APPENDIX H

Agricultural Environmental Management Strategy

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PECONIC ESTUARY PROGRAM AGRICULTURAL ENVIRONMENTAL MANAGEMENT STRATEGY

Foreword

The Agricultural Nitrogen Management Committee extends its deep appreciation to the East End farming community, which has been instrumental in investigating and developing a nutrient and pesticide reduction strategy.

Summary of Goals

To cooperatively develop, with the region's agricultural community, a strategy to lower nutrients and pesticide inputs into the environment. A 20 percent to 30 percent reduction of agricultural fertilizer nitrogen inputs is targeted over a five-year period, and may be measured by voluntary reporting, surveys, fertilizer sales data, and groundwater monitoring.

To maintain, and hopefully increase, farm profitability while demonstrating that changes in farming practices can have measurable environmental improvements.

To emphasize incentive-based pollution reduction strategies (*e.g.*, tax credits). This will be linked to market development and product distribution associated with other agricultural economic planning efforts underway in the region.

To attain 90 percent participation within the farming community in a Long Island Agricultural Environmental Management (AEM) program within five years.

Summary of Recommendations

This Committee strongly recommends that the following tasks be pursued to begin reducing nutrient and pesticide impacts on the Peconic Estuary. The rationale and supporting details of each task is outlined in further detail in the body of this report.

Task I Develop a Long Island component to the New York State Agricultural Environmental Management (AEM) program. The Long Island component would be tailored to the Peconic Estuary Region (as well as other Long Island regions, as appropriate).

Task II Identify potential pilot projects to demonstrate Best Management Practices and test them, where appropriate.

Task III Investigate the creation of a farm insurance plan.

Task IV Provide funding for increased local AEM development and implementation.

Task V Investigate and implement innovative/alternative finance mechanisms for education and outreach and other tasks noted above.

Task VI Gather and analyze economic data on a regular basis and continue to promote and integrate economic analyses and support mechanisms into the AEM initiatives.

Agricultural Nitrogen Management Committee — Background

Because of the need to develop a regional, quantitative nitrogen loading management process, the Peconic Estuary Program (PEP) formed work groups (committees) to deal with agricultural issues, non-agricultural issues and a west estuary total maximum daily load (TMDL). The goal of each committee is to set quantitative loading targets and detailed plans for load management (timing, costs, responsible entities, etc.).

The Agricultural Nitrogen Management Committee was charged with refining existing agricultural nitrogen loading estimates and developing an implementation plan for regional nitrogen load reductions. This effort includes expanding the Agricultural Environmental Management (AEM) initiative and considering the "Purchase of Development Rights" links to farm management plans. The Committee has also expanded its issues to include pesticides.

To date, the Agricultural Nitrogen Management Committee has made significant progress towards its goals, including producing agricultural use geographic information systems (GIS) maps (for the Towns of Southold, Southampton and Riverhead), and determining the nitrogen loading rates and estimates of potential reductions for specific crops (see **Attachment H-2**). These are major tasks that will be described and integrated in future reports.

While these initiatives were developed with a focus on the Peconic Estuary Program's needs, the Committee notes that there will be a countywide benefit for groundwater and surface water. For example, AEM programs will be countywide, and not just targeted at the Peconic Estuary watershed. Thus, benefits will also accrue to the surface waters of the Long Island Sound and South Shore Estuary Reserve.

Introduction

Maintaining a viable farming industry that serves its community (broadly Long Island) is important for the region economically. Suffolk County is the top producer of agricultural products in terms of sales in New York State, representing up to six percent of Suffolk County's gross domestic product. Recent estimates indicate that an estimated 10,000 people are employed by agriculture-related businesses.

Agriculture is a significant underpinning of eastern Suffolk County's tourism-based economy. Residents and visitors enjoy the rural quality of the area and shopping at numerous local farm stands. A survey of 968 residents, second homeowners and tourists in 1995 revealed that the public's overall priority for land protection was protecting farmland. The survey responses imply that the public would be willing to spend $74.5 thousand per acre of farmland protection, using a 25-year time horizon and a seven percent discount rate in 1995 dollars (EAI, 1999).

The State of Agriculture

At the end of World War II, more than 110,000 acres of arable land were cultivated in Suffolk County. In response to the rapid suburbanization of the 1950s and 1960s, the County adopted the nation's first Farmland Protection Program in the mid-1970s. Through the Farmland Protection Program, the county pays farmers for their development interest (rights) and in return, farmers agree not to develop their land in perpetuity. The program gives farmers the opportunity to invest back into

their farms or to settle estate matters with heirs. Presently, Suffolk County owns the development rights to 6,280 acres of agricultural land.

The Agricultural and Farmland Protection Plan (Suffolk County Agricultural and Farmland Protection Board, 1996) states that Suffolk County has had a large decline in the amount of farmland over the last several decades and continues to see a rapid decline in farmland today in spite of conservation efforts. The Plan downgraded the initial goal of farmland protection in Suffolk from 35,000 acres to 20,000 acres. According to the New York Agricultural Statistics Service, about 35,858 acres of Suffolk County land was farmed in 1997. Ten percent of the total land area in the Peconic Estuary watershed (14,539 acres) was agricultural land in 1995, most of which is still located on the north fork (SCPD, 1997). Undoubtedly there are fewer acres of farmland in Suffolk County now than in 1997 and 1995. The Suffolk County Farmland Protection Plan further states that at the present rate of agricultural land loss, there will be only 10,000 acres left in Suffolk in 2012.

Areas at the outskirts of large metropolitan regions are under the greatest threat of losing their farmland resources to sprawl, houses, and commercial developments. This is well documented across the nation. The American Farmland Trust ranked Suffolk County as the 18th most threatened agricultural county in the nation.

While recent efforts to secure new funding for farmland protection have been successful, there is literally a race against time to secure the preservation of critical farmland in eastern Suffolk against the backdrop of ever escalating land values tempting farmers to cash out.

High land values coupled with New York State's continued reliance on property taxes to fund government operations increase the opportunity costs of farming. The fixed costs associated with farming add to the problem and create a situation likely to: 1) accelerate the need to adopt high value-added strategies to support farm enterprises, and 2) drive more marginal commercial farmers out of business.

The future of agriculture is also threatened by the high degree of reliance on rented land for farming in Suffolk County. An estimated 60 percent of Suffolk County farmers rent land. Farmland owners who seek rental payments sufficient to cover property tax obligations will force farmers in turn to seek ever higher value and more land-intensive (*e.g.*, with possible greater environmental impacts) crop production methods. As development pressures increase, so do incentives for conversion of rented farmland to alternative uses (*i.e.*, development and golf courses).

