



Watershed Agricultural Council

EAST of HUDSON

P R O G R A M



H A N D B O O K

Watershed Agricultural Council

www.nycwatershed.org



The WAC is funded by the New York City Department of Environmental Protection, U.S. Forest Service, U.S. Department of Agriculture and other federal, foundation and private sources. The Watershed Agricultural Council is an Equal Opportunity Provider and Employer.



Watershed Agricultural Council

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PARTNERING FOR CLEAN WATER

We are pleased to welcome you to the Watershed Agricultural Council as a partner in our effort to protect water quality in the New York City Watershed region. Founded in 1993 and funded primarily by the New York City Department for Environmental Protection, the Watershed Agricultural Council or “WAC” embarks on a three-fold mission: to support the economic viability of agriculture and forestry while protecting water quality and promoting land conservation in the New York City watershed region. The WAC is not a regulatory agency and thus we are grateful for your voluntary commitment to join our program.

The New York City Water Supply Watershed is comprised of two separate watershed regions, one west of the Hudson River and one on the east side of the river. The Croton Watershed, or East of Hudson (EoH) portion, is the oldest and original watershed for the city, supplying its inhabitants since 1842. The East of Hudson Program of the Watershed Agricultural Council promotes the organization’s mission in the Croton region of the



New York City watershed, while the WAC's Agricultural and Forestry Program staff works with landowners in the Catskill and Delaware Watersheds. Due to the Croton's population density and limited presence of traditional agronomic and livestock farming activity, the EoH program and its participants encounter challenges that are often distinct from those occurring in the Catskill and Delaware Watersheds. In particular, the EoH



program looks to resolve water quality problems found when farming in the suburban fringe where development densities and agricultural land uses combine to pressure hydrologic resources and water quality. Equivalent challenges arise when forest management activity occurs in this region. The WAC is here to ensure the viability and protection of the working landscape and water quality at every step.

The WAC has actively worked within the Croton Watershed since 1997. By virtue of the area's predominant farming land use, WAC's agricultural program participants are primarily horse farm owners. However, the WAC also counts orchards, nurseries, and livestock operations among its agricultural program participants. Forest management participants are typically non-farming landowners who enjoy their forest acreage for its beauty, wildlife habitat, and privacy. A committee of local farmers and landowners advises our program's activities and budget. The EoH staff assists participants like you with all details of agricultural environmental management, from grazing techniques

to the installation of complex drainage and waste management solutions. Through the Agricultural Program, landowners partner with WAC to create a Whole Farm Plan, receiving technical guidance and funding for farm and water quality improvements. Through the Forestry Program, forest owners work with a consulting forester funded by WAC to create a tailored management plan incorporating such goals as forest preservation, timber production and wildlife habitat. Many participants join both programs.

How will you benefit by joining WAC in its water quality mission?

You may have decided to join WAC for any number of reasons, but most landowners join our programs because they want to:

- take a proactive role in protecting water quality on behalf of your family and the general public
- see the benefits of addressing water pollution at its source
- benefit from WAC-funded improvements made to their land, buildings, property and business operation
- learn how to better utilize and manage natural resources such as woodlots and grass pasture
- improve the overall quality of their land and farm business through healthier animals, increased production and improved product quality
- enhance relations with neighbors as a result of the improvements made to their property.

A WAC-landowner partnership is a win-win-win proposition: you improve your farm and forest lands, the WAC fulfills its mission, and the NYC water consumer drinks the high-quality result of this unique partnership.

Farms and Forests

Keeping Water Clean

The first part of our two-part mission, promoting farm and forest viability in the watershed, is accomplished by providing the best technical advice and assistance to you, the farm and forest landowner. This exper-



tise ensures that our farm and forest plans support your core business and its long-term success. Secondly, we focus on reducing the following pollutants from infiltrating the reservoirs and waterways that supply drinking water to New York City and many Westchester County and surrounding area residents:

- **Bacteria**, or water-borne parasites such as *Giardia lamblia* and *Cryptosporidium parvum*, that cause human intestinal distress, often referred to as **pathogens**;
- Animal waste and the accompanying volume of phosphorous and nitrogen, or **nutrients**, that use up available oxygen in the water and create a bacteria-friendly environment;
- **Sediment**, or the particles that muddy water through erosion, causes turbidity or cloudiness in water that can lead to the loss of aquatic habitat and an increase in bacteria growth;
- **Pesticides**, either through improper storage or application, can be transported into our streams and reservoirs;
- **Contaminants**, such as fuels and other chemicals, enter the water system through leaky storage containers and improper disposal.

