

**Joint Legislative Audit and Review Commission
of the Virginia General Assembly**



**Review of Nutrient Management
Planning in Virginia**

**JLARC Staff Briefing
Eric H. Messick
November 8, 2004**

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Presentation Outline

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- Introduction
- Background
- Nutrient Management Plans for Agricultural Land
- Virginia's Poultry Waste Transfer and Alternative Uses Program
- Use of Nutrient Management Planning Outside of Farmland and on State Lands
- State Policy Options

Study Mandate

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- **House Joint Resolution 72 (2004) directs JLARC to study the effectiveness of the implementation, performance, and enforcement of Virginia's nutrient management plans**

- **The resolution specifically directs staff to evaluate:**
 - **The current level of participation, compliance, and enforcement of the nutrient management planning program,**
 - **The adequacy of the record-keeping requirements for animal waste disposal and transfer activities,**
 - **The need for, use, and implementation of nutrient management plans by State entities, and in urban and rural settings, and**
 - **As applicable, examples of effective nutrient management planning in Virginia and elsewhere**

Study Issues

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- **To what extent is land in Virginia administered under a nutrient management plan?**
- **For nutrient management plans that have been developed for agricultural lands in Virginia:**
 - **What is the general quality of these plans?**
 - **For those plans that are required under State law, to what extent are they being properly implemented and complied with?**
 - **Has the State effectively enforced the requirements of its nutrient management planning program with regard to these plans?**
 - **To what extent are NMPs written for voluntary purposes being implemented and followed?**
- **Are the record-keeping requirements for data on animal waste disposal and transfers adequate to ensure compliance with the *Code of Virginia*?**

Study Issues

(continued)

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- **To what extent did the State's poultry litter transfer pilot program effectively move poultry litter out of the areas in Virginia with high poultry production?**
- **What, if any, alternatives uses for animal and poultry wastes are currently in use in Virginia or have been developed?**
- **To what extent do State agencies and institutions currently manage State-owned lands and projects in accordance with nutrient management plans?**
- **How has Virginia addressed nutrient management issues associated with urban and rural environments?**
- **What alternatives are available that might increase the amount of acreage for which nutrient management plans are implemented?**

Research Activities

- **Structured interviews with:**
 - **Staff of the Departments of Conservation and Recreation (DCR) and the Department of Environmental Quality (DEQ)**
 - **Representatives from the Virginia Farm Bureau, Virginia Poultry Federation, Virginia State Dairyman's Association, and the Chesapeake Bay Foundation**
 - **Staff of the Chesapeake Bay Program, United States Department of Agriculture, National Resources Conservation Service, and United States Geological Service**
 - **Staff of the nutrient management programs in Delaware, Maryland, and Pennsylvania**
 - **Research staff at Virginia Tech and the University of Maryland**

- **Accompanied DEQ staff on six inspections of permitted animal and poultry feeding operations**

Research Activities

(continued)

- **Document collection and analysis of:**
 - 209 DEQ inspection reports prepared between 2001 and 2004 concerning regulated confined animal and poultry feeding operations
 - 50 nutrient management plans that were required under State-law and 25 voluntarily developed nutrient management plans
 - Virginia's 2004 proposed tributary strategies for meeting the *Chesapeake 2000* objectives

- **Mail surveys of:**
 - 1,650 farm operators in Virginia
 - All 14 DCR regional staff responsible for writing nutrient management plans
 - 230 other DCR-certified nutrient management planners
 - 47 agencies and institutions responsible for State-owned land

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NMPs Optimize Plant Nutrient Usage and Reduce Nonpoint Source Pollution

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- **According to DCR, a nutrient management plan:**

- Is a written site-specific plan which identifies how the major plant nutrients (nitrogen, phosphorus, and potassium) are to be annually managed for expected crop production and for the protection of water quality**

- **The goal of nutrient management planning on agricultural land as defined by DCR is to:**

- Minimize the adverse environmental effects, primarily upon water quality, and avoid unnecessary nutrient applications above the point where the long-run net farm financial returns are optimized**

- **Nutrient management planning seeks to address nonpoint source pollution by reducing the potential for runoff and leaching of nutrients**

Agricultural Activity in Virginia

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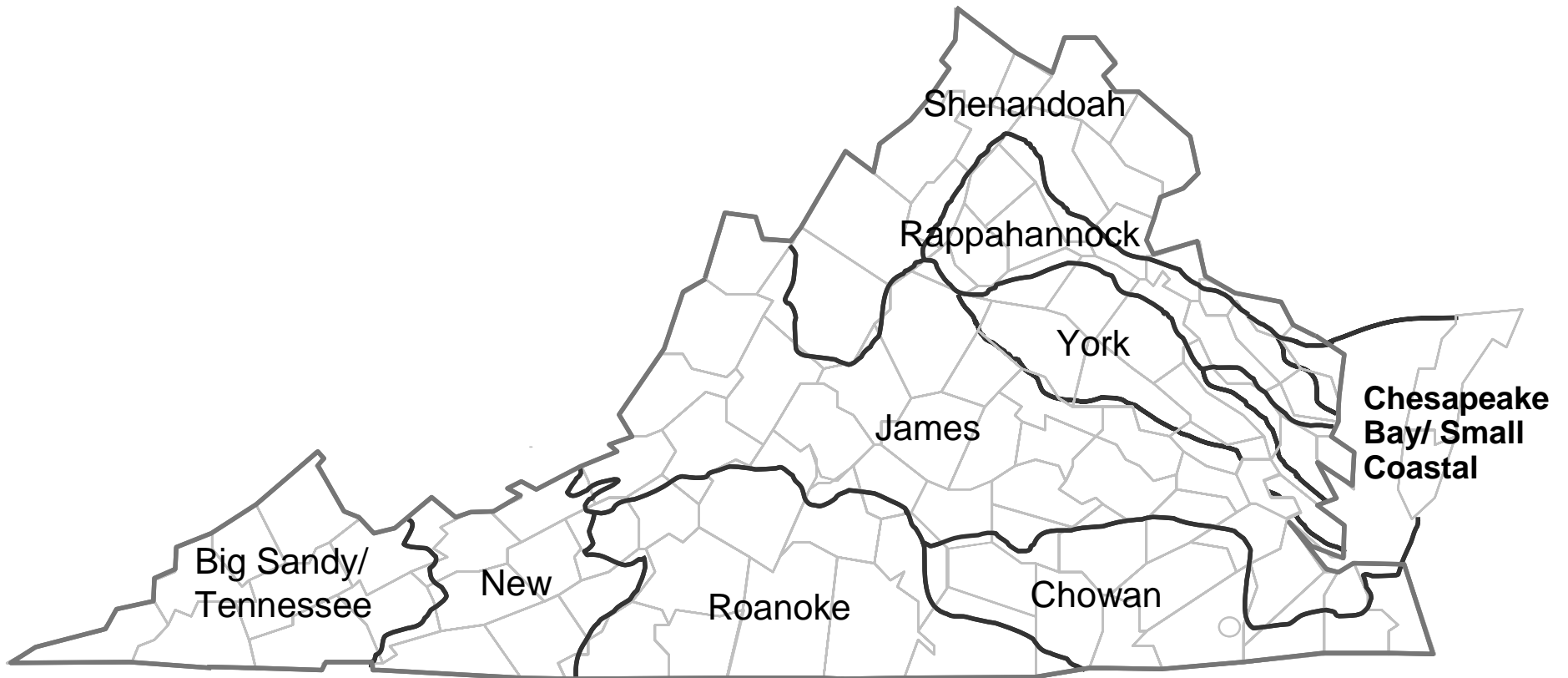
- **Agriculture accounts for about 24 percent of Virginia's land use**
- **In Virginia, there are more than 47,500 farming operations and more than 6 million acres of cropland and pastureland**
- **Agricultural commodities accounted for approximately \$2.2 billion in cash receipts for Virginia in 2003**
- **Nutrients are applied to crops to try and ensure strong yields**
- **In 1997, agricultural animal wastes and commercial fertilizer purchases accounted for about 438.8 million pounds of nitrogen and 127.5 million pounds of phosphorus**

