental health issues related to CAFOs.

Assessment: Board of health members should ensure that there is an effective method in place for collecting and tracking public complaints about CAFOs and large animal farms. Since environmental health specialists at local health departments are often responsible for investigating complaints, the board of health must take measures to ensure that they are properly trained and educated about CAFOs. It is possible that the board of health may be responsible or choose to do some investigations itself. Schmalzried and Fallon (2008) advocate that local health districts adopt a proactive approach for addressing public concerns about CAFOs, stating that health districts can offer some services that may help ease public frustration with CAFOs. A fly trapping program can establish a baseline for the average number of flies present prior to the start-up of CAFOs or large animal farms, which can then establish if a fly nuisance exists in the area. Testing for water quality and quantity can provide evidence if CAFOs are suspected of affecting private water supplies. Boards of health can also monitor exposure incidences that occur in emergency rooms to determine if migrant or farm workers are developing any adverse health conditions as a result of their work environments. Establishing these programs benefit both members of the community and provide information to future animal farm operators, and local boards of health should recommend them if they've been receiving complaints about CAFOs.

Policy Development: Boards of health in many states can adopt health-based regulations about CAFOs, however, they may be met with some resistance. Humbolt County, Iowa, adopted four health-based ordinances concerning CAFOs that became models for regulations in other states, but the Iowa Supreme Court ruled the ordinances were irreconcilable with state laws. Boards of health that choose to regulate CAFOs can also be subject to pressure from outside forces, including possible lawsuits or withdrawal of funding. Boards of health should also consider working with other local officials to institute regulations on CAFOs, such as zoning ordinances.

Assurance: Boards of health can execute the assurance function by advocating for or educating about better environmental practices with CAFOs. Board members may receive complaints from the public about CAFOs, and boards can hold public meetings to receive complaints and hear public testimony about farms. If boards of health are not capable of regulating industrial farms in their communities, they can still try to collaborate with other local agencies that have jurisdiction. Board of health members can educate other local agencies and public officials about CAFOs and spread awareness about the environmental and health hazards. They can request a public hearing with the permitting agency of the

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CAFO to express their concerns about the potential health effects. They can also work with agricultural and farm representatives to teach better environmental practices and pollution reduction techniques.

In many states, boards of health are empowered to adopt more stringent rules than the state law if it is necessary to protect public health. Board of health members should examine their state laws before they take any action regarding CAFOs to determine the most appropriate course of action. Any process should include an investigative period to gather evidence, public hearings, and a time for public review of draft policies.

Board of Health Case Studies

Tewksbury Board of Health, Massachusetts

Locals have complained about Krochmal Farms, a pig farm, for many years, but complaints have increased recently. The addition of a hog finishing facility to the farm coincided with the time that community member complaints grew. Most complaints are centered on the odor coming from the farm. The complaints were originally just logged when phone calls were received; however, the health department added a data tracking system as the number of complaints increased. After a complaint is received, the sanitarian or health director does a site visit to investigate.

The health director in Tewksbury filed an order of prohibition against the farm, which is allowed under Massachusetts law 111, section 143, for anything that threatens public health. The order of prohibition was appealed and the matter was taken to the board of health for a grievance hearing. The board of health hearing included months of testimony about the pig farm. The board of health is also doing a site assignment, which determines if a location is appropriate for treating, storing, or disposing of waste, including agricultural waste. The site assignment process includes both the Department of Environmental Protection (DEP) and the local board of health. The board of health holds a public hearing process, while the DEP reviews the site assignment application. The board of health grants the site assignment only if it is concurrently approved by the DEP.

The health director in Tewksbury points out that the only laws the board of health is able to regulate the farm under are nuisance laws. There have been efforts by the community to do a home rule petition to address the air quality and pest management complaints. The home rule petition is currently working its way through the Massachusetts state house. The status of the petition is unknown.

The board of health has tried to work directly with the pig farm to manage complaints. The farm contains manure composting facilities and the health district has requested advance notice to warn the community before manure is treated or applied to the soil. The farm has adopted a new manure management system. This system uses Rapp technology to control odors and reduce ammonia and hydrogen sulfide levels. However, questions still remain as to whether this addition will fully solve the odor issue. Typically, systems using Rapp technology include an oil cap that floats on manure holding pools and helps seal odors inside. These techniques have been researched and proven to reduce odors. However, the Tewksbury farm did not install the oil cap, and it is unknown whether the exclusion of the cap will hinder the technology's ability to reduce odors.

The complaints about the farm primarily concern the odor that emanates from the farm. The complaints do include mention of health side effects, including nausea and burning eyes. The health director has also heard concerns about potential environmental effects from the pig manure. Community members are

worried the manure runoff is entering and contaminating Sutton Brook, since there has been flooding in that area. There has been no confirmation of this occurring. The board of health is aware that the farm has a nutrient management plan, but they are not allowed to request and find out what is incorporated in that plan.