Partnering with WAC: Making Your Farm and Forest Work for Clean Water

Participation in the WAC's programs is a straightforward, yet multi-step process. As we partner for clean water, the WAC, our contracting agencies and you have specific roles and commitments to execute over the life of your plan. Most obligations involve Best Management Practices — BMPs — which are designed, funded and prescribed by the WAC to address water quality problems identified on your farm. A series of BMPs applied to a single farm is called a Whole Farm Plan (WFP). A Forest Management Plan is comprised of a series of stewardship recommendations, the implementation of which employs forestry Best Management Practices.

Here you will find an overview of the steps that you and WAC will take together to implement a farm or forest plan. Some phases may take a week or two; others may require a longer commitment. Together, through the planning process, we will establish a lasting partnership that improves your farm, your forest and drinking water for nine-million New York City and Westchester County residents.

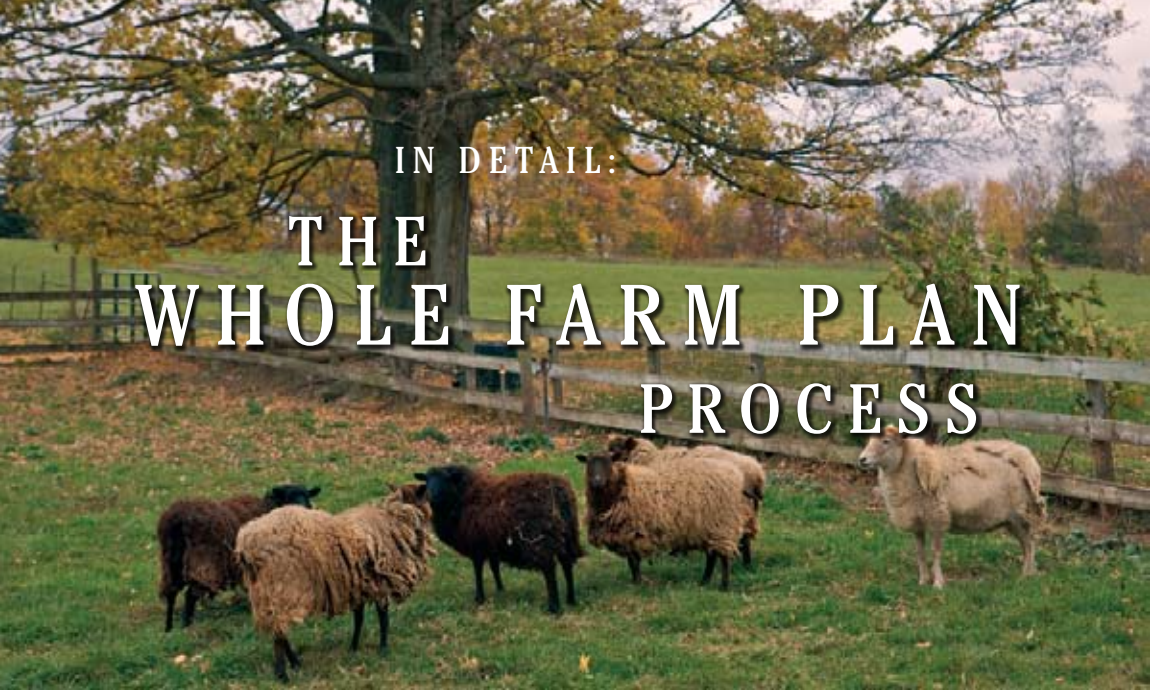
Development and implementation of a Whole Farm Plan or Forest Management Plan incorporates six phases as outlined on



the next page. From start to finish, this process may take two months to two years to complete. The East of Hudson Program develops six new Whole Farm Plans per year. Farms and BMPs may be prioritized according to their impact on water quality. Farms located in the following reservoir basins are considered “high-priority”: Cross River Reservoir, Croton Falls Reservoir, Titicus Reservoir, Muscoot Reservoir, West Branch, Boyd’s Corner, Kensico and the New Croton Reservoir. Implementation timeframes are otherwise subject to variables that are detailed opposite.

In Brief: The Whole Farm and Forest Management Plan Processes

	Watershed Agricultural Council		Landowner
	Whole Farm Plan (WFP)	Forest Management Plan (FMP)	Forest Owner
Planning	Consults with farm owner Prepares WFP	Facilitates plan creation between landowner and watershed-qualified forester	Hires watershed-qualified forester Submits application to WAC for approval
Approval	Approves WFP	Approves FMP	Reviews and approves FMP
Design	Devises practices and designs for implementation	Not applicable	Not applicable
Implementation	Estimates costs, reviews bid packages, approves method of procurement, approves choice of contract, oversees construction	Advises implementation after plan completion	Hires contractor according to relevant bid process Approves the completed practices prior to payment of contractor
Payment	Pays contractor on behalf of landowner	Disperses funds to forester on behalf of landowner	Approves/signs FMP for payment to forester
Operation & Maintenance	Provides BMP operation and main- tenance training, repairs BMP in case of malfunction Conducts annual review of WFP	Upgrades, updates and assists with FMP implementation	Maintains and operates BMPs properly for the duration of the pre-established lifespan Solicits plan upgrades as FMP necessitates



IN DETAIL:

THE WHOLE FARM PLAN PROCESS

Phase I: Planning

Timeframe: 1 month

You, the landowner, complete a short questionnaire designed to collect information about your farm and your farm practices.