Agricultural Effects on Water Quality




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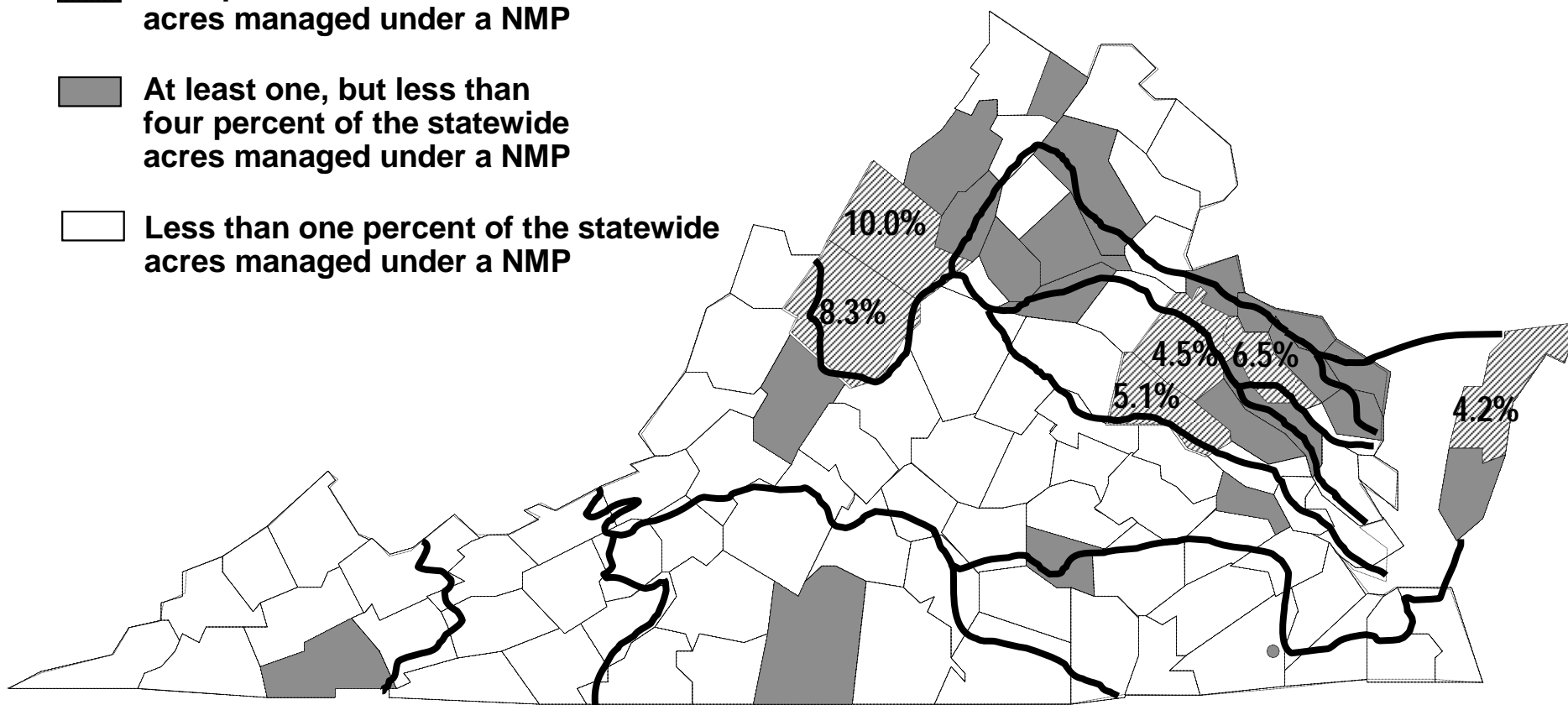
- **Nine major watersheds in Virginia contain more than 50,000 miles of rivers and streams as well as a large segment of the Chesapeake Bay**
- **According to the EPA, nonpoint source pollution is the nation's largest source of water quality impairment, affecting approximately 40 percent of the nation's surveyed rivers, lakes, and estuaries**
- **DCR computer-models have estimated that agricultural land accounts for 70 percent of the nitrogen and 60 percent of the phosphorus nonpoint source pollution in the Commonwealth**
- **Excessive quantities of nitrogen and phosphorus in water may result in:**
 - **Eutrophication**
 - **Dead-zones**

Virginia's River Basins



Almost 40 Percent of the 522,000 Planned Agricultural Acres Statewide Are Located in Six Counties*

-  Four percent or more of the statewide acres managed under a NMP
-  At least one, but less than four percent of the statewide acres managed under a NMP
-  Less than one percent of the statewide acres managed under a NMP



*Based on new or revised plans during 2001, 2002, and 2003.