The Tewksbury piggery is technically not classified as a CAFO, though it is believed to be the largest pig farm in the commonwealth of Massachusetts. The area around it has become densely populated and the community members state that they just want to live peacefully with the farm. The board of health has submitted multiple grant applications to study the health effects associated with the farm. After the site assignment process is complete, the board of health will decide how it will regulate the farm. At the beginning of 2010, the board of health was still working on drafting regulations for the pig farms.

Wood County Board of Health, Ohio

Wood County, Ohio, contains two existing large dairy farms, both of which were proposed in 2001 to be expanded to over 1500 cows each. It is also the site for three other proposed dairy farms. There is a large community effort that supports restricting the operation and expansion of these farms, mainly represented by the community group Wood County Citizens Opposed to Factory Farms. The Wood County Board of Health became involved in investigating these dairy farms through this community group and other local officials. The Trustees of Liberty Township requested assistance from the Wood County Board of Health in supporting a moratorium on factory farm operations until local regulations were in effect. The trustees believed that manure runoff from the farms could contaminate local waterways, lower the ground water table, increase the presence of insect vectors, and devalue local properties.

The Wood County Health Director, in cooperation with the board of health, contacted nearby counties to determine what actions they had taken against farms in their communities. While the health director and board of health investigated action in the form of a nuisance regulation against the farms, they were advised that nuisance lawsuits filed against farms in Ohio were held to a tough standard, and they would be forced to demonstrate with scientific proof that the farms have a substantial adverse effect on health. They found that no other board of health in Ohio had opted to regulate farming operations and relied on the enforcement of existing state laws.

The board of health held a public forum to hear public opinion regarding the industrial farms. Ultimately, the Wood County Board of Health took actions other than regulations to help protect the health and environment of its community. They helped community members protect the safety of their water wells by offering free and low cost water well testing and inspections. They tested area ditch and water ways for fecal coliform bacteria, phosphorous, and nitrates to monitor the impact of farm runoff. They also purchased fly traps to monitor and count fly types to determine if the farms have caused an increase in insect vectors. Board of health members also met with state officials from the Ohio EPA in an effort to facilitate cooperation regarding the factory farms. While the Wood County Board of Health and Health Department chose not to institute any local regulations, they continue to monitor the situation and respond to community complaints.

Cerro Gordo County Board of Health, Iowa

Officials in Cerro Gordo County, Iowa, began looking into regulating animal feeding operations after the number of hog farms in Iowa started to grow. Floods in North Carolina and new regulations in Colorado meant that many hog farms began relocating to Iowa. Many citizens had concerns over the effects of

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CAFOs, and the Iowa State Association of Counties wanted to review air quality issues. Officials in Cerro Gordo County originally began working on a regulation that required inspections and was based on public health concerns, since farms were already exempt from any regulations related to zoning. However, Iowa state senators soon introduced legislation that passed and prevented any animal feeding operations from being regulated from a public health angle as well.

As Iowans were now prevented from regulating animal feeding operations in terms of zoning or public health, officials in Cerro Gordo County decided to place a moratorium on the construction of new animal feeding operations in that county. They wanted to temporarily stop the growth of animal feeding operations until they could get better science about their effects. Cerro Gordo County Ordinance #40, the "Animal Confinement Moratorium Ordinance," went into effect on May 14, 2002. Since the moratorium did not address public health or zoning, officials were able to get around the rules and still have a way to temporarily control animal feeding operation growth in their county. The ordinance placed "a 1-year moratorium on any new construction, expansion, or activity occurring on land used for the production, care, feeding, or housing of animals." The ordinance also afforded "local public health officials adequate time to appropriately assess health and environmental concerns that may be related to confined animal feeding operations and concentration of animals; establish objective measurable standards of enforcement; exercise the Board of Health's responsibility to protect and improve the health of the public; refrain from impacting farm operators unfairly; and provide penalties for violations of the provisions hereof pursuant to Chapter 137, Code of Iowa" (Cerro Gordo County, 2002).

The moratorium was first adopted by the Cerro Gordo County Board of Health. It was then presented to the county board of supervisors by the health director on behalf of the board of health. Before the board of health adopted the moratorium, they held an investigative meeting in which representatives from the Iowa Farm Bureau and other industry spokespeople exchanged opinions on the issue of animal feeding operations. The moratorium was created through a collaboration between local and county officials—health department staff, the board of health, and the board of supervisors. The moratorium did not receive any help or backing from state officials, who were concerned about the political nature of the ordinance. However it did receive backing from a *Globe Gazette* editorial.