A WAC planner visits with you to walk your property and complete a series of worksheets used to assess your farm's current water quality impact and identify potential concerns. These worksheet results are tallied for a total Agricultural Environmental Management (AEM) score that informs the implementation priority we will place on your farm. This AEM score also dictates the types of practices we will recommend for your WFP and the amount of WAC funding we can solicit for your plan. Additionally, the reservoir basin in which your farm is located will also influence your farm's implementation priority, as certain basins are more sensitive to pollutants than others.

A WAC planner compiles the results of the questionnaire, worksheets and landowner conversations to devise a series of Best Management Practices (BMPs) and man-



agement recommendations to address the water quality concerns. This Whole Farm Plan should be in harmony with your farm business; the BMP implementation, while highly recommended by the WAC, is at your discretion.

A WFP cost guideline is also outlined. Farm operations with the higher potential risk to water quality will have a higher cost guideline, thus program funding is directly linked with environmental risk. Planned BMP costs in excess of the established cost guideline will require a minimum of a 50% cost-sharing match from the landowner or other funding source.

A planning cost estimate — based on local rates for services, equipment and materials — is then prepared for each BMP by WAC planners.

Phase II: Approval

Timeframe: 2–4 months

The planning team finalizes the WFP's recommendations. Upon consensus, the WAC planner presents the plan to you.

With your WAC planner, you review and approve the WFP as it relates to your needs and expectations. You also confirm and approve the location and nature of the proposed construction.

Your WFP is then approved by the Program Coordinator or the EoH Committee, depending on the amount of funding requested in relation to your cost guideline.

Phase III: Design

Timeframe: 2–6 months

BMPs are designed by WAC staff in order of pollutant priority or in the order listed on your WFP. Designs are completed in accordance with USDA Natural Resource Conservation Service (NRCS) standards. These standards are nationally tested and scientifically accepted and ensure a level of quality and effectiveness is achieved when treating agricultural water quality concerns. Nonstructural practices, such as pasture and nutrient management plans, are also developed to address the farm's water quality problems that can only be improved by modifying the existing land-management techniques.

WAC engineers will visit the farm to conduct a site-specific survey prior to beginning BMP designs. They will also determine

if you need to obtain local, state or federal permits prior to implementation. A WAC planner or engineer visits with you to review and approve the drawings, designs, project layout and cost estimate prior to bid solicitation.

Subsequent to design cost estimation and WFP-2 signing, WAC will assist you in the construction bidding process known as BMP Procurement Procedures. These can be found online at www.nycwatershed.org. The procurement method used is based on the amount of the design cost estimate for the practice. Multiple installations of the same BMP on a given farm may be bid together; functionally tied practices are also often bid together. The three types of procurement methods are (1) Simple Purchase, (2) Written Quotes and (3) Sealed Bids.

Simple Purchase: This bid approach is only used for BMPs whose design cost estimate is less than \$15,000. With WAC's guidance, you are responsible for obtaining a minimum of one quote that is within the limits of the design estimates. If qualified, you may also do this work yourself.

Written Quotes: This procurement approach is used when design estimates are between \$15,000 and \$30,000. WAC's contracting officer and implementation staff, on behalf of the landowners, mail a minimum of four bid packages to contractors of the landowner's choice. Upon the quote deadline, the contracting officer records all quotes and determines the lowest, most responsible quote among those submitted.

Sealed Bids: This procurement approach is used when the design cost estimate is \$30,000 or greater. The WAC's contracting officer and implementation staff prepares an invitation for bids, which is advertised in local newspapers. Bid invitation letters are also mailed to prospective contractors on WAC's contractor registry. A site showing is scheduled at the location, date, and time specified in the

invitation for bids. You may be present at this showing. On the bid deadline date, the contracting officer determines the lowest cost, yet most responsible bidder.

Phase IV: Implementation **Timeframe: project dependent**

Following contractor selection, the WAC's procurement officer draws up a project contract. Both the builder and landowner sign the contract and agree on construction dates.

