



Demonstration projects of animal mortality burial indicate that ground water contamination occurs and is not the correct solution for managing animal mortalities. Composting, rendering or incineration are the common and appropriate practices. (Malone, G., W., 2003. Shallow trench burial demo. University of Delaware Research and Education Center.)

for expanded nutrient management planning practices. These practices affect 22,358 acres and include practices such as phosphorus site indexing, precision soil sampling, precision record keeping, controlled release fertilizer use and others.

Public Nutrient Consultants also help with the workload of developing plans. During 2005, Kent and Sussex Conservation Districts made available seven certified public consultants for the development of animal waste management plans and/or nutrient management plans. The Department of Natural Resources and Environmental Control (DNREC) obligates annually \$265,555 of section 319 Clean Water Act funds for the cost of eight conservation

and nutrient management planners (NPS Annual Report, 2004). The University of Delaware Extension Services also assist farmers in developing nutrient management plans. As summarized, there are many private and public organizations that provide the resources needed to implement the Nutrient Management Law.

Nutrient Management Implementation goes beyond the development of a plan and depends on a wide array of Federal, State and local resources. In general, implementation costs are for manure handling structures and in-field conservation practices that protect and conserve the environment. The funding sources follow and reflect expenditures and or obligations for FY 2005:

1. Federal funds from NRCS: \$3,308,272 for structures and conservation practices such as manure management, mortality management, heavy use protection, cover crops, vegetative buffers, environmental windbreaks, and other practices
2. State funds from DNREC: \$1,705,000 for structures such as manure management, mortality management and cover crops.
3. State funds from the Commission: \$546,000 for poultry litter relocation.



Proper nutrient management is important for all nutrient handlers, including lawn care companies.

Nutrient Management Plan Audits

A fraction of all nutrient management plans developed and reported to the Commission are audited to instill high standards for those operations requiring nutrient management. The Commission's goal is to audit 10% of nutrient management plans developed each year. This process helps to ensure that plans are meeting the requirements of the law and that they are being utilized. During 2005, program staff audited nutrient management plans for 15 agricultural operations and 3 non-agricultural operations.

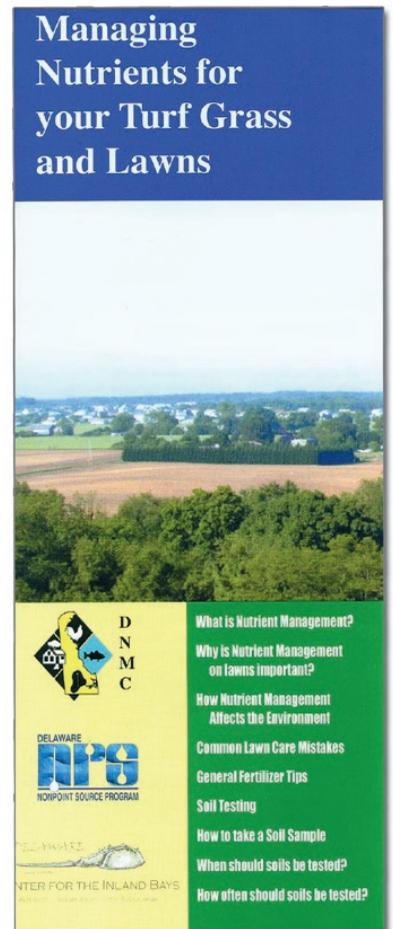
As a result of nutrient management audits all legal discrepancies identified involved a follow up meeting with farm management and in many cases the certified nutrient consultant. The common discrepancy was incomplete recordkeeping. As a result of the 2005 audits, all discrepancies were disclosed and resolved except for one case where a nutrient handler was not certified. This case was eventually resolved after formal administrative actions.

Nutrient Management Financial Audits

To insure integrity in the use of public funds, program staff completed eight financial audits of the total program distributions valued at \$997,800. Four audits were conducted on participants of the relocation program and four on the participants of the nutrient planning reimbursement funds. These audits demand proper accounting practices and will continue annually.