The moratorium was immediately met with resistance from state officials. The Cerro Gordo County Board of Supervisors was contacted by a local legislator, and the Iowa Farm Bureau stated they would challenge the county budget. The Iowa Farm Bureau threatened to take the county to court. There were concerns over the cost of a court trial, which was estimated to be as high as $60,000. The county attorney doubted the legality of the moratorium and ultimately recommended removing it. The moratorium was in effect until June of 2005, when it was repealed by the county board of supervisors.

Since the moratorium was repealed there have been a few hog farms built in Cerro Gordo County, but the decline in pork prices has prevented any large growth of hog farms. Health officials believe that if the county had not implemented the animal confinement moratorium, there would have been many more farms built in their county, since many hog farms were built in counties south of Cerro Gordo County. There is now a process for siting new animal confinement operations in Iowa that uses a Master Matrix scoring system. The Cerro Gordo County Board of Supervisors tracks the Master Matrix system, but so far no animal feeding operations in Iowa who have applied using this system have been denied the right to build.

Conclusion

Concentrated animal feeding operations or large industrial animal farms can cause a myriad of environmental and public health problems. While they can be maintained and operated properly, it is important to ensure that they are routinely monitored to avoid harm to the surrounding community. While states have differing abilities to regulate CAFOs, there are still actions that boards of health can and should take. These actions can be as complex as passing ordinances or regulations directed at CAFOs or can be simply increasing water and air quality testing in the areas surrounding CAFOs. Since CAFOs have such an impact locally, boards of health are an appropriate means for action. Boards of health should take an active role with CAFOs, including collaboration with other state and local agencies, to mitigate the impact that CAFOs or large industrial farms have on the public health of their communities.

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Appendix A: Regulatory Definitions of Large CAFOs, Medium CAFOs, and Small CAFOs

Animal Sector	Size Thresholds (number of animals)		
	Large CAFOs	**Medium CAFOs[1]**	**Small CAFOs[2]**
Cattle or cow/calf pairs	1,000 or more	300-999	Less than 300
Mature dairy cattle	700 or more	200-699	Less than 200
Veal calves	1,000 or more	300-999	Less than 300
Swine (over 55 pounds)	2,500 or more	750-2,500	Less than 750
Swine (under 55 pounds)	10,000 or more	3,000-9,999	Less than 3,000
Horses	500 or more	150-499	Less than 150
Sheep or lambs	10,000 or more	3,000-9,999	Less than 3,000
Turkeys	55,000 or more	16,500-54,999	Less than 16,500
Laying hens or broilers[3]	30,000 or more	9,000-29,999	Less than 9,000
Chickens other than laying hens[4]	125,000 or more	37.500-124,999	Less than 37,500
Laying hens[4]	82,000 or more	25,000-81,999	Less than 25,000
Ducks[4]	30,000 or more	10,000-29,999	Less than 10,000
Ducks[3]	5,000 or more	1,500-4,999	Less than 1,500

Data: Environmental Protection Agency

1 Must also meet one of two “method of discharge” criteria to be defined as a CAFO or must be designated.

2 Never a CAFO by regulatory definition, but may be designated as a CAFO on a case-by-case basis.

3 Liquid manure handling system

4 Other than a liquid manure handling system

Appendix B: Additional Resources

American Public Health Association. *Precautionary moratorium on new concentrated animal feed operations*. http://www.apha.org/advocacy/policy/policysearch/default.htm?id=1243

Center for a Livable Future. http://www.livablefutureblog.com/

Environmental Health Sciences Research Center. *Iowa concentrated animal feeding operation air quality study*. http://www.public-health.uiowa.edu/ehsrc/CAFOstudy.htm

Environmental Protection Agency. *Animal feeding operations*. http://cfpub.epa.gov/npdes/home.cfm?program_id=7

Food and Water Watch. http://www.foodandwaterwatch.org/

Impacts of CAFOs on Rural Communities. http://web.missouri.edu/ikerdj/papers/Indiana%20--%20CAFOs%20%20Communities.htm#_ftn1

Land Stewardship Project. http://www.landstewardshipproject.org/index.html

Midwest Environmental Advocates. http://www.midwestadvocates.org/

National Agriculture Law Center. *Animal feeding operations reading room*. http://www.nationalaglawcenter.org/readingrooms/afos

National Association of Local Boards of Health. *Vector control strategies for local boards of health*. http://www.nalboh.org/publications.htm

Pew Charitable Trusts. *Human health and industrial farming*. http://www.saveantibiotics.org/index.html

Pew Commission on Industrial Animal Farm Production. http://www.ncifap.org/

Purdue Extension. *Concentrated animal feeding operations*. http://www.ansc.purdue.edu/CAFO/

State Environmental Resource Center. http://serconline.org

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NC DEQ: Animal Facility Map | DWR Animal Operation Per...