Use of NMPs on Non-agricultural Land in Virginia

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- **More than 43,000 acres of urban land are also managed using nutrient management guidelines**
- **Another 32,000 acres of State-managed agricultural and non-agricultural lands are also administered using either a nutrient management plan or nutrient management guidelines**

Nutrient Management Planning Is Required by Certain State Policies

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- **The *Code of Virginia* requires confined animal and poultry feeding operations, meeting certain statutory criteria, to obtain a DCR-approved nutrient management plan prior to receiving a State operating permit**
- **Some agricultural activities that occur under the Chesapeake Bay Preservation Act also require the development of NMPs and their implementation under certain conditions**
- **Farmers participating in Virginia's Agricultural Best Management Practices Cost-Share Program may also be required to use NMPs**
- **Plans written by DCR-certified planners must adhere to the department's training and certification regulations**

DCR and DEQ Are Responsible for Nutrient Management Plan Oversight

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- **DCR is responsible for managing Virginia's nutrient management program**
 - **The 1994 General Assembly required DCR to develop standards for certification of nutrient management specialists in Virginia and also the content of nutrient management plans**
 - **DCR's training and certification regulations were promulgated in 1996 and are currently being updated by the department with the intention that they be finalized in spring 2005**

- **DEQ is responsible for inspecting the more than 1,000 permitted farming operations and enforcing the items in the Virginia Pollution Abatement General Permits for animals and poultry, including the nutrient management plan**

State Law and Regulations Specify Nutrient Management Plan Content

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- **NMPs written to obtain a VPG Permit for a confined animal or poultry feeding operation must contain a:**
 - Site map
 - Site evaluation and assessment of soil types and productivities
 - Nutrient management sampling including soil and waste monitoring
 - Storage and land area requirements
 - Calculation of land application rates, and
 - Waste application schedule

- **NMPs written for confined animal feeding operations must also include a plan for waste utilization in the event the operation is discontinued**

- **DCR's Training and Certification Regulations require that plans submitted by State-certified specialists must include the following four components:**
 - Plan identification section,
 - Map or aerial photograph section,
 - Field summary nutrient balance section, and
 - Narrative section

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Completeness of NMPs

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- JLARC staff reviewed 50 required NMPs and 25 voluntary NMPs for the completeness of the NMP
- For required NMPs, 47 of 1,300 items checked were missing (3.6 percent)
- For voluntary NMPs, 13 of 225 items checked were missing (5.8 percent)
- Of the missing items, the most frequently cited items were maps showing field numbers and acres, soil tests, and field productivity reports and yield ranges

Plans Do Not Appear to Be Written for Longer than Recommended

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- DCR's training and certification regulations recommend that plans written for cropland should be written for no more than three years, while sites in pasture or hay rotations should not be written for more than five years
- JLARC staff's review of 50 NMPs written for State-permitted confined animal and poultry feeding operations found that none of the plans were written for a period of time longer than that which was recommended

Permitted Deviations from NMP Recommendations Could Compromise Nutrient Reductions

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- **NMP fertilizer recommendations are based on Virginia Tech research**
- **NMP recommendations also contain a “buffer” amount for nitrogen above what crops need, to help ensure that average yields are obtained**
- **However, if all nutrient applications occur at the high end of the range, some of the potential reductions of the NMP will be lost**
- **In addition to the buffer, DCR regulations permit farmers to make upward adjustments to crop yields on as much as 20 percent of their fields based solely on “the farmer’s past experience with crop yields.” Adjustments to more than 20 percent of a farm’s fields require documentation of past yield records**

Permitted Deviations from NMP Recommendations Could Compromise Nutrient Reductions (continued)

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- **The Chesapeake Bay Program estimated in 2004 that, on average:**
 - **farms with NMPs are likely to apply nutrients at 1.35 times what the crops can use, and**
 - **farms without NMPs are likely to apply nutrients at 1.55 times what the crops can use**

- **This is a meaningful reduction in expected nutrient applications, but no reduction will actually occur if the buffers and permissible adjustments and deviations from basic crop recommendations are too great**

- **DCR needs to analyze a sample of NMPs to see if the plans are sufficiently stringent, and also reconsider the extent of permissible deviations under its regulations**

Recommendations

- **The Department of Conservation and Recreation, in conjunction with the Department of Environmental Quality, should analyze a sample of NMPs, to determine whether there is a need for greater stringency with regard to allowing adjustments to basic NMP recommendations**
- **The Department of Conservation and Recreation should reconsider the language in the training and certification regulations that permits farm operators to make upward adjustments to expected crop yields, and hence increase nutrient application rates, on up to 20 percent of a farm's fields based solely on personal experience. If the department wishes to continue providing farm operators this opportunity, it should consider limiting undocumented upward adjustments to field productivity in a more restrictive manner, such as limiting changes to a percentage of acreage or requiring that the plan identify the areas and describe the agricultural activities intended to take place there. Moreover, the department may want to consider requiring farmers to keep field productivity records**

Certain Confined Animal and Poultry Feeding Operations Require Permits

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- ***The Code of Virginia* was amended in 1994 to require confined animal feeding operations (CAFO) to obtain a general permit prior to commencing operations**
 - **The *Code of Virginia* defines a CAFO as a lot or facility, together with an animal waste lagoon or pit where (1) animals will be confined and fed for a total of 45 days or more in any 12-month period, and (2) crops or other vegetation are not sustained on the operation's lot or facility**

- **Statutory language was added in 1999 requiring confined poultry operations to obtain similar general permits**
 - **The *Code of Virginia* defines a confined poultry feeding operation as a CAFO with 200 or more animal units of poultry**

Confined Animal Feeding Operation

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Confined Poultry Feeding Operation