Urban Nutrient Management

In partnership with The Center for the Inland Bays and the 319 Delaware NonPoint Source Program, nearly 175,000 brochures were designed, printed and distributed over the past three years. The brochure targeted smaller properties in urban and suburban areas. *Managing Nutrients for your Turf Grass and Lawns* is a concise but informative brochure available to homeowners. Help from garden centers, fertilizer stores, University extension offices, other public offices and direct mailings contributed to this project, which started in 2003.

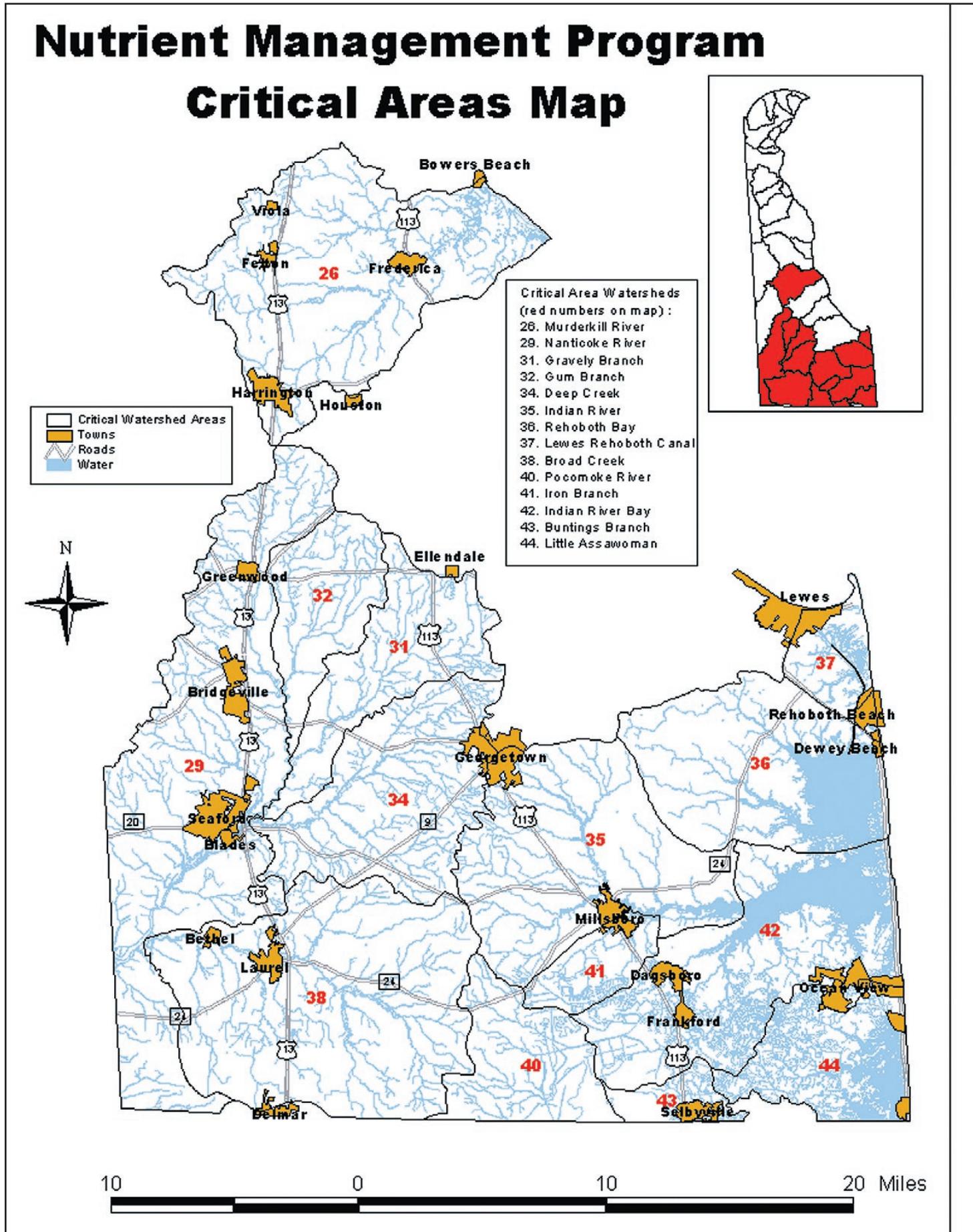


Nutrient management awareness and education is important for farmers, policy makers and the general public.

