

# Chapter 8

## Agriculture and Water Quality

### 8.1 Animal Operations

In 1992, the Environmental Management Commission (EMC) adopted a rule modification (15A NCAC 2H.0217) establishing procedures for managing and reusing animal wastes from intensive livestock operations. The rule applies to new, expanding or existing feedlots with animal waste management systems designed to serve animal populations of at least the following size: 100 head of cattle, 75 horses, 250 swine, 1,000 sheep or 30,000 birds (chickens and turkeys) with a liquid waste system. Key legislative actions are described below.

#### **Key Animal Operation Legislation (1995-2003)**

- 1995 Senate Bill 974 requires owners of swine facilities with 250 or more animals to hire a certified operator. Operators are required to attend a six-hour training course and pass an examination for certification. Senate Bill 1080 established buffer requirements for swine houses, lagoons and land application areas for farms sited after October 1, 1995.
- 1996 Senate Bill 1217 required all facilities (above threshold populations) to obtain coverage under a general permit, beginning in January 1997, for all new and expanding facilities. DWQ was directed to conduct annual inspections of all animal waste management facilities. Poultry facilities with 30,000+ birds and a liquid waste management system were required to hire a certified operator by January 1997 and facilities with dry litter animal waste management systems were required to develop an animal waste management plan by January 1998. The plan must address three specific items: (1) periodic testing of soils where waste is applied; (2) development of waste utilization plans; and (3) completion and maintenance of records on-site for three years. Additionally, anyone wishing to construct a new or expand an existing swine farm must notify all adjoining property owners.
- 1997 House Bill 515 placed a moratorium on new or existing swine farm operations and allows counties to adopt zoning ordinances for swine farms with a design capacity of 600,000 pounds (SSLW) or more. In addition, owners of potential new and expanding operations are required to notify the county (manager or chair of commission) and local health department, as well as adjoining landowners. DENR was required to develop and adopt economically feasible odor control standards by March 1, 1999.
- 1998 House Bill 1480 extended the moratorium on construction or expansion of swine farms. The bill also requires owners of swine operations to register with DWQ any contractual relationship with an integrator.
- 1999 House Bill 1160 extended (again) the moratorium on new construction or expansion of swine farms, required DENR to develop an inventory of inactive lagoons. The Bill requires owners/operators of an animal waste treatment system to notify the public in the event of a discharge to surface waters of the state of 1,000 gallons or more of untreated wastewater.
- 2000 Attorney General Easley reached a landmark agreement with Smithfield Foods, Inc. to phase out hog lagoons and implement new technologies that will substantially reduce pollutants from hog farms. The agreement commits Smithfield to phase out all anaerobic lagoon systems on 276 company-owned farms. Legislation will be required to phase out the remaining systems statewide within a 5-year period (State of Environment Report 2000).
- 2001 House Bill 1216 extended (again) the moratorium on new construction or expansion of swine farms.

Table 14 summarizes (by subbasin) the number of registered livestock operations, total number of animals, number of facilities, and total steady state live weight (SSLW). These numbers reflect only operations required by law to be registered, and therefore, do not represent the total number of animals in each subbasin.

The majority of registered animal operations are found in subbasin 05-07-03. No violations or problems have been reported for any of the registered animal operations in the New River basin.

Table 14 Registered Animal Operations in the New River Basin (September 2004)

Subbasin	Cattle			Poultry			Swine		
	No. of Facilities	No. of Animals	Total Steady State Live Weight*	No. of Facilities	No. of Animals	Total Steady State Live Weight*	No. of Facilities	No. of Animals	Total Steady State Live Weight*
04-03-01	0	0	0	0	0	0	1	300	40,500
04-03-02	0	0	0	0	0	0	0	0	0
04-03-03	9	2,361	3,305,400	0	0	0	0	0	0
<b>Totals</b>	<b>9</b>	<b>2,361</b>	<b>3,305,400</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>40,500</b>

\* Steady State Live Weight (SSLW) is in pounds, after a conversion factor has been applied to the number of swine, cattle or poultry on a farm. Conversion factors come from the US Department of Agriculture, Natural Resource Conservation Service (NRCS) guidelines. Since the amount of waste produced varies by hog size, this is the best way to compare the sizes of the farms.