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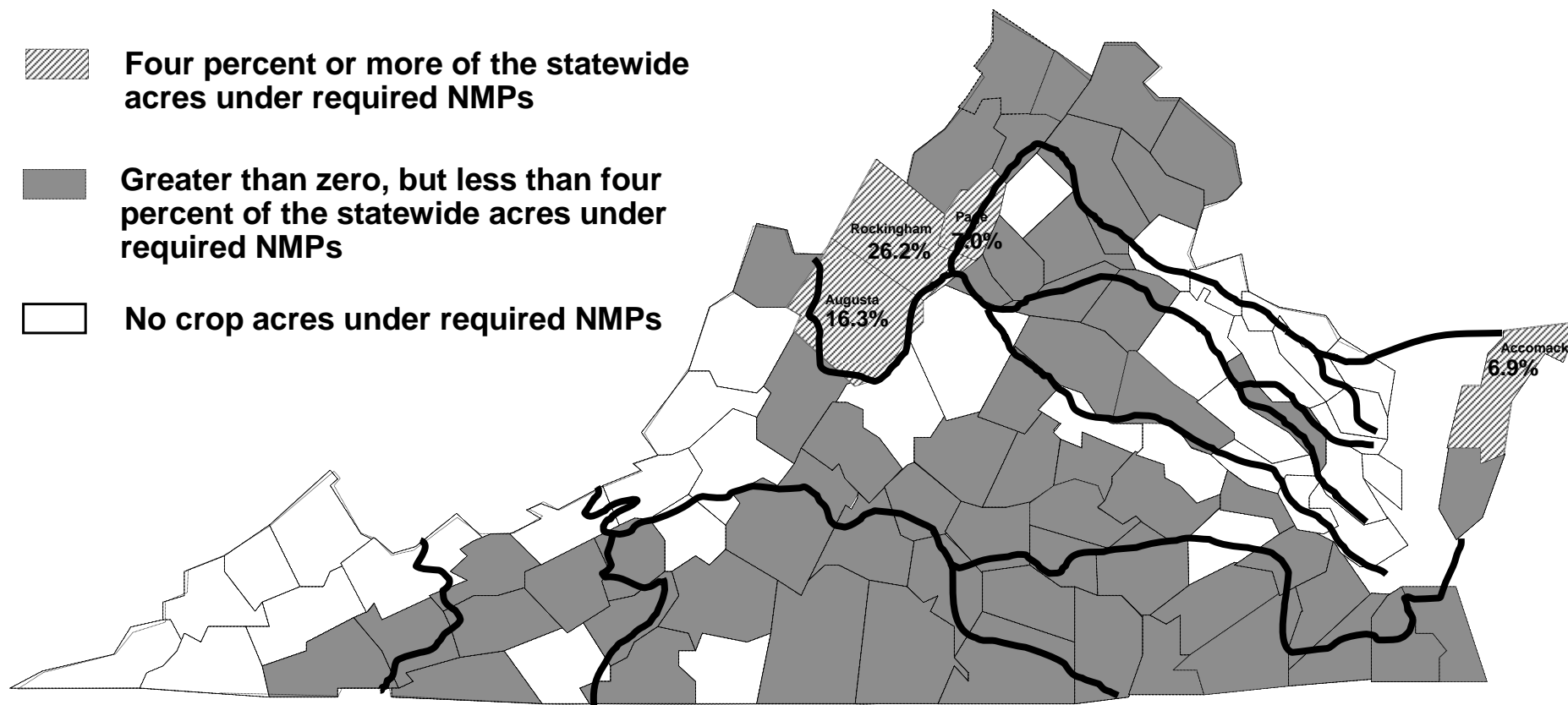
Confined Animal and Poultry Feeding Operations With Required NMPs

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Type of Operation	Number of Operations	Acreage Under Required Plans
Poultry	940	91,671
Dairy	74	48,981
Swine	59	10,102
Beef	7	4,749
Total	1,080	155,503

Note: These figures exclude facilities that were identified by JLARC staff as being closed or as having expired plans as of June 30, 2004.

Percentage of the Statewide Acres Managed Under Required NMPs, by County



Farmer Views on the Extent to Which Their Required NMPs Are Realistic

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How Realistic is the Plan?	Number	Percent
Always	53	19.2
Most of the Time	117	42.4
Sometimes	84	30.4
Rarely or Never	22	8.0
Total	276	100.0

Results From Farmers Indicate Their Plans Are Only Sometimes Or Rarely Realistic

Explanation for Why the <u>Required</u> NMP Is Only Sometimes, Rarely, or Never Realistic	Percentage of Respondents
The NMP's recommended amounts of nutrients, litter, or manure are too small	72
The NMP does not adequately consider farm economics	62
The NMP has unrealistic assumptions about management of excess manure or transport of excess litter from facility	36
The NMP provides impractical or inappropriate recommendations on the timing of fertilizer applications	28
The NMP recommendations are too complex and confusing	24
Note: Percentages based on the total number of valid responses (106). Respondents could choose more than one response, so the total percentage can be greater than 100 percent.	

Farmers Implement Required NMPs Most (But Not All) of the Time

Farmer/Planner Response	Percentage of Farmers	Percentage of Non-DCR Planners	Percentage of DCR Planners
<u>Always</u> implement plan	60	14	8
Implement plan <u>most</u> of the time	38	57	85
Implement plan <u>some</u> of the time	2	29	8
<u>Never</u> implement plan	0	0	0
Total Respondents	288	21	13

Farmers Who Believe NMPs Are Realistic Are More Likely to Implement Them

How Realistic is the Plan?	Number of Respondents Whose Plan is Realistic . . .	Farmers' Implementation of NMPs (Percentage of Respondents)		
		Always	Most of the Time	Some of the Time
Always	53	94	6	0
Most of the Time	117	57	43	0
Sometimes	84	40	56	4
Rarely or Never	22	50	36	14

Implementation of Voluntarily Adopted Plans Is Less than 100 Percent

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- **NMPs developed for voluntary purposes account for about 70 percent or about 366,000 acres of Virginia's planned acres**
- **Research findings indicate that implementation of voluntary NMPs may peak at 80 percent**
 - **A study of farmers on Maryland's Eastern Shore indicated that 80 percent of the fields received nutrient applications consistent with the recommendations in the NMPs**
 - **Chesapeake Bay Program staff stated that implementation rates for voluntary NMPs were likely to be between 60 and 80 percent**
 - **Only five percent of surveyed certified nutrient management planners indicated that they believed farmers always implement their voluntary NMPs**
- **In addition, there is very limited State oversight of plans adopted for voluntary reasons**