Yellow Wood Associates (YWA), under contract with the Town of Southampton to update the town's agricultural section of its comprehensive plan in 1995, found that agriculture in Southampton has evolved in response to market demand. Agriculture now includes horse farming, nursery and greenhouse production, potatoes, vegetables, sod production, vineyards, duck farms, pheasant farms, orchards, small fruits and row crops. There is an increased emphasis on direct marketing from roadside stands and farm services such as winery tours, horse boarding, breeding, training and riding lessons. These conclusions can be applied to the entire East End.

Citing trends common to areas like the East End, YWA identified the transformation from a commodity-based production to a (mostly) land intensive production of high value crops that can be differentiated in the market. This trend is underway in many urban fringe areas in the northeast and, in fact, represents a kind of agricultural resurgence (See **Attachment H-3**).

Environmental Concerns

Conventional farming practices are typically fertilizer (nitrogen) and pesticide dependent. Nitrogen is a major management issue for the Peconic Estuary Program, since nitrogen contributed from fertilizers has already resulted in adverse environmental impacts, such as depressions in dissolved oxygen (see Nutrient Chapter). Nitrogen is soluble and is particularly mobile in Suffolk County's highly permeable soils. While fertilizers and pesticides have resulted in an increase in crop biomass, much of the byproducts are carried into the estuary by groundwater and, locally, by stormwater runoff.

Overall groundwater total nitrogen loading to the Peconic Estuary is approximately 6,500 pounds per day, about 32 percent of which occurs in the western estuary (Peconic River and Flanders Bay groundwater-contributing area). The dominant sources of total nitrogen to the estuary are agriculture (41 percent of the TN loading) and residential development (40 percent of TN loading). Agriculture has a per-acre TN loading rate of about double the residential land in the study area (SCDHS, 1999). Loading rates for various land uses are illustrated in **Figure H-1**.

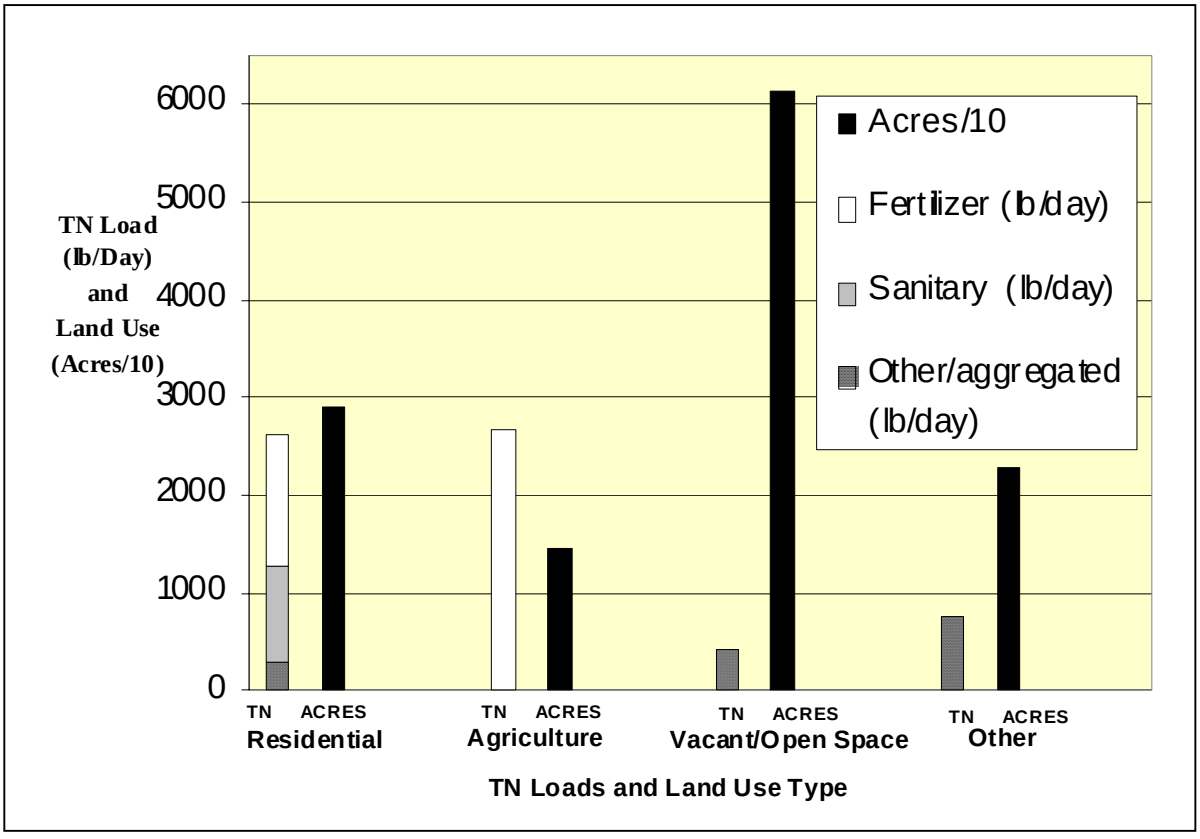

Figure H-1. Total Nitrogen (TN) Load by Land Use.

Public Health

Many studies indicate that nitrogen from synthetic fertilizer is the most important source of nitrate in groundwater. Ingestion of water with high nitrate levels is known to cause methemoglobinemia in infants under one year of age. In addition, the Centers for Disease Control has reported two episodes

of an association between first trimester miscarriages and elevated nitrate concentrations in the drinking water.

The SCDHS monitored ten wells that were primarily down gradient from agricultural land over a 22-year period (SCDHS, 1996). For the 20 year period 1975 through 1994, the average annual nitrate concentration for all ten wells was 11.3 mg/l. The ten well annual averages ranged from a minimum of 9.2 mg/l in 1982 and 1984 to a maximum of 13.7 mg/l in 1988. The EPA and New York State drinking water Maximum Contaminant Level (MCL) for nitrate is 10.0 mg/l.

The impact of agriculture on nitrate concentrations is also reflected in the results of private well testing by the SCDHS. The SCDHS tested 45,985 private wells between the years 1972 and 1994. Of all the private wells tested, 7.4 percent exceeded the nitrate MCL (SCDHS, 1996). The percentage of private wells exceeding the nitrate MCL was significantly greater in the agricultural communities than the countywide average.