Nutrient Management Critical Areas

The Commission has established a “critical areas” map to help set priorities for the Nutrient Management Program. Such priorities include nutrient relocation involvement for the export of excess poultry litter.

These critical areas encompass most of Sussex County and a portion of Kent. They include the Inland Bays, Nanticoke, Pocomoke and the Murderkill watersheds. The Commission’s choices were based on the impaired-waters list developed by the Department of Natural Resources and Environmental Control, the level of livestock production within those watersheds and input from the Tributary Action Teams.



Nutrient management critical areas as established by the Delaware Nutrient Management Commission.

Permits for Certain Animal Operations

The Commission and Secretary of Agriculture continue to take an active role in addressing national pollution permit regulations for Delaware animal feeding operations. The 1972 Clean Water Act and 2003 Federal regulations require permits for some farms called Concentrated Animal Feeding Operations (CAFOs).

The Nutrient Management Law and a current agreement between the Environmental Protection Agency (EPA), DNREC, Department of Agriculture (DDA) and the Commission have authorized the Nutrient Management Program to implement regulations for CAFOs. This agreement outlines responsibilities for each agency. Such responsibilities

include the Nutrient Management Program as the initial enforcement effort for all CAFOs prior to actions from DNREC and or EPA.

Delaware CAFO regulations were presented to the agricultural community during the summer of 2005 and later became effective September 12, 2005. These regulations were the result of a culmination of efforts that started in 2001. All policy decisions were conducted in a public forum of the Commission and recommended to the Secretary of Agriculture and the Secretary of Natural Resources and Environmental Control. Major contributors to the process include DNREC Water Resources, Natural Resources Conservation Service, University of Delaware and several interest groups representing agriculture and environmental conservation.

A CAFO permit is required when a farm experiences a discharge to the environment. The CAFO requirements are activated when a farm owner and manager sign and submit a Notice of Intent (NOI) to comply with regulations that prohibit a discharge. Portions of the nutrient management plan must accompany the NOI. In general, a discharge occurs when animal manure is not stored and/or handled correctly or when manure is over applied as defined by the nutrient management plan. Animal operations may also voluntarily sign a NOI, as some have, for the legal protection that demonstrates no-discharge on that particular farm.

During 2005, the following animal feeding operations were managed according to the requirements of the CAFO regulation:

CAFO Name	Animal Type	Operation Capacity	Town
Schiff Farms Inc.	Feeder Beef	4,000	Whitleysburg
Delaware Park	Competition Horses	1,500	Wilmington

In conclusion, a Federal permit may be requested or required by an animal feeding operation. A permit requires the farm operation to prevent any discharge to the environment under weather condition less severe than a 25 year rain event, or approximately 6.3 inches of rain within a 24 hour period. A nutrient management plan, records of implementation, annual report, certification and other details are required by the permit.

Best Management Practices

The Nutrient Management Commission promotes best management practices, which are actions that can help reduce nutrient runoff. These management practices are the backbone of nutrient management and will have short-term and long-term results on water quality. They include such practices as proper soil and manure sampling, proper timing and methods of fertilizer (commercial and manure) application, manure handling and proper storage, the planting of cover crops and vegetative buffer strips near sensitive areas, erosion control, the proper disposal of dead animals and general conservation practices.