Inspection and Enforcement Activity for NMPs Has Been Weak

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- **Inspection and enforcement activity has been weak for several reasons, including:**
 - **Intent – a premium has been placed upon maintaining amicable relationships with the farmers who have required plans**
 - **Difficulty of the task – it is difficult to monitor what is really happening on the farms**
 - **Resource Impediments – staffing limitations and vacancies limit inspection capacity**

- **Opportunities exist to increase the rigor of the process**

- **The degree of rigor that is appropriate for the inspection and enforcement program is a policy choice. However, in instances of serious or repeated violations of NMP conditions, consideration should be given to authorizing inspectors to proceed more vigorously**

DEQ Inspection Approach

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- **DEQ is statutorily required to perform annual inspections of confined animal and poultry feeding operations**
- **Inspections are scheduled in advance**
- **Inspections include a record-keeping review and a visual inspection of waste facilities and selected fields**
- **Inspections can be described as informal and cooperative**

Inspections Often Lack First-Hand Observations of Nutrient Applications

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- For the most part, field inspections are not done during or immediately following field applications
 - DEQ seeks to distribute the workload of its inspectors throughout the year
 - DEQ staff express concerns that full inspections during field applications may be disruptive of farm operations
 - Consequently, DEQ inspectors are sometimes visually inspecting fields where nutrients were applied long before, including some fields where the crop is already grown
- DEQ could conduct visual inspections and take samples during times of nutrient applications, and review records and ask the farmer questions at a follow-up visit
- The current approach appears to rely excessively upon farmer records

Four DEQ Regions Did Not Meet Annual Inspection Requirement

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- **All annual inspections were not completed in recent years in four DEQ regions as required by State law:**
 - Northern Virginia—did not conduct inspections from 2001 to 2003
 - Tidewater—completed few inspections between July 2001 and April 2003
 - Piedmont—missed 41 percent of inspections for permitted facilities during FY 2004
 - Valley—missed 20 percent of inspections for permitted facilities during FY 2004

- **Regions report missing some inspections due to:**
 - Avian influenza outbreaks during March – September 2002 and September 2003 – March 2004
 - Limited staffing
 - Difficulty finding qualified candidates to fill vacant positions

Recommendation

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- **The Department of Environmental Quality should ensure that each region meets the *Code of Virginia's* annual inspection requirement**

Despite Limitations in the Rigor of Its Inspections, DEQ Finds Corrective Actions Are Needed in One-Third of Facilities

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- **JLARC staff reviewed DEQ inspection files for 227 randomly selected operations in five regions**
- **About 32 percent of the files documented at least one deficiency requiring corrective action**
- **In the previous inspection cycle, approximately 48 percent of the files had at least one deficiency noted that required corrective action**
- **DEQ inspectors may have identified additional deficiencies that they did not believe warranted corrective action**
- **Most frequently cited corrections include: lack of a current waste analysis, lack of a soil sample, over-application of nutrients, lack of records on fields, lack of a current litter analysis, and failure to comply with recommended spreading schedule**

DEQ Has Taken an Educational Approach to Enforcement

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- DEQ has taken an informal, educational approach to enforcement known as “compliance assistance”
- In most cases, DEQ uses informal procedures to gain compliance, such as identifying appropriate corrective actions or issuing warning letters for more serious environmental threats
- In the long term, DEQ may need to turn to more formal enforcement actions, particularly in instances of serious and/or repeated violations

Some Cases May Warrant Greater Enforcement

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- During the file review JLARC staff identified nine instances in which the number of animals in confinement at the time of inspection was greater than listed in the NMP
 - One facility had 24,000 turkeys, instead of the 11,000 accounted for by the NMP (The inspection report did not address the issue that the facility had more than twice as many birds as permitted by the NMP)
- Language in the special conditions of NMPs states that the plan is void if the number of animal units in the NMP is exceeded
- Animal numbers in excess of the amount indicated in the NMP up to ten percent are informally allowed by DEQ
- DEQ may need to develop guidelines for inspectors that outline thresholds for action, and the actions that should be taken, when the animal number is exceeded

Nutrient Over-Applications May Warrant Greater Enforcement

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- In one instance, the total nitrogen applied to a seven-acre field was exorbitant, exceeding the allowable rate by approximately 200 pounds per acre
- In a second example, nitrogen applied to a 12-acre farm exceeded the allowable rate by 46-47 pounds per acre in two consecutive years
- Over-applications of these magnitudes should cause concern, especially if occurring more than once or on more than one field
- DEQ's response has been to seek adjustments to future NMP application rates
- Environmental consequences resulting from these types of over-application cannot be corrected by adjusting future NMP application rates

Operations with Repeated Deficiencies May Warrant Greater Enforcement

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- JLARC staff identified 16 facilities that had identical items requiring corrective action in two consecutive inspections
- Eight facilities were missing current litter, waste, or soil analyses in consecutive years
- Two operations had expired soil samples in inspections that were eight or nine months apart
- A number of facilities also had more than one deficiency identified during an annual inspection

Recommendation

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- **The Department of Environmental Quality should take stronger enforcement action against facilities with serious or repeated violations**

Agency Guidelines for Enforcement Actions Could Lead to More Consistency

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- Guidelines that outline common deficiencies and appropriate corrective actions and timelines could be useful

- A system could be developed to:
 - Assign point values for various violations; and
 - Suggest point thresholds for informal and formal enforcement action

- Greater centralized training opportunities could also improve consistency

Recommendation

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- **The Department of Environmental Quality should develop guidelines for enforcement activity that promote greater consistency across regions**

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Poultry Waste Transfer Issues

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- **More than 577,000 tons of poultry litter was produced in Virginia in 2003**
- **Of that amount, approximately 411,000 tons (71 percent) was transferred from the operation on which it was produced to another facility**
- **A JLARC staff analysis of a subset of litter transfers indicates that for the most part litter is transferred within the DEQ region in which it is produced**
 - **This means that high poultry production areas are keeping the litter that they produce**
 - **Continuous application of poultry litter to the same soils may result in soil saturation of phosphorus because of the inability of plants to use that nutrient as much as nitrogen**
- **Although the ability of the nutrients to effect water quality if animal waste is improperly handled exists, receiving farms are not required to implement NMPs**