## 8.2 Impacted Streams in Agricultural Areas

In the New River basin, the majority of agricultural land is pasture. There are also a variety of specialty crop farms in this river basin including apple orchards and Christmas tree farms. Impacts to streams from agricultural activities can include excessive nutrient loading, pesticide and herbicide contamination, bacterial contamination and sedimentation.

Based on the most recent information from the USDA Natural Resources Conservation Service (NRCS) National Resources Inventory (NRI), agricultural land use in the New River basin has decreased. Cultivated and uncultivated cropland decreased by 58.9 percent (8,600 acres) and 58.5 percent (13,100 acres), respectively. Pasture use decreased by 4.2 percent (5,300 acres). This same data also shows that urban and built-up areas increased by almost 46.0 percent (9,800 acres) (USDA-NRCS, June 2001). Refer to Appendix III for more information related to land use changes in the New River basin.

### 2005 Recommendations

DWQ will identify streams where agricultural land use may be impacting water quality and aquatic habitat. Local Soil and Water Conservation District (SWCD) and NRCS staff should investigate these streams to assess agricultural impacts and recommend best management practices (BMPs) to reduce the impacts. DWQ recommends that funding and technical support for agricultural BMPs continue and increase. Refer to Appendix VIII for agricultural nonpoint source agency contact information.

## **8.3 Agricultural Best Management Practices and Funding Opportunities**

### **8.3.1 USDA – NRCS Environmental Quality Improvement Program (EQIP)**

The USDA – Environmental Quality Improvement Program (EQIP) provides technical, educational and financial assistance to eligible farmers to address soil, water and related natural resource concerns on their lands in an environmentally beneficial and cost-effective manner. The program provides assistance to farmers in complying with federal and state environmental laws and encourages environmental enhancement. The purposes of the program are achieved through the implementation of a conservation plan that includes structural, vegetative and land management practices on eligible land. Two to ten-year contracts are made with eligible producers. Cost share payments may be made to implement one or more eligible structural or vegetative practices, such as animal waste management facilities, composters, filter strips, livestock exclusion and permanent wildlife habitat. Incentive payments can be made to implement one or more land management practices, such as nutrient management, pest management, grazing land management and long-term conservation tillage.

Sixty percent of the funding available for this program is targeted at natural resource concerns relating to livestock production. The program is carried out at the county level with base funding levels made available to each county. In North Carolina, EQIP was funded at approximately \$14.0 million for 2005.

In the New River Basin, 7,550 feet of access roads were stabilized or repaired; 18,000 feet of fence was installed; two agrichemical handling facilities were constructed; and eight feed and waste structures were built through EQIP funds from 1998 to 2003. During the next few years, an additional 14,000 feet of access roads will be stabilized or repaired; an additional 27,000 feet of fence will be installed; four additional agrichemical handling facilities will be constructed; and six additional feed and waste structures will be built. NRCS district contacts for the New River basin are provided in Appendix VIII. Information can also be found on the NRCS website <http://www.nc.nrcs.usda.gov/programs/EQIP/index.html>.

### **8.3.2 NC Agriculture Cost Share Program**

The NC Agricultural Cost Share Program (NCACSP) was established in 1984 to help reduce agricultural nonpoint runoff into the state's waters. The program helps owners and renters of established agricultural operations improve their on-farm management by using best management practices (BMPs). These BMPs include vegetative, structural or management systems that can improve the efficiency of farming operations while reducing the potential for surface and groundwater pollution. The NCACSP is implemented by the Division of Soil and Water (DSWC), which divides the approved BMPs into five main purposes or categories.

- *Erosion Reduction/Nutrient Loss Reduction in Fields*  
Erosion/nutrient management measures include planned systems for reducing soil erosion and nutrient runoff from cropland into streams. Practices include: critical area planting, cropland conversion, water diversion, long-term no-till, pastureland conversion, sod-based rotation, stripcropping, terraces, and Christmas tree conservation cover.