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DWR Animal Operation Permits

As of February 2016

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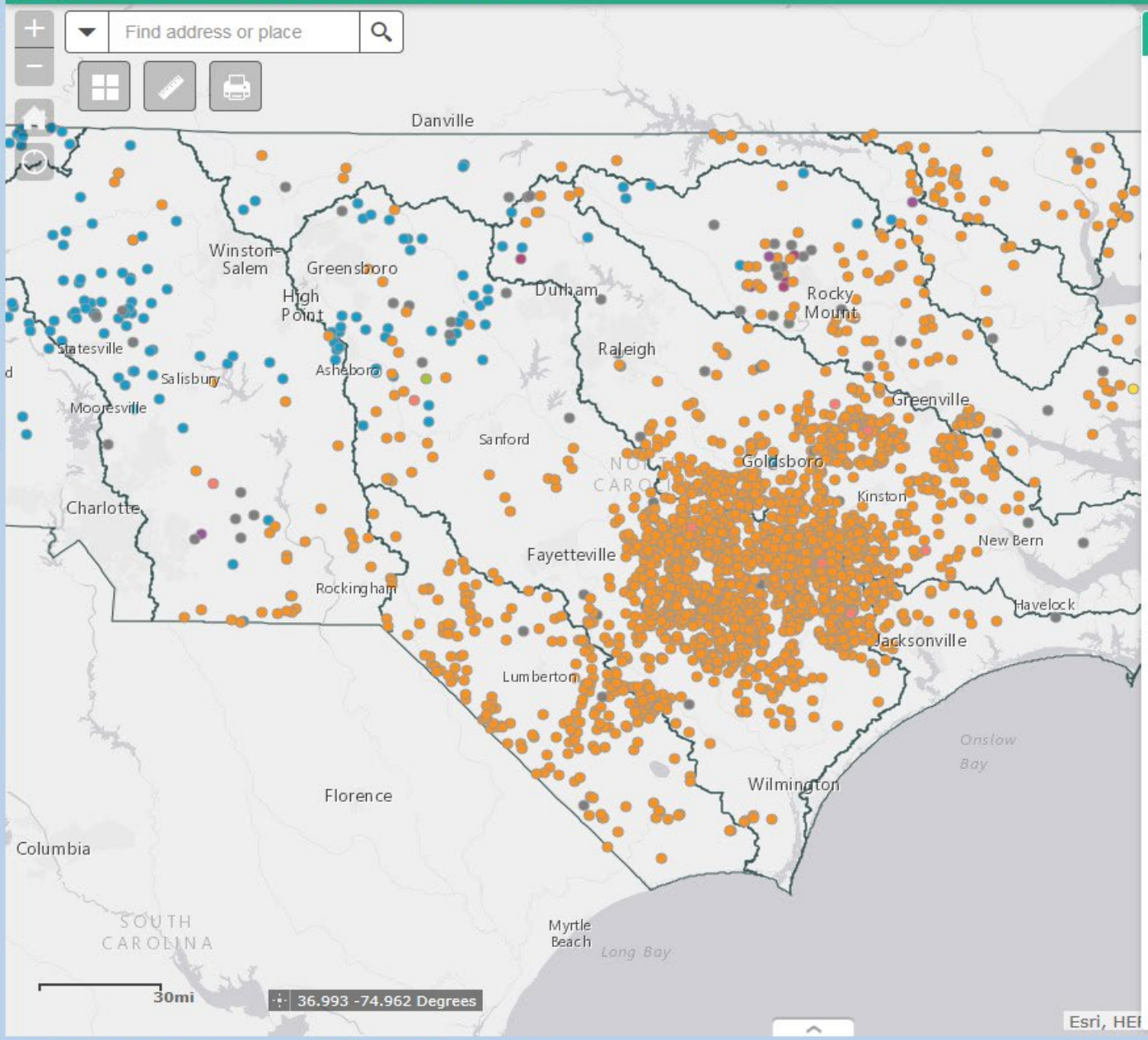

Legend

DWR Animal Operation Permits

- Swine State COC
- Swine NPDES COC
- Cattle State COC
- Cattle NPDES COC
- Wet Poultry State COC
- Wet Poultry NPDES COC
- Animal Individual State
- Animal Individual NPDES
- Other

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Comment 13: Jocelyn D'Ambrosia of Earthjustice, Gray Jernigan of Waterkeeper Alliance, and Chandra Taylor of Southern Environmental Law Center, on behalf of the Catawba Riverkeeper Foundation, Cape Fear River Watch, Neuse Riverkeeper Foundation, North Carolina Environmental Justice Network, Pamlico-Tar River Foundation, Waterkeepers Carolina, Western North Carolina Alliance, Winyah Rivers Foundation, and Yadkin Riverkeeper, Inc., submitted the following comments:

> 1. The general permits do not meet the non-discharge requirements; facilities under the permits are discharging significant nutrient and bacteria loads to watersheds across North Carolina. DENR must use the renewal period as an opportunity to assess whether facilities are complying with the permits and come up with alternative measures to control pollution from these facilities.