***Code of Virginia* Requires Tracking and Accounting of Poultry Waste Transfers**

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- **The *Code of Virginia* requires that poultry litter transfers be tracked and accounted for**
- **Poultry litter may be applied to a farming operation's own fields, transferred to another farming operation's fields, or transferred to a broker**
 - **A poultry waste broker is an individual other than the poultry grower, who possesses more than ten tons of poultry waste in any 365-day period and who transfers some or all of the waste to other persons**
- **The appropriate transfer and disposal of poultry litter is an important concern for the Commonwealth, due to the potential that this waste has to degrade water quality if improperly managed**




Regulatory Requirements for Poultry Waste Transfers

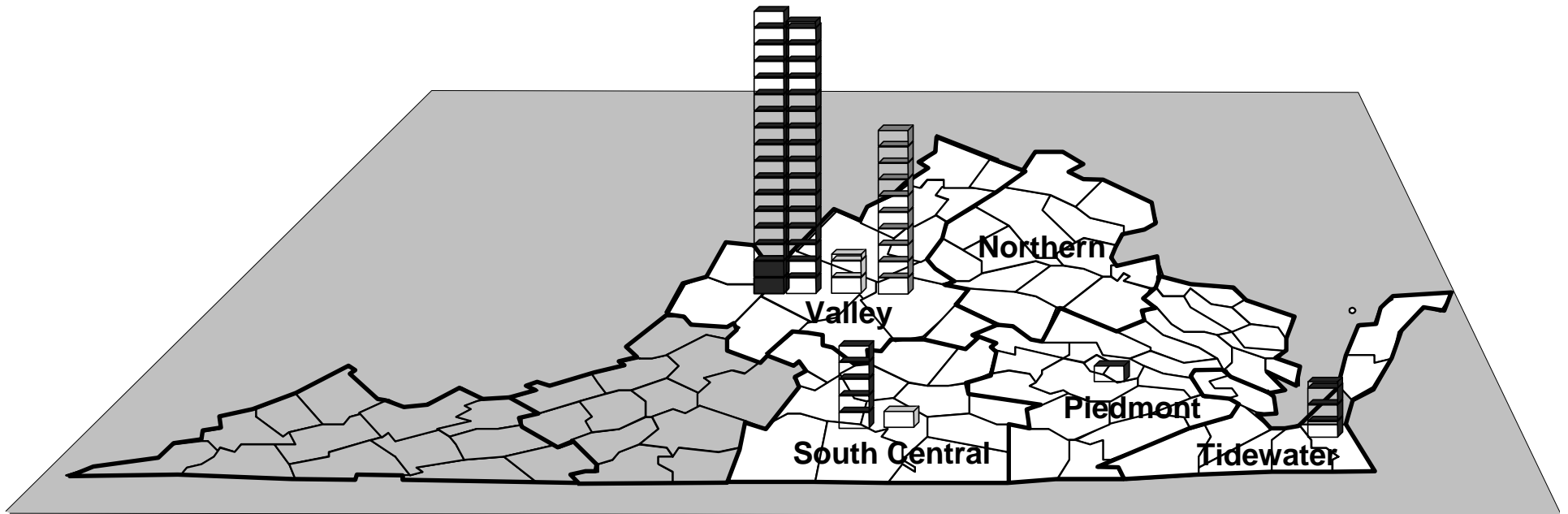
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- Poultry growers and brokers must record the amount transferred, date of transfer, nutrient content of the waste, the locality in which the recipient intends to utilize the waste, and the nearest waterbody known to the recipient
- Poultry growers and brokers must provide waste recipients with nutrient analysis of waste
- Poultry growers and brokers must maintain their records for review by DEQ during annual inspections
- Recipients of waste must provide their name and address to the person transferring the waste, however that information does not have to be provided to DEQ

Regional Poultry Litter Transfer Activities from a Subset of DEQ Inspection Reports, FY 2001-2004

Total litter transferred, FY 2001 – FY 2004, was approximately 59,000 tons

-  = 1,000 tons transferred within region
-  = 1,000 tons transferred to another region of Virginia
-  = 1,000 tons transferred to broker



Farmer Views on Record-Keeping Requirements for Poultry Waste Transfers

53

- JLARC surveyed farmers with NMPs and farmers without NMPs on their opinions concerning three record-keeping related issues
 - 71 percent of respondents indicated the clarity of requirements was very clear or clear,
 - 52 percent of respondents indicated it was very easy or easy to compile required records,
 - 50 percent of respondent indicated record-keeping requirements and water quality are related or closely related

DEQ Is Not Adequately Accounting for Litter Transfers

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- **DEQ staff are responsible for collecting poultry waste transfer sheets during annual inspections**
- **Transfer sheets sent to DEQ's central office are not analyzed**
- **A central CAFO coordinator position that was recently filled, will be responsible for tracking and analyzing litter transfers in the future**
- **According to DEQ staff, the department cannot determine if all poultry litter brokers are submitting their annual reports as required, because in some cases, the information the department receives does not adequately identify the broker**

Exact Amount of Litter Transferred Outside the Valley Could Not Be Determined

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- Due to the frequency of transferring litter to brokers and incomplete or illegible transfer sheets, a destination could not be determined for 27 percent of the litter that had been recorded as transferred between FY 2001 and 2004
- Some litter transfers could not be accounted for because the transfer sheet only indicated that the litter went to a “broker,” but did not provide the name of the broker
- The large amount of litter transferred to brokers in the Valley region is a concern since DEQ can not ensure that brokers are submitting their annual reports

Litter Tracking Could Be Improved

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- **Several problems exist with the State's current poultry litter tracking policy**
 - **DEQ staff indicated regulated farmers may become the "purchasers" of the litter from their own birds and are no longer required to manage it in accordance with a NMP**
 - **Current regulations do not require the poultry farmer transferring the litter to provide to DEQ the name and address of the recipient of the litter**
 - **The regulations currently do not require litter brokers to analyze the nutrient content of the litter prior to reselling it**

Recommendations

In accordance with section 62.1-44.17:1.1 of the *Code of Virginia*, the Department of Environmental Quality should develop and implement a statewide accounting system for poultry waste that compiles and analyzes the amount of poultry waste transferred in Virginia and the geographic distribution of the transferred waste