Agricultural pesticides have also found their way into Suffolk County's groundwater. Concentrations of the carbamate pesticides, including Aldicarb (Temik), carbofuran (Furadan), and oxamyl (Vydate), have been detected in Suffolk County's monitoring wells but have steadily decreased since their ban in 1979 and 1982. The dacthal metabolite TCPA can be found in some areas despite its removal from the Suffolk County market in 1988. In 1999, the SCDHS concluded an 18-month study of pesticide contamination in the groundwaters of Nassau and Suffolk Counties (SCDHS, 1999). Wells were chosen for testing based upon a variety of considerations including selecting wells that had shown detectable traces of pesticides in previous monitoring. Other criteria included land use type, geographic coverage, and random selection. Of the 1,901 wells tested in Suffolk County, Aldicarb metabolites were the most frequently detected pesticide, followed by the dacthal metabolite TCPA, 1,2-dichloropropane, metalaxyl, and metachlor. These are all agricultural chemicals with the exception of TCPA, which is also used on turf and residential lawns. There were 191 wells found to exceed pesticide MCLs of which 91 percent were impacted by agricultural chemicals (including nursery and sod uses). The towns found to have the greatest percentage of pesticide impacted wells are Southold (51 percent), Riverhead (38.7 percent), and Southampton (34.5 percent); these towns also contain the bulk of Long Island's remaining agricultural land. In response to the pesticide problem, the NYSDEC has recently created a committee to reduce pesticide usage.

Estuarine Health

Excessive levels of nitrogen can be harmful to the estuary. When nutrients are introduced to the estuary at higher than normal rates, they can stimulate aquatic plant growth, including plankton and larger communities of macroalgae. Algae consume oxygen (respire) at night, potentially depleting dissolved oxygen levels in the water column. Also, when algae die, they can settle through the water column to the sediments, where the organic matter is decomposed by bacteria. Bacterial decomposition uses oxygen ("sediment oxygen demand"), as well as releases nitrogen back into the water column ("sediment nutrient flux"). Processes such as diurnal DO depression, sediment oxygen demand, and sediment nutrient flux can result in dissolved oxygen levels which are low enough to be harmful to marine life.

Currently, the estuary is not experiencing widespread low dissolved oxygen levels related to nitrogen loading. However, the western portion of the system (Peconic River and Flanders Bay) has a legacy of nutrient over enrichment and periodic, short-term dissolved oxygen problems. According to the Nitrogen Loading Budget and Trends Report (SCDHS, 1999), nonpoint source loading of nitrogen

has risen dramatically over time, far outweighing historic point source nitrogen loading from duck farms. Considering the trends of nutrient enrichment in the region, implementing nitrogen reduction strategies is critical.

The increased production of microscopic algae caused by increased nutrient enrichment results not only in dissolved oxygen problems but also discolors the water, decreases water clarity and diminishes the amount of light received by rooted aquatic plants (*i.e.*, eelgrass). Submerged aquatic vegetation beds serve as a prime habitat for juvenile fish, a food source and bottom stabilization. Aquatic plants that are at a species' depth limit for clear water conditions would be expected to decline due to the lack of sufficient light energy in turbid waters. Excessive influxes of nutrients will also increase the growth of epiphytes on eelgrass blades, again shading the plant itself and hindering production. Furthermore, species such as red or green macroalgae, which adsorb nutrients more quickly than eelgrass, may competitively exclude eelgrass plants. It is also thought that the lack of a mechanism to terminate nitrate uptake in eelgrass coupled with excessive nitrate in the system results in impaired plant health and a decline in eelgrass shoot production (Cashin Associates, 1996).

Nitrogen levels may also be linked to the Brown Tide. While data suggest that gross concentrations of nitrogen do not trigger blooms, the relative concentrations among the various forms of nitrogen may play a role in Brown Tide blooms. One theory holds that increases in nitrogen in groundwater may play a role in triggering Brown Tide blooms.

Though no causal link has been identified, low levels of pesticides may be affecting aquatic resources, including eelgrass, sensitive larval stages of commercially and recreationally important finfish and shellfish, and other ecologically important species.

Recommendations

The Committee's recommendations are shown in **Table H-1**, which also includes a designation of responsible entity, cost, and timeframe for each recommendation. The following discussion provides additional background and details regarding the recommendations.

Table H-1. Agricultural Nitrogen Committee Interim Workplan Actions.*

Action		Responsible Entity	Timeframe	Cost *	Status
AgN-1 Priority	Develop a Long Island component to the New York State Agricultural Environmental Management (AEM) program.	NYS Dept. of Agriculture & Markets	2000	$250,000–$500,000 for program development (estimated)	R
AgN-2	Identify potential pilot projects to demonstrate Best Management Practices and test them.	Suffolk County & Cornell Coop. Extension	2001	To be determined	C
AgN-3 Priority	Investigate the creation of a farm insurance plan.	PEP Agriculture Nitrogen Management Committee	2000	To be determined	R
AgN-4 Priority	Provide funding for increased local AEM development and implementation.	USDA NRCS, Cornell Coop. Extension, SC Soil and Water Conservation District, Suffolk County & NY State	2000	$175,000/year for staff at SCSWCD; $175,000/year for staff at CCE $1 million annually for implementation start up (from NYS Bond Act, Suffolk County ¼% Sales Tax, and funding sources in AgN-5); Long-term to be determined.	R
AgN-5 Priority	Investigate and implement innovative/alternative finance mechanisms for education and outreach, and actions 1-4.	NY State: fertilizer/pesticide tax; subsidizing capital improvement loans from EFC	2000	To be determined	R
AgN-6	Gather and analyze economic data on a regular basis and continue to promote and integrate economic analyses and support mechanisms into the AEM initiatives	PEP Agriculture Nitrogen Management Committee	2001	To be determined	R

C = Commitment R = Recommendation

*Note: Actions and costs are also contained in the Nutrient Chapter of the PEP CCMP.

Task I The New York State Agricultural Environmental Management Program (AEM)

New York State Department of Agriculture and Markets and the New York State Soil and Water Conservation Committee manage the New York State Agricultural Environmental Management Program wherein whole farm management plans are undertaken with farm operators to reduce environmental impacts. This program has focused on the livestock farmers in upstate New York, with an emphasis on phosphorus reduction and little emphasis on nitrogen reduction (Long Island's primary issue). Total AEM State funding for 1999 was 4.5 million dollars, but the program was still oversubscribed. Expanding this program for Long Island will require a one-time estimated commitment of $250,000–$500,000 of State funds. This cost estimate deals with program planning, design, and development, and *not* implementation, which is discussed below.

The current AEM program is the preferred model for nutrient and pesticide reduction in the Peconic Region since enhancements can be added to the conventional AEM program to satisfy Long Island's program requirements. In a high cost area, like Long Island, AEM must be enhanced with incentives to be viewed as a viable working option to reduce nitrogen and pesticides. The tax credits, cost sharing, and the program itself should be enticing enough so that 90 percent of the farmers working the remaining agricultural acres within the watershed are participating by 2005.