Response: General Permits are for non-discharge animal waste management systems in accordance with G.S. §143-215. Condition I.1 requires systems covered by these General Permits be effectively maintained and operated as non-discharge systems. The Division conducts inspections of all permitted animal operations annually to determine if the system is in compliance with its animal waste management plan and Permit as required by G.S. §143-215.10F. The Division may also conduct sampling as needed to determine if there are any violations of water quality standards, per Condition IV.1.d.

In response to the 2008 Petition for Rule-Making regarding monitoring at animal operations, the Division initiated a monitoring study conducted by the United States Geological Survey (USGS). The USGS collected samples in fifty-four watersheds to identify detectible contributions of pollutants from animal operations. The full report on the study including analysis and results is expected to be finalized and release later in 2014.

> 2. General permits should be modified to come into compliance with Title VI of the Civil Rights Act of 1964 in addressing the following.
>
> a. Swine facilities are disproportionately concentrated in communities of color. African American communities disproportionately bear the impact of swine facilities.
>
> b. Lagoon sprayfield systems can pollute nearby waters through lagoon breaches and spills, lagoon leakage into shallow groundwater, sprayfield runoff from over-applied waste or waste applied on saturated or frozen ground, waste directly applied into ditches, and waste blown into surface waters or neighboring homes during waste application.
>
> c. Air pollution from swine facilities adversely affects neighboring communities and can spread antibiotic-resistant bacteria, threatening human health. DENR should consider requiring facilities to install controls on confinement houses that filter the air.
>
> d. Proximity to swine facilities depresses property values.

Response:
2.a. – The General Permits cover existing swine facilities and existing operations that were previously permitted by the Division and are not portable; therefore, the renewal of

these General Permits does not cause additional impacts to communities. Since 1995, all new swine operations have been subject to the Swine Farm Siting Act (G.S. §106-800) which establishes limitations on the siting of swine houses for permitted swine operations. In 2007, G.S. §143-215.10I made permanent the moratorium on the construction of new swine operations or the expansion of existing swine operations that employ a lagoon-sprayfield system as the primary method of waste treatment and disposal. Any new or expanding facilities permitted after that time must satisfy the Performance Standards for New/Expanding Swine Operation (G.S. §143-215.10I and 15A NCAC 02T .1307-1309 and 15A NCAC 02D .1808).

2.b. – There are statutes, rules, and permit conditions that address each of the concerns that were raised. Examples include the following:

- *Lagoon breaches and spills are prohibited under the General Permits. Permit Conditions I.1, II.1, II11-15, II.25, II.27, III.1-3, III.18, IV.1, and V.2 all directly address issues to prevent lagoon breaches and spills.*
- *Permitted lagoons are required to meet the current NC NRCS Conservation Practice Standard No. 359 – Waste Treatment Lagoon at the time of construction. Earthen structures for new/expanding swine operations must be designed and constructed with synthetic liners to eliminate seepage, 15A NCAC 02T .1307(1)(A).*
- *Permit Condition II.5 prohibits waste application at rates resulting in excessive ponding or any runoff.*
- *Condition II.21 prohibits the application of waste on saturated or frozen ground.*
- *The General Permits do not allow for discharges to ditches. Condition II.1 prohibits waste being directly applied to ditches.*
- *Condition II.19 prohibits waste from being applied such that it reaches surface waters or wetlands or crosses property lines or field boundaries.*

The Division conducts inspections of all permitted animal operations annually to determine if the system is in compliance with its animal waste management plan and Permit as required by G.S. §143-215.10F. The Division may also conduct sampling to determine if there are any violations of water quality standards.

2.c. – Permittees are required by G.S. §143-215.10C(e)(1) to develop and follow and Odor Control Checklist to reduce off-site odor impacts as a part of the CAWMP. Odor complaints related to animal operations are forwarded to and assessed by the Division of Air Quality. Site specific measures may be required based upon the findings of the Division of Air Quality. Some swine operations are voluntarily making modifications that improve air quality such as installing lagoon covers for methane capture and energy generation.

2.d. – The General Permits cover existing swine facilities. Since 1995, all new swine operations have been subject to the Swine Farm Siting Act (G.S. §106-800) which establishes limitations on the siting of swine houses for permitted swine operations including setbacks to occupied residences, schools, hospitals, churches, outdoor recreational facilities, national parks, State Parks, historic properties acquired by the state, child care centers, property boundaries, and wells.

3. Condition I.1 – This condition does not protect against discharges. The 25-year/24-hour storm design standard is not as protective against discharge as it may have been in the past. The last paragraph of this condition appears to allow waste discharges to or from ditches. DENR should prohibit any discharge of waste from or application of waste to a ditch that drains to surface waters or wetlands.