The Department of Environmental Quality should monitor the transfer of poultry litter to poultry litter brokers to ensure that they are annually submitting copies of their poultry transfer records required by subsections A and C of section nine of the Virginia Administrative Code 25-630-60

Recommendations

The Department of Environmental Quality, in conjunction with the Department of Conservation and Recreation, should develop a procedure for identifying potential misuse of litter that is transferred and should develop a policy to prevent it. Requiring the name and address of the poultry litter recipient should be considered

The Department of Environmental Quality should amend section nine of the Virginia Administrative Code 25-630-60 to include a section stating that if a poultry waste broker stores litter from two or more farming operations together, the broker should provide an updated nutrient analysis reflecting the content of the aggregated litter

Status of Virginia's Pilot Poultry Litter Transport Program

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- Section 62.1-44.17:1.1(6) of the *Code of Virginia* required each commercial poultry processor operating in Virginia to develop a plan explaining how they would achieve certain programmatic objectives, including the development of a poultry waste transportation program
- DCR and the State's poultry processors entered into a joint agreement to provide a total of \$50,000 in funding for a poultry litter cost-share pilot transport program beginning in March 2003
 - Receiving farms were required to store and apply the litter to their fields in accordance with a DCR-approved NMP
- The program's stated goal was to move poultry litter outside the State's main poultry producing counties such as Augusta, Page, Rockingham, and Shenandoah to receiving farms that had been identified as having soils with low phosphorus content

Pilot Program Moved Slightly More Than One-Third of Intended Amount in First Year

60

■ The first year of the program was not successful

- Only 16 farmers applied for cost-share reimbursements totaling \$5,125 in payments to apply 1,342 tons of litter
- This was only about eight percent of the 16,000 tons the program would support

■ Lack of interest was attributed to:

- Farming community was not familiar with the program
- The 2003 growing season was too wet for many farmers to apply fertilizer to their fields
- Funding level of \$6 per acre was considered too low

Increased Interest Was Experienced in the Second Year of the Program

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- **With almost \$45,000 in funds remaining, the pilot was carried over into 2004**
 - **DCR revised the program and increased cost-share assistance to \$10 per acre**

- **In 2004, 43 applications were approved for cost-share assistance**
 - **The approved applicants have applied 4,396 tons of litter and received \$15,880 in funds**
 - **By the end of 2004, DCR expects the original \$50,000 will be exhausted if all of the approved applicants end up applying litter**

The Future of the Program Is Uncertain

62

- **DCR staff reported that the program will probably not be carried into 2005 unless the commercial poultry processors are interested in providing additional funds for the program**
 - **The Virginia Poultry Federation told JLARC staff that the poultry processors had fulfilled their obligations under section 62.1-44.17.1:1 of the *Code of Virginia***
 - **There is no language mandating that a litter transfer Cost-share program be funded in perpetuity**
 - **Other states, such as Maryland, have developed agreements with poultry processors to fund part of their transport program**

Maryland and Delaware Litter Transport Programs Have Been More Successful

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- **Maryland and Delaware’s litter transport programs have resulted in the movement of substantial amounts of litter**
 - **In Delaware, more than 177,000 tons of poultry litter have been either applied to land within or outside the Delmarva Peninsula or transported for alternative use projects since the program’s inception**
 - **Maryland’s program transported 31,000 tons of poultry litter in FY 2004; with “critical” counties on the lower Maryland Eastern Shore accounting for more than 85 percent of this total**

- **A couple of reasons may account for the greater success of the Maryland and Delaware programs**
 - **Maryland and Delaware have more mature programs that began as early as 1999, and over time have grown as a result of modifications**
 - **The majority of poultry litter is being transported for alternative use projects**

Maryland and Delaware Programs Have Received Strong Financial Support

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- In Maryland, poultry processors are not required to contribute matching funds, but they have always done so
 - For example, in FY 2003, more than \$463,000 of financial support was provided to participants with 50 percent coming from the poultry processors and 50 percent in state funds
- Delaware contributed \$246,000 in 2004 to their litter transport program

Alternative Methods to Reduce Nutrients in Poultry Litter and Animal Waste

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- **The Poultry Waste Management Act requires commercial poultry processors to participate in the development of alternative uses of poultry litter**
 - **Phytase is an enzyme that, when added to poultry feed, can reduce phosphorus content of litter up to 30 percent**
 - **Virginia has achieved reductions of approximately 20 percent through the use of phytase**
 - **Other potential methods include pelletization and energy generation**

- **Solid separation and phytase can be used to reduce nutrients from dairy and swine waste**

Recommendation

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- **The State may wish to consider regulatory requirements for and/or the use of financial incentives to processors to ensure that phytase is incorporated in all poultry feed used in Virginia**

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- Use of Nutrient Management Planning Outside of Farmland and on State Lands
- State Policy Options

Four Percent of Urban Acres are Covered by Nutrient Management

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- Besides agriculture, fertilizer use in urban and rural settings also contributes nutrients to State waters
- Approximately 40,300 out of 1.1 million acres of pervious urban and mixed open lands are covered by nutrient management plans or agreements

Current and Potential Efforts to Increase Nutrient Management Awareness in Non-agricultural Areas

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■ DCR's efforts:

- Water Quality Improvement Agreements with professional lawn care groups offer guidelines for proper fertilizer application rates and timing
- NMPs are in place on approximately 80 golf courses in Virginia
- Several educational documents to target homeowners

■ Opportunities to increase acreage in non-agricultural settings

- Large scale media campaigns and intensive one-one-on training sessions have shown promise in making homeowners more aware of nutrient-related issues
- DCR could work with lawn supply retailers to promote point-of-sale distribution of materials about proper lawn fertilization
- Proper fertilizer labels could be beneficial, as many consumers consult this source for information

Use and Implementation of NMPs by State Agencies

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- **47 State agencies and institutions are responsible for managing more than 658,000 acres of land**
- **The only State land currently required to have a NMP are State agricultural operations with a permit for confined animals**
 - **The Southampton Correctional Facility farm, a regulated confined hog operation, and the farm operation at Virginia Tech, are the only State operations that fall into this category**

NMPs Usage on State-owned and Leased Agricultural and Non-agricultural Lands

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- **Of the 27,000 acres of agricultural land, 93 percent (25,000 acres) is managed by a NMP**
 - **The Department of Corrections (DOC) agribusiness operation uses NMPs at 28 facilities covering more than 12,000 acres of pasture-, crop-, and woodland**
 - **Virginia Tech's College of Agriculture and Life Sciences uses a NMP to manage approximately 56 percent of the 3,200 acre farm that produces livestock and crops**