A Long Island AEM Plan outlining the management objectives and the available financial incentives will be developed. The plan will be prepared by the U.S. Department of Agriculture – Natural Resources Conservation Service (USDA–NRCS), Suffolk County Soil and Water Conservation District (SCSWCD), Cornell Cooperative Extension (CCE), and other stakeholders and approved by the New York State Department of Agriculture and Markets and the New York State Soil and Water Conservation Committee. Farmers would than be eligible to have whole farm management plans prepared for them with respect to the LI AEM Plan. Practices such as fertilizing, pesticide application, irrigating, and soil testing would be examined and then a financial/feasibility plan would be prepared showing the farmer how the recommended actions could be financially undertaken.

An ambitious Agricultural Environmental Management (AEM) Initiative program has already been piloted in the Peconic Estuary. Using the AEM approach, a comprehensive inventory and analysis was conducted for most farms within one subwatershed to assess the potential impact the farms may have had on that part of the Peconic Estuary and shallow aquifer. Plans were developed for high priority farms and best management practices (BMPs) were implemented. A total of 13 farms within the watershed implemented the high priority BMPs.

This pilot effort and other limited and localized efforts have been targets for agricultural environmental management by the USDA Natural Resources Conservation Service and the Suffolk County Soil and Water Conservation District. Their success is a promising foreshadowing of a much-needed regional program.

The task before the Peconic Estuary Management Conference is to manage for improved environmental practices without driving farms out of business. Any discussion about environmental improvements should be incentive-driven as it relates to the burdens placed on the farmer. More applications of the same products at reduced loading rates and other best management practices may reduce total pollutant loadings but increases farm operation costs

in terms of fuel, labor, wear on equipment, etc. Since it is within the public interest to seek changes in agricultural practices, the public should offer several incentives to farmers that carry out the recommendations of their whole farm plans. The tax credits option is consistent with school district tax relief practices that the State legislature has provided to farmers.

A recent study by the Northwest Area Foundation compared certain conventional farming practices with aggressive AEM-based approaches. That study concluded that the cost of chemicals decreased in certain instances while labor and managerial costs rose in some cases. Sustainable farming tends to be more labor-intensive than conventional farming. This translates into greater job creation potential. Diversification leads to a more even distribution of labor requirements throughout the year.

Other States have achieved substantial reductions in nutrient loadings as a result of their investment in AEM.

Task II Pilot Projects

To initiate the AEM effort as soon as possible, pilot projects will be identified and carried out. One pilot site that has already been identified is at the Suffolk County Yaphank research farm; others will be sought, as well. Possible pilot projects include:

- Evaluation of fertilizer and pesticide application rates as related to crop yield and quality, as well as leaching rates and pollution potential. Fertilizer trials (CCE) with potatoes show that a substantial reduction in nitrogen can be obtained with no reduction in yield. Overall, nitrogen reductions in the range of 10 to 30 percent are believed to be feasible for most crop types (except grapes and grain);
- Utilization of slow release nitrogen fertilizers. Most suited for nursery stock and longer term crops;
- Irrigation evaluations for water efficiency and nitrogen loads;
- Zero discharge nursery greenhouses currently exist. Others could be retrofitted but new equipment costs money;
- Best management practices for pesticides (IPM);
- Soil testing;
- Pesticide storage handling and application equipment evaluations should be undertaken with a specific intention of improving handling practices etc.;
- Stormwater runoff mitigation practices, including soil loss and erosion control; and
- Agricultural wellhead protection.

Task III Farm Insurance Plan

There is a perceived risk in trying unfamiliar farming practices instead of the accustomed methods. Although proven by researchers and innovative farmers, most growers are reluctant to adopt new practices, even when crop costs can be reduced, because of concerns about yield variability. Necessary to any real environmental improvements is making certain that risks to the farmer in implementing these procedures could be neutralized, possibly by creating a farm insurance program.

The farm insurance plan could be modeled after the Mississippi Soil Conservation District and Campbells Corporation private-sector crop insurance programs. They were designed to raise the comfort level of new farmers participating in conservation programs that depart from traditional farming practices. Similarly, the Agricultural Conservation Innovation Center, in cooperation with the IGF Insurance Company, has designed insurance coverage to help farmers adopt conservation practices (see **Attachment H-5**).

The USDA has undertaken the development of an Adjusted Gross Revenue (AGR) insurance plan to provide an insurance safety net for multiple agricultural commodities in an insurance product. The AGR plan was piloted in New England last year. The USDA intends to expand this program to 16 counties in New York State, including Suffolk County. The AGR insurance plan will replace the Federal government disaster program of the past and the crop insurance which growers found much too expensive for anything near adequate coverage. The AGR plan is not the same as reduced losses due to new practices, however the principles of the plan may be applicable to the proposed farm insurance plan.

Task IV AEM Implementation

The Federal, State and county governments must expand their operating budgets to provide for more staff at the USDA–NRCS, CCE, and SCSWCD to provide technical support to develop 1) the regional plan, 2) whole farm plans and 3) initiate necessary pilot demonstration projects. Respective budgets should appropriate two more staff persons at SCSWCD at $175,000 per year, and 2 more staff at CCE at $175,000 per year specifically for this Committee's initiatives (figures include salaries, benefits, associated equipment and space needs).

In terms of funding to support implementation of the LI AEM, the program should be financed by New York State with at least a $1 million commitment. The New York State Bond Act, Environmental Protection Fund, the new 1/4 percent sales tax water quality improvement fund from the non-point source pollution category, and Suffolk County Capital Funds are all reasonable candidates for additional funding for implementation.

Another option for securing funding to implement AEM plans designed for specific farms is the Suffolk County Farmland Development Rights Program, which is authorized and administered in accord with the criteria in *Laws of Suffolk County*, Volume 1, Part III, Administrative Local Laws, Chapter 8, Development Rights to Agricultural Lands (pp. 801-806). This program is currently limited to the expenditure of funds for the purchase of non-farm development rights in response to recommendations made by the Suffolk County Farmland Committee.

Suffolk County should evaluate the potential and utility of amending Chapter 8 to authorize the payment of additional funds to a willing seller of development rights so as to encourage participation in the AEM program for a specified time period. This offering could be linked to farms in watershed areas that have been identified as having significant impacts on Peconic Estuary water quality, and to farms located within 1500 feet of the regional groundwater divide in order to protect drinking water supplies. The new 13-year, 1/4 percent sales tax extension program will have a funding stream dedicated specifically for purchase of development rights to farms. If authorized, yearly participation payments from this fund could be made to farmers who implement AEM farm plans.

Task V Finance Mechanisms

While some finance mechanisms are noted above (New York State Bond Act, Environmental Protection Fund, the new 1/4 percent sales tax), several other conventional and innovative/alternative finance mechanisms need to be investigated to fund education and outreach, as well as the other tasks. For example, crop insurance, additional personnel, and tax credits could be financed by levying a small fee on all fertilizer and pesticide sales at the wholesale to retail distribution level in Suffolk County. A well-developed marketing and public outreach program targeted to homeowners and larger users should also be developed with these funds. Aspects of this educational program should be extended to large institutional users such as golf courses (See **Attachment H-6**; the Michigan Groundwater Stewardship Program and the Northwest Michigan Groundwater Stewardship Program, both financed by a small fee on nitrogen and pesticides).