Response: G.S. §143-215.10C(b) states that animal waste management systems shall be designed, constructed, and operated so that the system does not cause pollution in waters of the State except as may result due to a storm event more severe than the 25-year, 24-hour storm. The structures were required to be designed based upon the NRCS Standard in place at the time of construction. There is no requirement to modify structure design.

The Condition does not allow for the discharge or application of waste to ditches and further prohibits the discharge to surface waters or wetlands. The exception described in the last paragraph requires that discharges from the ditch be controlled by approved best management practices (BMPs); this refers to the hydrologic flow leaving the ditch, not a release of pollutants. However, should any waste reach the ditch, it is required to be removed immediately, and must be reported as a discharge to a ditch.

4. Condition I.3 – DENR should require assessments of the effectiveness of the Certified Animal Waste Management Plan (CAWMP) to be submitted quarterly or with the annual certification. These assessments should be made public. DENR should require permittees to submit all amendments to the CAWMP to the Division for approval.

Response: The records associated with assessment of the CAWMP's effectiveness are maintained as part of the facility's records and are reviewed by the Division during annual compliance inspections. These records include but are not limited to lagoon level records, irrigation records, rainfall records, soil sample analysis, waste analysis, and crop yield records. Records are maintained by the Permittee for a minimum of three years, per Condition III.11, and must be submitted to the Division upon request.

5. Condition I.5 – The Division should require all facilities in all watersheds to submit facility wide evaluations for phosphorous loss at least every three years. General permits should prohibit all facilities from applying waste on fields at rates that exceed the established crop removal rate for phosphorous, not just those with "HIGH" phosphorous-loss assessment rating.

Response: 15A NCAC 02T. 1304 specifically exempts State Permitted facilities from phosphorus requirements. However, facilities in watersheds that are sensitive to nutrient enrichment can be required to conduct phosphorus evaluations through 15A NCAC 02B.

G.S. §143-215.10C(e)(6) establishes that nitrogen shall be a rate limiting element and that phosphorous application comply with the nutrient management standard. NC manure nutrient application criteria as related to phosphorous-loss assessments are established by NC NRCS Conservation Practice Standard No. 590 – Nutrient Management which is the state technical standard for nutrient management.

6. Condition I.6 – DENR should define the term "treatment units," and clarify that permittees may not circumvent the state law barring 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.

Response: The addition of definitions involves rule changes and is not within the scope of this permit renewal process. The addition of treatment units refers to supplemental treatment processes in conjunction with the current treatment system, i.e. a solids separation unit. The Condition specifically requires Division approval for use.
Condition I.4 specifically prohibits any expansion without meeting the requirements of the Performance Standards for New/Expanding Swine Operation (G.S. §143-215.10.I).

7. Condition I.7 – The permit should define the term "innovative treatment process" and clarify that permittees may not circumvent the state law barring 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.

Response: The addition of definitions involves rule changes and is not within the scope of this permit renewal process.

Condition I.4 specifically prohibits any expansion without meeting the requirements of the Performance Standards for New/Expanding Swine Operation (G.S. §143-215.10.I). The pilot testing of an innovative treatment process does not supersede this requirement.

8. Condition I.8 – The permit should increase the setback for private wells to at least 500 feet, impose setback for public or community wells of at least 1,000 feet, and impose setback to protect waters that have high recreational use as well as designated high quality waters.

Response: This issue is addressed in the response to Oral Comment 4.

9. Condition II.7 – This condition should be amended to require manure and sludge to be incorporated into the soil within twelve hours of application to bare soils.

Response: The Division feels that the requirement for sludge applied to bare fields be incorporated before the next rain event, in addition to the current two-day maximum is appropriate. The two-day maximum is consistent with the Ninth Senate Bill 1217 Interagency Group Guidance Document, Sept. 2009.

10. Condition II.10 – DENR should ensure that the North Carolina Department of Agriculture and Consumer Services (NCDA&CS) Veterinary Division's statutes and regulations protect the environment and promulgate additional regulations if needed. The permit should define "normal mortality rates" for each facility and require reporting of all die-offs in excess of those rates within 24 hours. Permittees should consult with the Division about appropriate burial locations

along with the dates and number of animals buried by species and type. The Division should also require groundwater monitoring for each burial site.

Response: It is outside of the purview of the Division to revise or promulgate new regulations that are under the authority of the NCDA&CS Veterinary Division granted by General Statutes Chapter 106, Article 34.

G.S. §143-215.10C(e)(3) requires Permittees to develop a mortality management plan as a part of their CAWMP. Permittees are further required to maintain stocking (and mortality) records. Division Staff does not recommend a 24-hour reporting requirement.