- **At least thirty State agencies and institutions are responsible for managing 632,000 acres of non-agricultural lands. However, only about half of this land receives nutrient applications**

Opportunities to Increase Use of NMPs on State-Owned or Leased Lands

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- Opportunities exist for increasing nutrient management planning on roadside land maintained by the Department of Transportation and some smaller State land holdings
 - VDOT is negotiating with DCR to develop a nutrient management planning certification course for their staff
- The Commonwealth should move to place all State-owned or leased acreage that receives nutrient applications under NMPs
- An executive order could be used to take this action (for example, Governor Wilder issued an executive order in 1993 that required State-owned or leased agricultural land to develop a conservation plan, including a NMP)

Recommendation

The Governor should issue an executive order directing State agencies and institutions to develop nutrient management plans for State-owned lands on which nutrients are applied. The Department of Conservation and Recreation should provide assistance upon request of the State's agencies and institutions concerning the proper development and implementation of nutrient management plans

Presentation Outline

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- Introduction
- Background
- Nutrient Management Plans for Agricultural Land
- Virginia's Poultry Waste Transfer and Alternative Uses Program
- Use of Nutrient Management Planning Outside of Farmland and on State Lands
- State Policy Options

Three Options Regarding the Future of Virginia's Nutrient Management Program

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- Report describes three options regarding the role of NMPs in pursuing water quality goals:
 - Continue with the current approach to the program while transitioning to “phosphorus-based” nutrient management planning
 - Increase the extent to which the use of nutrient management plans are required and the items in those plans are enforced
 - Encourage growth in the extent to which acreage is covered in Virginia by voluntarily-adopted and implemented plans through financial incentives and greater plan flexibility
- Elements of these options are not mutually exclusive; for example, phosphorus-based plans can be implemented while both increasing the extent to which plans are undertaken on a mandatory and a voluntary basis

Option One: Implement Phosphorus-based NMPs, But Maintain Status Quo

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- Research indicates that excess phosphorus can cause eutrophication and “dead-zones”
- Proposed changes to DCR’s training and certification regulations include requiring that all plans be developed using phosphorus as the primary limiting factor
 - Since October 1, 2001, plans developed for confined poultry feeding operations have been required to be phosphorus-based
 - Approximately 300 confined animal feeding operations would be affected in addition to plans developed voluntarily
- Phosphorus-based planning will also be required by the federal government beginning in 2006 for all large confined animal and poultry feeding operations

Option One: Implement Phosphorus-Based NMPs, But Maintain Status Quo (cont.)

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- Under DCR's proposed approach, fields would be screened for potential phosphorus loss in two parts:
 - Phosphorus saturation levels in soils would be measured
 - For those fields that have high levels of soil phosphorus, a phosphorus index would be calculated to determine potential loss
- Fields that are identified as having a high potential for phosphorus loss would be precluded from applying additional amounts of phosphorus while fields with less loss potential would be able to apply nutrients at rates relative to that potential
- Calculation of a phosphorus index has been described as more labor intensive, at least initially, and could substantially increase the time needed to develop some NMPs

Option Two: Increase the Extent to Which NMPs Are Enforced by the State

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- Virginia's reliance on voluntary development and implementation of NMPs on agricultural acreage has been slow to add additional acres
- Issues of equity between land used for agricultural activities and non-agricultural activity also exist
- Virginia could choose to increase the amount of acreage that is required to be managed under a plan by:
 - Lowering the animal unit threshold at which plans are required from 300 animal and 200 poultry units to some lower number,
 - Requiring the implementation and maintenance of NMPs written for the Chesapeake Bay Preservation Act, or
 - Requiring NMPs on farms producing above a certain level of income, as in Maryland

Option Two: Increase the Extent to Which NMPs Are Enforced by the State (continued)

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- **Issues of equity also arise when compliance reviews are not carried out consistently across the State**

- **Making changes to current DEQ inspection process**
 - **Scheduling more inspections to coincide with actual nutrient applications**

 - **Taking greater enforcement action when serious or repeat violations are identified**

Option Three: Encourage More Voluntary NMPs, in Part by Setting Realistic Acreage Goals

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- **Since 1993, Virginia has been involved with planning the means for achieving nutrient and sediment reduction goals on State tributary waters that flow to the Chesapeake Bay**
- **Nutrient management planning for agricultural land in the Bay watershed has been a major part of that process, in part because of the low cost associated with plan development**
- **However, several issues indicate that the State may be overly optimistic regarding the amount of acreage under a NMP for which it can take credit:**
 - **Number of nutrient management plans for agricultural land currently credited by the Bay Program may be too high**
 - **Failure to account for increases in fertilizer usage**
 - **NMP implementation levels for agricultural and non-agricultural lands under State strategies for 2010 may be unrealistic**

Option Three: Encourage More Voluntary NMPs, in Part by Setting Realistic Acreage Goals (cont.)

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- **Increasing State financial assistance for nutrient management may lead to a greater level of implementation by assisting farmers with the potential costs associated with NMP use**
 - **Increasing funding and/or resources for plan development and a poultry litter transport program**
 - **Introducing financial incentives or insurance that protect farmers against the risk of low crop yields that might unexpectedly result from reduced nutrient applications**

- **Encouraging greater participation by making the nutrient management process more user-friendly to the farmer**
 - **Allowing plan writers to make modifications to a plan without prior DCR approval (while requiring departmental review of the changes after the fact) may encourage some farm operators to implement plans that they otherwise would not**
 - **Reducing the complexity of the plan itself may also encourage farm implementation**

Conclusion

- **NMPs have the potential to reduce nutrient losses in agricultural and non-agricultural settings**
- **There are 522,000 agricultural acres currently covered by NMPs in Virginia, but substantial acreage is not currently covered**
- **Voluntary and required plans for agriculture are not implemented 100 percent of the time. However, implementation appears to be occurring most of the time**
- **Enforcement of required NMPs has been weak. To date, little action has been taken with regard to repeat or serious violations**
- **Options exist for State policy-makers regarding the future direction of Virginia's nutrient management program**