Another topic raised by the Committee includes subsidizing capital improvement loans for farms from the Environmental Facilities Corporation. This and other mechanisms need to be explored more fully.

Task VI Gather and analyze economic data

Economic data need to be gathered and analyzed on a regular basis, and the Committee needs to continue to promote and integrate economic analyses and support mechanisms into the AEM initiatives. Ideas posed by the Committee include securing an agricultural economist and creating a Farm Development Agency.

Summary of Costs and Benefits

Developing a LI AEM program will require an estimated commitment of $250,000 to $500,000. While the cost of long-term implementation of the plan is unknown, $350,000 is needed to fund additional staff at CCE and SCSWCD for agriculture-related issues, and a minimum of $1 million is required to support initial implementation efforts. The costs of providing State tax credits to farmers, conducting pilot projects, and developing and implementing farm insurance plans have not yet been developed.

Environmental benefits of nutrient management are well documented in the PEP CCMP, and include attainment of dissolved oxygen standards throughout the estuary. Other benefits include public health/drinking water considerations (attainment of standards), as well as support of a sustainable agricultural community, which is essential to the economy and quality of life in the Peconic Estuary watershed.

Conclusions

AEM enhanced with tax credits as presented herein can be initiated now. If so, it will accelerate the conversion of conventional agriculture to lower impact practices. This may lead to organic, community-supported agriculture and niche farming or other innovations. A successful AEM program will result in less pollution to the groundwater, and consequently the Peconic Estuary, and reduce pesticide use in the region by providing direct economic incentives to farmers.

YWA concludes its report by stating, "Sustainable farming is not universally financially sustainable or profitable. The crucial factor in financial sustainability is good management, particularly necessary since many sustainable farms are highly diversified. Ecological sustainability in agriculture requires use of modern, emerging technologies that are information-driven and management centered. Sustainable agriculture requires a highly adaptive management technology that responds to the ecology of the farm, and will spread as environmental constraints grow. The ability to farm sustainably will be in increased demand as environmental constraints grow because it has real and measurable environmental benefits."

The State and the County have robust economic development programs, investing millions of dollars each year. In order to address AEM correctly we must augment this effort to other agricultural-related economic assistance programs in order to fully support the conversion of the region's current agricultural economy to one that is more environmentally harmonious with groundwater and surface water protection issues.

References

Cashin Associates, P.C., (January, 1996). *Peconic Estuary Program Final Submerged Aquatic Vegetation Study.*

Economic Analysis, Inc., (February 1999). *Resource and Recreational Economic Values for the Peconic Estuary System.*

Suffolk County Agricultural and Farmland Protection Board (June 1996). *Agricultural and Farmland Protection Plan*. Report prepared by the Suffolk County Department of Planning. Hauppauge, NY.

Suffolk County Department of Health Services Office of Ecology, (January 1999). *Peconic Estuary Program — Nitrogen Loading Budget and Trends, Major, External, Anthropogenic Nitrogen Sources: Groundwater and Duck Farms.*

Suffolk County Department of Health Services Bureau of Groundwater Resources, (September 1996). *Nitrate and Pesticide Impacts of Agriculture on Groundwater Quality, Suffolk County, NY.*

Suffolk County Department of Health Services Bureau of Groundwater Resources, (March 1999). *Water Quality Monitoring Program to Detect Pesticide Contamination in Groundwaters of Nassau and Suffolk Counties, NY.*

Suffolk County Department of Planning, (January 1997). *Peconic Estuary Program Existing Land Use Inventory.*

ATTACHMENT H-1

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AGRICULTURAL NITROGEN MANAGEMENT COMMITTEE MEMBERSHIP

Name	Agency
George Proios, Chairman	Suffolk County Executive Office/Suffolk County Soil & Water Conservation District
Kevin McDonald, Co-Chairman	Group for the South Fork/Peconic Estuary Program CAC
Bill Sanok	Cornell Cooperative Extension
Joe Sieczka	Cornell Cooperative Extension
Mary Barbato	East End Initiative
Mary McGlone	East End Initiative
Joe Gergela	Long Island Farm Bureau
Marci Bortman	The Nature Conservancy
Stuart Lowrie	The Nature Conservancy
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Matthew Sclafani	New York State Department of Environmental Conservation/Peconic Estuary Program
John Wildeman	New York State Soil and Water Conservation Committee
Debbie O'Kane	North Fork Environmental Council
Susan Dodson	Suffolk County Department of Health Services
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Other Contributors:
Long Island Agricultural Stewardship Working Group
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Town of Southold

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ATTACHMENT H-2

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NITROGEN LOADING RATES AND POTENTIAL REDUCTIONS*

Category	Fertilizer Load Rate Reduction (lb N/ac/yr)	Potential (%)
Vineyards	40	5-10
Mixed Vegetables	125-175	10
Potatoes	150-200	10-20
Orchards	60-80	20
Nurseries	160-250	20-30
Sod**	250	25
Grain	0-50	0
Greenhouse (inc. Container Stock)	***	–
Field Corn	120-180	15
Christmas Trees	160-200	20

* All values result from the publication "Protection and Restoration of Groundwater in Southold, NY" Cornell University C.E.R., April 1983, Draft, and subsequent discussions with the Long Island Agricultural Stewardship Working Group Meeting at the Cornell Cooperative Extension of Suffolk County on June 22, 2000.

** Sod values were further refined with input from Tamsen Yeh from the Cornell Cooperative Extension of Nassau County in July and August, 2000.

*** Approximately 80 percent of container stock greenhouses use slow release fertilizers instead of liquid feeding.

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ATTACHMENT H-3

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AGRICULTURAL TRENDS ANALYSIS FOR TOWN OF SOUTHAMPTON

Yellow Wood Associates (YWA) analyzed the existing agricultural and fisheries resources and developed recommendations for fostering an economically and environmentally viable climate for the natural resource-based economy of Southampton, New York. They identified several important components to changes in the agriculture industry. The major components of their trends analysis are listed below and incorporate a strategy to assess capacity and develop a response strategy.

1. The transformation from commodity production to specialty crop production may contribute positively to environmental sustainability. This will depend, in large part, on the capacity of farmers to employ more information and management-intensive approaches to production. Farmers will need to have the financial capital to invest in modern technologies. This transformation will depend as well on continued growth in consumer demand for organic or "green" products and services.