- *Sediment/Nutrient Delivery Reduction from Fields*  
 Sediment/nutrient management measures include planned systems that prevent sediment and nutrient runoff from fields into streams. Practices include: field borders, filter strips, grassed waterways, nutrient management strategies, riparian buffers, water control structures, streambank stabilization, and road repair/stabilization.
- *Stream Protection from Animals*  
 Stream protection management measures are planned systems for protecting streams and streambanks. Such measures eliminate livestock access to streams by providing an alternate watering source away from the stream itself. Other benefits include reduced soil erosion, sedimentation, pathogen contamination and pollution from dissolved, particulate, and sediment-attached substances. Practices include: heavy use area protection, livestock exclusion (i.e., fencing), spring development, stream crossings, trough or watering tanks, wells, and livestock feeding areas.
- *Proper Animal Waste Management*  
 A waste management system is a planned system in which all necessary components are installed for managed liquid and solid waste to prevent or minimize degradation of soil and water resources. Practices include: animal waste lagoon closures, constructed wetlands, controlled livestock lounging area, dry manure stacks, heavy use area protection, insect and odor control, stormwater management, waste storage ponds/lagoons, compost, and waste application system.
- *Agricultural Chemical (agrichemical) Pollution Prevention*  
 Agrichemical pollution prevention measures involve a planned system to prevent chemical runoff to streams for water quality improvement. Practices include: agrichemical handling facilities and fertigation/chemigation back flow prevention systems.

The NCACSP is a voluntary program that reimburses farmers up to 75% of the cost of installing an approved BMP. The cost share funds are paid to the farmer once the planned BMP is completed, inspected and certified to be installed according to NCACSP standards. The annual statewide budget for BMP cost sharing is approximately \$6.9 million. From 1998 to 2003, \$910,336 was provided for projects in the New River basin. Table 15 summarizes the cost and total BMPs implemented (i.e., acres, units, linear feet) throughout the New River basin. Specific project information can be found in the subbasin chapters (Chapters 1 – 3).

County Soil and Water Conservation District (SWCD) contacts for the New River basin are included in Appendix VIII. BMP definitions and DSWC contact information can be found online at [www.enr.state.nc.us/DSWC/pages/agcostshareprogram.html](http://www.enr.state.nc.us/DSWC/pages/agcostshareprogram.html).

Table 15 Summary of NCACSP projects in the New River Basin (1998 to 2003)

Purpose of BMP	Subbasin 05-07-01		Subbasin 05-07-02		Subbasin 05-07-03	
	Total Implemented	Cost	Total Implemented	Cost	Total Implemented	Cost
Erosion Reduction/Nutrient Loss Reduction in Fields	4,567 acres	\$20,607	370 acres	\$22,607	9 acres 1,000 linear ft.	\$1,366 \$1,717
Sediment/Nutrient Delivery Reduction from Fields	2 acres	\$169	1 acre	\$1,513		
Stream Protection from Animals	453 units 29,384 linear ft.	\$202,293 \$36,545	1,395 units 17,496 linear ft.	\$257,317 \$19,983	502 units 24,550 linear ft.	\$204,574 \$29,909
Proper Animal Waste Management	1 unit	\$18,102	2 units	\$29,614	4 units	\$35,031
Agricultural Chemical Pollution Prevention	1 unit	\$6,361	2 units	\$22,628		
Total Costs		\$284,077		\$353,662		\$272,597
<b>Benefits*</b>	<b>Subbasin 05-07-01</b>		<b>Subbasin 05-07-02</b>		<b>Subbasin 05-07-03</b>	
Total Soil Saved (tons)	8,819		1,538		2,300	
Total Nitrogen (N) Saved (lb.)	6,534		6,189		1,510	
Total Phosphorus (P) Saved (lb.)	4,240		5,121		67	
Total Waste-N Saved (lb.)	3,310		1,277		5,410	
Total Waste-P Saved (lb.)	2,014		1,087		2,962	

\* The North Carolina Agricultural Nutrient Assessment Tool (NCANAT) contains two field-scale assessment tools: the Nitrogen Loss Estimation Worksheet (NLEW) and the Phosphorus Loss Assessment Tool (PLAT). NCANAT is a product of the cooperative effort between the NC State University, NC Department of Agriculture & Consumer Services, USDA-NRCS and the DENR. The tool consists of a function that allows comparisons to be made before and after BMPs are installed. Gains and losses of nitrogen, phosphorus and sediment due to BMP implementation can be computed. The DSWC has adopted this program to calculate these losses for the NCACSP reporting requirements.