This Condition does require that burial be done in consultation NCDA&CS Veterinary Division, that the location be mapped, and that map provided to the Division along with records of dates and numbers of animals buried by species and type. The Condition also provides for groundwater monitoring as determined by the Division.

11. Condition II.12 – Permit should specify that the protective vegetative cover must be designed to prevent the berms and embankments from eroding.

Response: The purpose of a protective cover is the prevention of erosion. The maintenance of this protective cover and the condition of embankments, berms, pipe runs, and diversions are a part of the annual inspection that the Division conducts as required by G.S. §143-215.10F. Staff does not recommend any changes to the Permit language.

12. Condition II.17 – The permit should not incorporate an open-ended affirmative defense to potentially dangerous discharges. The permit should define circumstances that are considered "beyond the Permittee's control" to not include preventable accidents or operator error.

Response: The Division feels that the affirmative defense provision is appropriate. There are very few situations where an operator would be unable to perform the 120-minute inspection, and claim this provision. The Division does have the authority to refute the affirmative defense assertion if necessary.

13. Condition II.22 – This condition should be strengthened to require land application cease at least twenty-four hours before National Weather Service predicts, with 80% certainty, that there will be two inches or more of rainfall in the county in which the facility is located. Permit should also prohibit land application for at least twenty-four hours after rainfall of two inches or more.

Recommends a twenty-four hour cessation period prior to a tropical storm or hurricane; the current four hour cessation period does not give waste time to incorporate into soil.
Response: The Condition requires Permittee to consider pending weather conditions when making decisions regarding land application of waste and to record the weather conditions. Forecasts of rainfall of two inches or more as well as the timing would need

to be considered. The Division does not recommend language changes regarding cessation of waste application prior to storm events.

In actual practice, field conditions in the twenty-four hours following a two inch rainfall event typically prohibit the application of waste; the ground is often too wet for equipment to cross the field. Additionally, Condition II.21 prohibits application of waste on flooded or saturated land, and Condition II.5 prohibits application that results in excessive ponding or runoff. Based upon these permit conditions, the Division does not recommend any language changes regarding a twenty-four hour prohibition of application of waste following a rainfall of two inches or more.

The Condition requires application of waste cease within four hours of the National Weather Service (NWS) issuance of Hurricane/Tropical Storm Warnings or Flood Watch associated with a Hurricane/Tropical Storm. The NWS issues these watches and warnings twenty-four hours prior to the storm event. The four hour window after issuance of said watches/warnings provides operators time to receive notification and cease waste application. This also allows at least twenty hours for the waste to incorporate into the soil.

14. Condition II.24 – Calibration should be required at least once every six months and results of testing submitted to Division.

Response: The Division feels that the current calibration frequency is appropriate. This issue is further addressed in the response to Oral Comment 1.

15. Condition II.26 – Permit should prohibit the storage of crops in bales around the exterior of sprayfields/crop fields.

Response: The storage of hay bales on field edges is a common agricultural practice not exclusive to waste application fields. The inspection process also addresses any situation when bales are not being utilized or removed. Division Staff does not recommend any language change.

16. Condition II.27 – Permit should require the Division approval prior to lowering lagoon levels below designed stop pump levels and should clarify that this does not override Condition II.22.

Response: Division notification is not necessary. Provisions for temporary lowering of lagoon levels below stop pump levels are in the NC NRCS Conservation Practice Standard No. 359 – Waste Treatment Lagoon, the state technical standard.

17. Condition III.1 – DENR should provide Permittees guidance on how to inspect lagoons, require broader installation and use of monitoring wells or an evaporation pan to determine lagoon seepage loss, or require third party testing for lagoon seepage.

Response: Permittees are required to do a visual inspection to look for signs of erosion, leakage, damage or discharges as a part of their monthly inspection. Division staff also inspects the embankments during the annual inspection process. The inspector informs the Permittee of any areas of concern and recommends corrective actions. Technical assistance from NRCS or private consultants is available to advise Permittees on addressing such issues.
Monitoring wells may be required as determined by the Division, per Condition III.10. Division Staff does not recommend any changes to the Permit language.

18. Condition III.5 – Waste sample analysis should be required prior to application, not 60 days before or after application.

Response: This issue is addressed in the response to Oral Comment 6.

19. Condition III.9(f) – Sampling of source lagoon/storage pond should be required within twelve hours. Sampling of water receiving the discharge should also be sampled for the parameters listed within twelve hours. Sample handling practices should be specified, and samples taken to a certified laboratory. Monitoring results should be submitted within fifteen days and made public, rather than within thirty days.

Response: This issue is addressed in the response to Oral Comment 7.
Thirty days is appropriate to obtain and submit sampling data. All reports received by the Division are public record.