2. Diversification of agricultural production will increasingly include service provision in tourism, recreation and education, whether through direct marketing (*e.g*., roadside stands, pick your own) or activities such as farm vacations, school field trips, riding lessons, hay rides, wine tasting events or farm tours. There are two reasons for this trend. First, services provide an additional income opportunity to farmers who face ever-higher costs of production. Second, consumers rank the ocean as their #1 most popular vacation setting, followed in third place by rural destinations.

3. The long-term success of agriculture, based on product differentiation and services depends heavily on economical provision of appropriate infrastructure (*e.g*., parking, signage, and sewage disposal) and market infrastructure development in both retail and wholesale markets. Market diversification is as important as product diversification to ensure the long-term viability of agriculture. East End farmers must be able to capture local sales and tap more distant markets as appropriate.

4. One of the substantial challenges facing agricultural entrepreneurs is that of matching the scale of production to market demand. Another is in securing the range of professional services from translating to graphic design, labeling, packing, transportation and pricing information required to survive in a highly competitive marketplace. A third is developing the supply relationships, market relationships and information systems needed to meet demands for "just-in-time" deliveries. Advantages to the East End farmers include proximity to major markets, but proximity alone is not enough to ensure marketing success.

5. The requirements of agricultural diversification into specialty products and related production and marketing requirements can lead to increased vertical integration of farm operations.

6. Diversified agricultural activity, with a significant service and processing component, will require new approaches to land use regulation.

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IATP'S NUTRIENT MANAGEMENT YARDSTICK

The Institute for Agriculture and Trade Policy (IATP) uses a Nutrient Management Yardstick to promote on-farm efficiency and environmental protection for use on Minnesota farms. This is a summary of that program.

Summary

The Nutrient Management Yardstick measures nutrient inputs and outputs that go beyond the farm boundary. An imaginary boundary is drawn around the farm, so that nutrients that remain on the farm are not counted; but those that enter or leave the farm boundary are measured. Nutrients that enter the farm from beyond the boundary include nitrogen in rainfall, feed and livestock inputs, fertilizer and manure inputs, nitrogen-fixing plants, and nitrogen in irrigation water. Nutrients that leave the boundary may include exported crops, volatilization and denitrification into the atmosphere, runoff into surface water, and leaching into groundwater.

The project, based on a successful Dutch program, is in its second year in the United States and Canada. The Yardstick is a bookkeeping tool to help farmers understand and better manage the flow of primary nutrients (nitrogen, phosphorus, potassium) on their farms. By providing farmers with a method of measuring nutrient utilization, unnecessary inputs can be eliminated, reducing costs as well as excess nutrients flowing to the environment.

Excess nutrients are measured using a simple equation: inputs — outputs = excess nutrients. The farmer completes worksheets, entering estimated figures, and calculates a score that indicates the pounds per acre of excess nitrogen, phosphorus, and potassium on the farm. Cash-grain farms tend to have minimal (-50 pounds per acre) nutrient excesses. Scores are used by the farmer to more fully understand the nutrient flows on the farm; since conditions vary from farm to farm and year to year, the scores should not be used for comparison purposes. The Yardstick is not a regulatory tool; scores are kept confidential.

Determining Nutrient Outputs

Crop farmers need the following information to complete the worksheets:

- amount of fertilizers used;
- amount of crops that left the farm;
- if legumes are grown, the acreage, cutting, and type of stand; and
- if irrigation is used, the nitrate content and volume of water used.

The program describes how to convert the dry matter weight of crop products that were sold or removed from the farm and determines the nutrient content of sold crop products. A useful chart of nutrient contents of common crops and forages is included. The farmer then determines the nutrients in purchased fertilizer and manure and the nitrogen fixated by legumes. Finally, environmental inputs are estimated from deposition and irrigation water.

Once all known factors are figured in, the farmer totals all nitrogen, potassium, and phosphorus inputs and outputs, then determines the difference. The final result is a score for excess pounds per acre for each of the three nutrients.

SIGNIFICANCE OF SCORES

The closer a yardstick score is to zero, the more efficient is the on-farm nutrient use. The document includes criteria that increase or decrease efficiency, and fertilizer data.

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BMP-PLUS™: INSURANCE COVERAGE FOR INNOVATIVE PRACTICES

Conservation Practices Could Be More Widely Adopted if RISKS Could be Neutralized

Best Management Practices (BMPs) are research-proven, cost-reducing farming methods designed to optimize crop income while protecting the land. Yet it is hard for farmers to change the way they farm. They stick with accustomed methods because of concerns about yield variability that tend to outweigh either cost-cutting appeal or environmental impact reduction concerns. Until farmers have seen that the risks have been worked down, they continue to use current practices.

THE BMP-PLUS™: Conservation Innovation Policy

To boost adoption of proven conservation techniques, the Agricultural Conservation Innovation Center (ACIC) has designed insurance coverage for innovative practices. The approach uses split fields (or orchards) to isolate the risk. The innovative steps are followed on one half while conventional methods are used on the other. All other practices must be identical across the split field system to make sure that the conservation practice is the only thing that is different in the two portions. The yield difference between the two halves is insured.

Sponsoring organizations play a pivotal role. Proposals originate with them and they screen participants. They identify technicians who'll guide growers as the innovative practice is implemented. They track yields, analyze differences in the split field results, and help process any claims.

ACIC empanels expert committees to evaluate conservation practices for their suitability. Other criteria may become evident as proposals are processed.

A Specialized Insurance Policy Can Resolve This Dilemma

To boost adoption of proven conservation practices, the ACIC and IGF Insurance Company have designed insurance coverage to help farmers adopt conservation practices.

How It Works and What It Costs

1. A split field approach is commonly used to demonstrate a different practice or product. For BMP-PLUS™ split fields will be used to isolate risk in proven conservation methods. The innovative procedure is followed in one half while conventional methods are continued in the other. All other farming practices must be identical across the split field system to make sure that the conservation practice is the only thing that is different. Yield variance between the two halves is then insured neutralizing a grower's risk as innovative conservation practices are adopted.

2. The BMP-PLUS™ insurance will have premiums set at 50 percent of the established Multiple Peril Crop Insurance (MPCI) rates for any crop.

Sponsoring Groups

The enhanced AEM program proposed herein recognizes that the County and State (Department of Agriculture and Markets) have a bona fide stake in conservation. Their leadership makes the whole process work by:

- Identifying conservation proposals;
- Clarifying the benefits and the risks;
- Communicating with farmers;
- Screening farmer participants;
- Ensuring sufficient technical support; and
- Assisting in loss adjustment.