County-by-County Report

The Commission works cooperatively with county conservation districts to promote and implement nutrient related best management practices. Many practices that are coordinated by the Conservation Districts result in success that helps both the environment and the farmer. Kent and Sussex Conservation District offices staff a total of seven Conservation Planners who work with nutrient handlers. They develop nutrient management plans (see nutrient management planning in this report) and address many other conservation practices for farmers and property owners. The following is a 2005 summary of the Districts accomplishments:

New Castle County

Manure storage structures - 2
 Acres planted with cover crop - 3,355
 Poultry carcass composters - 1
 Conservation plan development acres - 14,090

Kent County

Manure storage structures - 14
 Poultry carcass composters - 8
 Acres planted with cover crop - 6,842
 Pre-sidedress soil nitrate test - 61 samples representing 1,905 acres
 Conservation plan development acres - 24,157

Sussex County

Manure storage structures - 5
 Poultry carcass composters - 22
 Acres planted with cover crop - 34,999
 Pre-sidedress soil nitrate test - 124 samples representing 5,551 acres
 Conservation plan development acres - 9,683

In conjunction with county and federal Conservation District offices, the Commission developed a *Nutrient Management Best Management Practices* source book, which provides nutrient handlers a list of recommended practices. These practices will be part of nutrient management planning that will help reduce nutrient pollution.

The source book has been distributed to all certification participants and provides a detailed explanation of 56 practices. The following practices represent a summary of the Commission approved best management practices that can also be found on the website:

- Poultry Feed Related Amendments such as Phytase that make nutrients such as phosphorus more available during digestion and so reduce Phosphorus in manure.
- Poultry Litter Amendments such as Alum that when added binds soluble Phosphorus in litter and reduces odor and ammonia emissions.
- Roof Runoff Management in Feedlots that prevents clean water from coming into contact with animals or manure.
- Storm Water Control in Feedlots that prevents clean storm water from becoming contaminated by flowing through feedlot and coming into contact with animals or manure.
- Temporary storage of poultry litter must be managed and handled to best protect the environment and provide operational flexibility.
- Pasture Stream Fencing to act as a barrier between pastureland and a watercourse to exclude animals from ditches and streams.
- Liquid and Non-Liquid Manure Handling for Long-term and Short-term storage ranging from temporary field storage of dry manure to systems for the collection, transportation, storage, and disposal of liquid manure and contaminated runoff in a manner which does not degrade air, soil, or water resources.
- Animal Mortality Handling can range from a composting facility for the biological treatment of daily accumulation of dead animals to composting methods to deal with large scale catastrophic mortality.
- Analysis and Testing of soil, manure and plant tissue are valuable tools for determining available nutrients in each of these components.
- Phosphorus Management such as conducting phosphorus site index, saturation ratio and feed management.
- Nutrient Application Equipment Calibration and Adjustment are necessary to ensure nutrients are applied evenly and at known rates to avoid over application.
- Residue Management and Tillage Practices can contribute to improved water quality while reducing soil erosion, increasing infiltration and organic matter, improving soil structure, and reducing compaction and crusting.
- Sustainable pasture management maintains vegetative growth with a balanced animal density to protect the soil and prevent nutrient and manure runoff.
- Conservation practices for drainage ditches and other water bodies to prevent nutrient runoff.

Stockpiling and Temporary Field Storage of Poultry Litter Standards

The following best management practices reference temporary storage of poultry litter that affect all poultry operations and anyone utilizing poultry litter.

The most efficient method of handling and storing poultry litter results from handling the poultry litter as few times as possible. Ideally, total cleanouts and crust outs are immediately land-applied, transported to an alternative use or to a storage structure. However, timing considerations may require temporary outdoor storage of the litter before use, which must be conducted while implementing best management practices.

In situations where temporary field storage is needed, litter may be stored temporarily to preserve litter quality and prevent application at the wrong time of the year. Temporary field storage is the least preferred storage practice but may be conducted according to the following standards:

Stockpiling and Temporary Field Storage of Poultry Litter Standards

Production Area Storage	Non-Production Area Storage Up to 90 Days	Non-Production Area Storage Over 90 Days to 150 Days
<p>“Production Area” means that part of an Animal Feeding Operation that includes the animal confinement area, the manure storage area, the raw materials storage area and the waste containment areas, also includes egg washing or processing facility and any area used in the storage, handling, treatment or disposal of mortalities. The Production Area should be defined in the operation’s Nutrient Management Plan.</p>	<p>Temporary Field Storage away from the “Production Area” can be staged for land application and is limited to 90 days without the use of an impervious cover.</p>	<p>For conditions that require temporary storage of litter beyond 90 days, individual or general authorization may be granted by the DNMC or Delaware Department of Agriculture for storage up to 150 days. For any storage greater than 150 days, an impervious cover is required.</p>
<p>Stockpiling storage within the “Production Area” (as defined above) is limited to 14 days without the use of an impervious cover.</p>		
<p>The following BMP(s) are required for Production Area Storage:</p> <ol style="list-style-type: none"> 1. The stockpile must be separated from any channeled runoff, standing water and other drainage systems such as roof runoff and down spouts. <p>These following additional BMPs are required for Production Area Storage of 2-14 days:</p> <ol style="list-style-type: none"> 2. The stockpile must be at least 6 feet high; and 3. The stockpile site must meet Natural Resources Conservation Service (NRCS) standard or other containment area lining (standards) approved by the DNMC. 	<p>The following BMPs are required for Non-Production Area Storage Up to 90 days:</p> <ol style="list-style-type: none"> 1. The pile must be at least 6 feet high and in a conical cross section shape; and 2. Litter shall not consist of more than 5% crust out material; and 3. The selection of the temporary storage site must consider the highest, most practical site possible and shall not use the same site more than once every two years without a storage site that meets NRCS standards or other containment lining standards approved by the DNMC; and 4. The temporary storage sites must be identified in the nutrient management plan; and 5. The site must be located at least 100 feet from a public road, 100 feet from any surface water and 200 feet from any residence not located on the property; and 6. The site must be at least 200 feet from a domestic well and 300 feet from a public water supply well; and 7. Post litter removal treatment must include the removal of all litter and the top 1-2 inches of topsoil if the topsoil is co-mingled with the litter to prevent nutrient loads; and 8. A production crop or cover must be established and maintained at the site as soon as practical following post removal treatment. 9. For temporary storage sites on soils classified as located within 1.5 feet of the depth to the seasonal high water table, any one of the following practices must be implemented: <ol style="list-style-type: none"> a. The establishment of a storage site that meets NRCS standards or other containment lining standards approved by the DNMC; or b. The use of high carbon (content) material (straw, wood shavings, fodder) as the base of the pile at least 8 inches thick to serve as a barrier and easy post storage removal; or c. The use of powdered bentonite or similar material that will seal the area under the pile. 	<p>The following BMPs are required for Non-Production Area Storage Over 90 days:</p> <ol style="list-style-type: none"> 1. The pile is to be constructed as large as possible and be at least 10 feet high and in a conical cross section shape; and 2. Litter shall not consist of more than 5% crust out material; and 3. The selection of the temporary storage site must consider the highest, most practical site possible and shall not use the same site more than once every two years without a storage site that meets NRCS standards or other containment lining standards approved by the DNMC; and 4. The temporary storage sites must be identified in the nutrient management plan; and 5. The site must be located at least 100 feet from a public road, 100 hundred feet from any surface water and 200 feet from any residence not located on the property; and 6. The site must be at least 200 feet from a domestic well and 300 feet from a public water supply well; and 7. Post litter removal treatment must include the removal of all litter and the top 1-2 inches of topsoil if the topsoil is co-mingled with the litter to prevent nutrient loads; and 8. A production crop or cover crop must be established and maintained at the site as soon as practical following post removal treatment; and 9. A 24-foot vegetative crop must be planted and maintained surrounding the pile. 10. For temporary storage sites on soils classified as located within 1.5 feet of the depth to the seasonal high water table, any one of the following practices must be implemented: <ol style="list-style-type: none"> a. The establishment of a storage site that meets NRCS standards or other containment lining standards approved by the DNMC; or b. The use of high carbon (content) material (straw, wood shavings, fodder) as the base of the pile at least 8 inches thick to serve as a barrier and easy post storage removal; or c. The use of powdered bentonite or similar material that will seal the area under the pile.