20. Condition III.11 – Records retention should be for five years not three years. Once every five years DENR should conduct a full compliance inspection of the facility and records.

Response: The Division conducts a full compliance inspection annually for each facility covered under these General Permits as required by G.S. §143-215.10F. All records within the required retention schedule must be made available during the inspection or submitted upon request, per Condition III.12. Division staff does not recommend any changes to the current retention schedule.

21. Condition III.14 – All permittees should be required to file an annual compliance report regardless of compliance history.

Response: The Division conducts inspections of all permitted animal operations annually as required by G.S. §143-215.10F. All records required by this Permit are reviewed by the Division during the inspection. Condition III.12 further requires the Permittee to submit any records or reports within fifteen days of request by the Division. This Condition reserves the right for the Division to require an annual report.

22. Condition III.15 to III.17 – Terminology should be consistent across these three conditions and tie to the discharge of waste. Press release requirement in Condition III.15 should be within twenty-four hours and specify contents of the press release. Condition III.17 should be made clear that discharges of 1,000,000 gallons or more require press release and public notice be expanded to included appropriate counties recommended by the Division. Permittees should be required to contact the Division within twelve hours of a discharge of 5,000 gallons or more. Permittees should be required to maintain a copy of the press release and public notice for up to one year and to provide the Division with a copy of the notice and proof of publication.

Response: The Division agrees that the terminology should be consistent across the three Conditions. It is recommended that all three Conditions use the term "animal waste"; this is also consistent with G.S. §143-215.10C(h).

The requirement to issue a press release within forty-eight hours of a discharge of 1,000 gallons or more of animal waste to surface waters of the State is a requirement of G.S. §143-215.10C(h)(1) and cannot be changed by this process.

The requirement to publish a notice of the discharge of 15,000 gallons or more of animal waste to surface waters of the State is a requirement of G.S. §143-215.10C(h)(2) and cannot be changed by this process. The publication of a public notice is in addition to the above press release requirement.

It is recommended to add the following two sentences from G.S. §143-215.10C(h)(2) be added to Condition III.16 – "The notice shall be captioned "NOTICE OF DISCHARGE OF ANIMAL WASTE" and "The owner or operator shall file a copy of the notice and proof of publication with the Department within thirty (30) days after the notice is published. Publication of a notice of discharge under this Condition is in addition to the requirement to issue a press release under Condition III.15".

It is recommended to correct the last sentence in Condition III.17 to say "A copy of all public notices and proof of publication must be sent to the Division within thirty (30) days of the after the notice is published."

23. Condition III.18 – Two years is too long for a facility to comply with sludge removal. Compliance should be within one year, rather than two. Facilities that are not able to manage its waste should not be allowed to generate more.

Response: The Division feels that the compliance schedule is appropriate as written. Permittees must identify additional application fields and comply with the application windows for various crops. The Condition does require a Plan of Action be developed within ninety days of determination of the need or sludge removal.

24. Condition IV.1 – Permit should state that facilities are subject to random, unannounced inspections.

Response: The Condition does not preclude random, unannounced inspections. The Division feels that the current wording is appropriate.

25. Condition V.13 – Permit should provide requirements for how systems are to be closed. Depopulated facilities should be required to maintain a permit and inspect the lagoon to ensure it is not leaking. Reopening facilities should have to demonstrate compliance with performance standards in G.S. 143-215.10I. Facilities depopulated due to forced closure or enforcement should develop a plan that rectifies past violations.

Response: Abandoned facilities are held to the conditions of this Permit until lagoon closure. As for the issue of reactivation of abandoned farms, that is addressed by 115A NCAC 02T .1302. Lagoon closure is addressed in Condition V.3, 15A NCAC 02T .1306, and NC NRCS Conservation Practice Standard No. 360 "Closure of Waste Impoundment."

26. Information Collection – Permits should be revised to require all information collected be submitted to DENR quarterly and made readily accessible to the public via a database.

Response: The Division conducts inspections of all permitted animal operations annually as required by G.S. §143-215.10F. All records required by this Permit must be submitted to the Division during the inspection for review. Condition III.12 further requires the Permittee to submit any records or reports within fifteen days of request by the Division. This Condition reserves the right for the Division to require an annual report.

27. DENR should require dry litter poultry facilities to operate under a permitting program. DENR should repeal the permitting by regulation rules applicable to dry litter poultry facilities. At a minimum, facilities that violate the regulations for deemed permitted status to obtain coverage under an individual or general permit.

Response: The General Permits presented for public review and comment are renewals of existing general permits. The introduction of a new general permit for a permitted activity should be addressed in a separate action. At this time, the Division has not received any requests for permit coverage from a dry litter poultry operation. If such a request is received, an individual permit can be issued in compliance with all applicable statutes and regulations. A general permit could be developed if multiple dry litter poultry facilities seek coverage.