How the BMP-PLUS™ Policy Works

1. A bona fide conservation practice is identified (in this case, AEM practices);
2. Either a sponsoring organization persuades farmer members to enroll crop acreage or a producer persuades his organization to sponsor a proposal;
3. A simplified description of the conserving practice is submitted by the sponsoring organization to ACIC for an initial review;
4. ACIC reviews the concept and the needs, responding to the applicant organization with assistance in either making a full application or in obtaining more information and refining how the proposal may be specified more effectively;
5. The sponsoring organization:
    a. Nominates the producer participants;
    b. Vouches for the participants;
    c. Identifies the field support for farmers using the practice; and
    d. Certifies that the split fields have comparable productive capacity.
6. ACIC initially rates the insurance based on a non-probability premium structure developed jointly with IGF Insurance Company:

a. Empanels a vetting committee to assess the technical aspects of the proposal; and

b. Customizes the innovation insurance policy to fit the circumstances.

7. IGF Insurance Company writes and distributes the BMP-PLUS™ policy via agents;
8. The producer grows his crops according to the split field method;
9. The sponsoring organization provides technical support for enrolled producers and oversees the steps of the recommended conservation practice;
10. The sponsoring organization performs the initial adjustment process and prepares a preliminary report if a loss occurs and verifies that all other farming practices were consistent across both portions of the split field system; and
11. IGF Insurance Company performs the final adjustment process and pays out claims as necessary.

Source: Agricultural Conservation Innovation Center, 1999

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Michigan Groundwater Stewardship Program

Mission

To provide information and assessment tools for pesticide and nitrogen fertilizer users which help them identify risks to groundwater associated with their pesticide and nitrogen fertilizer use practices and to coordinate local, State, and Federal resources to help individuals reduce those risks.

The Michigan Groundwater Stewardship Program is designed to be voluntary, to be locally driven, to address the concerns of individuals, and to maintain a focus on the financial and technical constraints which drive real-world decisions.

The Michigan Groundwater Stewardship Program is relatively narrow in focus addressing only risks to groundwater associated with pesticide and nitrogen fertilizer use. However, it has a wide scope and addresses the many uses of these materials, including agricultural, turfgrass, and household uses.

Local Programs

Local Groundwater Stewardship Programs are being funded through a competitive grants program. Technical assistance personnel are hired to help individuals complete an on-site evaluation of risks and help implement practices which reduce those risks.

Farm *A* Syst (FAS)

Farm *A* Syst (FAS) identifies potential risks posed by farmstead operations. Fact sheets provide educational information and list reference people to contact if questions arise. F*A*S* work sheets use a simple question-and-answer format to evaluate farmstead practices that may pose a risk to groundwater.

Farm *A* Syst is voluntary and confidential. All Farm *A* Syst materials stay with you on your farm. It is important to recognize that Farm *A* Syst only identifies risk. It does not tell you if you have contaminated water or that you will never have contaminated water.

Technical assistance with completing Farm *A* Syst evaluations is available free of charge from the Michigan Groundwater Stewardship Program.

Home *A* Syst

Home *A* Syst helps homeowners identify and lower risks to groundwater and surface water, protecting human health and the environment. A home assessment system to help you identify and

lower risks to groundwater and surface water. Groundwater is a limited resource. Its contamination can occur in several ways:

- Contaminants moving down well casings of unused or unusable wells;
- Excess or poorly timed use of yard and garden fertilizers and pesticides, leading to groundwater or surface water contamination;
- Poorly maintained septic systems; and
- Improper disposal of wastes.

Groundwater Stewardship Practices

Technical assistance personnel may work with landowners to develop a Groundwater Stewardship Plan describing the cost-share and technical assistance resources available to implement Groundwater Stewardship Practices.

The practices not only provide easy-to-access information about reducing risks but also can provide technical assistance and cost-share for closing abandoned wells.

One-Stop Shopping

In the past, individuals have gone to MSU Extension for general information on implementation of the Groundwater Stewardship Practices. Then they would go to the Natural Resources Conservation Service for technical standards, visit the Consolidated Farm Service Agency for cost-share information, and finally work through the Natural Resources Conservation Service and the local conservation district to set up technical assistance and learn about other cost-share opportunities.

To address this problem, a series of Groundwater Stewardship Practice Manuals have been developed by the Michigan Groundwater Stewardship Program which integrate:

- MSU Extension descriptive information
- Natural Resources Conservation Service technical standards
- State and Federal legal requirements
- Information on State and Federal cost-share opportunities, and
- Evaluation tools.

Groundwater Stewardship Teams

These teams determine the mixture between cost-share, technical assistance, and/or demonstration provided by the local program. They ensure coordination of local resources and make sure the local program meets the groundwater protection needs of local pesticide and fertilizer users.

Groundwater Stewardship Teams (GST) are a part of Michigan's Groundwater Stewardship Program (GSP). They provide a collective voice of pesticide and nitrogen fertilizer users in determining the direction of the statewide program. GSTs help ensure that local information, technical assistance, demonstration projects and cost-share opportunities supported by the Michigan Groundwater Stewardship Program meet local needs and interests. They can also serve as local forums to

communicate the groundwater protection activities, needs, and concerns of the pesticide and nitrogen fertilizer users to the nonagricultural community.

Field *A* Syst

Field *A* Syst is designed to help individuals identify ways to reduce the risk of groundwater contamination associated with field applications of pesticides and nitrogen fertilizers.

Field *A* System is a series of worksheets and fact sheets that help identify and offer ways to reduce the risk of groundwater contamination associated with pesticide and nitrogen fertilizer use. These in-field risk assessment tools are based on the highly popular Farm *A*Syst program which is used to evaluate farmstead practices and structures that may pose a risk to groundwater.

Currently, Field*A*Syst materials are available for the following topics:

- General Pesticide & Nutrient Management Work Sheets;
- General Irrigation Management Field Screening Work Sheets; and
- Corn Nutrient & Pesticide Management.

The general pesticide, nutrient and irrigation management packages focus on practices such as: split nitrogen application, nitrate testing, pesticide selection, sprayer calibration, and pesticide safety.

The field screening worksheets help evaluate the impact of soils, subsurface geology, cropping practices, and depth to the water table on the relative vulnerability of the fields you manage. The idea is that if you are going to try using a groundwater stewardship practice, you'll get the biggest benefit using it on your most vulnerable fields.

The materials are designed to integrate MSU Extension bulletins and recommendations into a single fact sheet, using the same easy Farm*A*Syst question-and-answer format to help you apply the recommendations to your own fields. Just like Farm*A*Syst, the Field*A*Syst program is voluntary and confidential. All materials stay with you on your farm.

Funding

Funds for this program come from industry-supported pesticide and fertilizer registration fees on specialty and agricultural products. Registration fees are paid for by companies that register their products for use in Michigan. A tonnage fee on bulk nitrogen fertilizers is also a source of funding. Nitrogen tonnage fees are paid directly by bulk fertilizer users.

Pesticide registration fees account for about 72 percent of the revenues with the remaining being provided by nitrogen fertilizer users. Specialty (household) products generate approximately 40 percent of the total revenues with the remaining coming from agriculture and other wide-area pesticide uses.

Over 85 percent of the revenues generated by these fees are returned directly to pesticide and fertilizer users through education, technical-assistance, applied research, and cost-share programs.

Funding Revenues

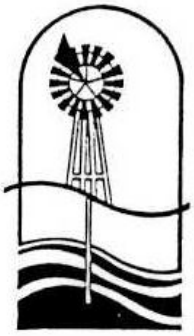
Funds for the Michigan Groundwater Stewardship Program come from industry-supported pesticide and fertilizer registration and tonnage fees.

Pesticide registration fees are paid for by companies which register both specialty (homeowner) and wide-area (agricultural, right of way, golf course, etc.) pesticides for use in Michigan. The rate for specialty pesticides is $100/product while the rate for wide-area pesticides is equal to three-quarters of one percent of the annual wholesale value with a $150/product minimum.

Specialty fertilizer registration fees are equal to $100 for each product and grade registered for sale. Nitrogen fertilizer tonnage fees are set at one-and-a-half cents per percent of nitrogen in each ton of fertilizer sold. For example, the fee on one ton of 28-0-0 would be 28 x .015 or $0.42. So, if 28-0-0 were selling at $160/ton, the groundwater fee would raise the price by two-tenths-of-one-percent.

Pesticide registration fees account for about 74 percent of program revenues with the remaining being provided by nitrogen fertilizer users. Specialty products generate approximately 40 percent of the total revenues with the remaining coming from wide-area pesticide uses.

Total annual revenues were about $2 million in 1994 and $3.5 million in 1995. Revenues not spent in one year are carried forward to fund the next year's programs and are not returned to the general fund.



Northwest Michigan
Groundwater Stewardship Program

The Northwest Michigan Groundwater Stewardship Program is here to be of service to you.
The Program offers:

- Farmstead Assessments (Farm*A*Syst);
- Homestead Assessments (Home*A*Syst);
- Cost-share Funding; and
- An Information Network/Partnership.

It's about Risk Reduction to improve the quality of our region's groundwater and your personal groundwater supply. This program is funded through PA216 of 1994, which assesses a surcharge on nitrate fertilizers and pesticides. The revenues generated are to be used to help farmers and homeowners to undertake management changes that will reduce the threat of groundwater contamination on their property. The bulk of the grant funds will be used to deliver on-site technical

assistance to landowners and to provide cost-share funds to landowners for closing abandoned wells, installing anti-backflow devices on agricultural wells and implementing other practices that protect groundwater.

Groundwater Facts and Trivia

- The earth is a closed system; there is the same amount of water here today as there was three billion years ago;
- Water moves through the hydrologic cycle, changing from solid to liquid to gas (water vapor) over and over again;
- Ninety-seven percent of the earth's water is salt water, only three percent is fresh water. Of the freshwater, 77 percent is frozen in ice and glaciers, 22 percent is groundwater, and less than 1 percent is found in lakes, marshed, rivers, and streams;
- About 95 percent of the United States' total supply of fresh water is groundwater. The remaining is surface water found in lakes and streams;
- About 27 trillion gallons of groundwater are withdrawn for use in the United States each year;
- Three-quarters of the cities in the United States use groundwater as part of their water supply. Almost 350 municipalities throughout Michigan use groundwater for their public water supply system;
- More than 800,000 new water wells are drilled in the United States each year;
- Unconsolidated sands and gravels compose nearly 90 percent of all aquifers developed for water supplies. Porous sandstone, limestone, and highly fractured crystalline and volcanic rock make up most other aquifers;
- Forty-three percent of Michigan's residents depend on groundwater for drinking;
- Thirty-seven percent of Michigan's farmers use groundwater for irrigating crops and watering livestock;
- Groundwater supplies water to many of our streams, lakes, and wetlands. In fact, about 30 percent of stream flow in the U.S. is from groundwater discharge;
- Rainfall is the main source of fresh groundwater. About 25 percent of rainfall in the United States becomes groundwater. That is equal to about 300 trillion gallons per year;
- Groundwater is constantly moving. The rate of movement may be as fast as 50 feet per day or as slow as 50 feet per 500 years;
- Groundwater nearly always contains more mineral matter than nearby surface water, but is generally much cleaner;
- About a quarter of the Earth's population drink contaminated water;
- The two major groundwater problems are overdraft (withdrawing more water than is being naturally replenished), and unnatural contamination;
- Since water will dissolve more things than any other substance it is very susceptible to contamination;

- Groundwater contamination has been found in every State. Groundwater is known to be contaminated at about 1,300 sites in Michigan;
- Agricultural activities constitute the single largest use of groundwater; and
- Approximately one-fifth of the earth's fresh water is contained in the Great Lakes Basin.

*Farm*A*Syst*

A Farm*A*Syst is an assessment to help identify potential risk of groundwater contamination posed by farmstead operations. Fact sheets provide education information. F*A*S worksheets use a simple question-and-answer format to evaluate farmstead practices that may pose a risk to groundwater. A groundwater technician will come out to the farm and work with you to identify practices which would help reduce the risk of contamination on you farm and develop a Groundwater Stewardship Plan.

Farm*A*Syst areas which are addressed are:

- Well location and condition;
- Pesticide and/or fertilizer storage and handling;
- Fuel storage (see EQIP info for cost-share info);
- Hazardous waste management;
- Household and milking center wastewater treatment;
- Livestock manure storage;
- Livestock yard management;
- Silage storage;
- Emergency preparedness planning; and
- Overall farmstead assessment.

After doing a Farm*A*Syst, one is eligible to apply for cost-share funding to help implement safer groundwater practices. For more information about the Farm*A*Syst program, please contact Ginger Bardenhagen at (616) 941-4191 or email her at: spice@northlink.net.

*Home*A*Syst*

Home*A*Syst is a home assessment system to help you identify and lower risks to groundwater and surface water. The packet fact sheets can be done alone or with assistance and cover the following topics:

- Drinking Water Well Management;
- Yard and Garden Care;
- Household Wastewater;
- Stormwater Management;
- Hazardous Household Products;
- Household Trash;
- Liquid Fuels; and
- Homesite Assessment.

The assessment will allow you to:

- Protect your drinking water;
- Learn the basics about your home septic system;
- Reduce runoff which may harm lakes and streams;
- Gain information on the health and environmental impact of your yard and gardening activities;
- Lower risks from hazardous household products;
- Reduce and improve handling of household waste; and
- Safely manage liquid fuel storage (gas, fuel oil, kerosene, etc.).

For more information or for a Home*A*Syst packet contact:

Kelly Wood-Arnold
Phone: 616-935-1514
Fax: 616-922-4633

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