The BMP construction, or implementation, begins. Timing and completion of BMPs in your WFP depend on several factors: a BMP's pollutant category, threat level to water quality, permitting agency timeframes (if applicable), landowner and farm business schedules, the season and weather, WAC funding availability, design complexity, unforeseen factors inherent to earth-moving and construction, etc. WAC provides construc-



tion oversight during implementation, though you are ultimately in charge of the construction project. If you have problems or concerns during any part of the process, you should speak with your WAC planner, project inspector or engineer immediately.

Phase V: Payment Timeframe: Upon approval and signatures

The New York City Department of Environmental Protection provides funding to the WAC for its respective programs. The WAC manages these funds and pays a contractor for BMP implementation on your behalf. As mentioned, costs in excess of the established cost guideline will require a minimum of a 50% cost-sharing match from you or another source. The potential for a 50% cost-share will be agreed upon before construction is allowed to proceed. Several federal, state, and local sources of funding, like the USDA Forest Service, supplement the work conducted by the WAC. Federal sources consist of the Conservation Reserve Program (CRP), Environmental Quality Incentive Program (EQIP), and the Wetlands Reserve Program (WRP). For more information on these programs and how you might qualify, talk with your WAC planner. You may also identify local or private funding sources for cost-sharing on your own.

Phase VI: BMP Operation & Maintenance (O&M)

Timeframe: 10–15 years

You will receive and acknowledge a BMP operations and maintenance requirement(s) which you are obligated to comply with for the lifespan of the BMP. In the event you sell or lease land upon which BMPs have been established, we will endeavor to maintain a cooperative relationship with the new landowner or lessee. Signatory landowners who neglect to properly maintain their BMPs for the full lifespan may be responsible for full or partial reimbursement to the Watershed Agricultural Council for the cost of those BMPs.



The WAC will conduct annual evaluations of BMP functionality and effectiveness, called **Annual Status Reviews**. A review includes a WFP follow-up, BMP inspections and scheduling of outstanding BMPs. It also measures participation effectiveness, landowner satisfaction and the participant's ability to meet O&M requirements for each installed BMP.

WFP revisions occur when the farm's water quality issues are not sufficiently addressed by the existing WFP. These shortcomings may be due to changes in the farm business, the physical nature of the farm, or a failure of an existing BMP to adequately address an original issue. The revision process is similar to that of the original WFP approval and implementation.

You will also be invited to attend **training opportunities** such as WAC-sponsored workshops on how to maintain and enhance specific BMPs and increase your farm's overall viability.

BEST MANAGEMENT PRACTICES:

Some Examples and Their Effects
on Water Quality

To mitigate the passage of certain pathogens into the reservoirs, select animal waste management practices are set in place. Many of these techniques also stifle the flow of nutrients into the waterways. Here are a few examples of BMPs used to control pathogens and nutrients that may be included in your WFP.

A Waste Storage Facility is a temporary storage unit that houses waste — manure, wastewater, and contaminated runoff — as a short-term storage function component of an agricultural waste management system.





A Watering Facility is a tank, trough, or other watertight container that provides animals access to water, as an alternative to natural waterway access.



A Wastewater Treatment Strip is an area of herbaceous vegetation situated between cropland, grazing land, or disturbed land (including forestland) and a stream. The area between the environmentally sensitive area and the strip reduces sediment and the contaminants that it can carry.



A Composting Facility is a facility where raw manure or other organic by-products naturally decompose into biologically stable organic material. A concrete, multi-bay windrow system, pictured here, reduces the pollution potential of organic agricultural wastes from entering surface and ground water.

A Nutrient Management

Plan is a written document that identifies and manages the amount, source, placement, form, and timing of the application of plant nutrients and soil amendments. This prescription maintains or improves the physical, chemical, and biological condition of the soil.



A well executed Nutrient Management Plan minimizes agricultural runoff from polluting surface and ground water.

BMPs can also protect against pesticides. Although individual pesticide concentrations in Croton streams have not reached levels of concern to human health, their effects on other stream inhabitants — such as fish, plants, and insects — are of great concern. A BMP example to control pesticide use is Integrated Pest Management (IPM). IPM utilizes environmentally sensitive prevention, avoidance, monitoring and suppression strategies to manage weeds, insects, disease, animals, and other organisms, that directly or indirectly cause damage to the farm's product or operation. IPM enhances the quality and quantity of crops and other farm products, while minimizing the negative impacts of pest management on soil, water, air, plants, animals, and humans.



Sedimentation, causing turbidity and depleting dissolved oxygen levels, can be mitigated using a variety of simple, low-impact solutions. Decreasing sediment migration to surface water also results in a decrease in other pollutants that attach to soil particles, such as nutrients and pesticides. Here are a few examples of BMP sediment controls.



Riparian Buffers are areas of trees and/or shrubs located adjacent to, and upslope from, water bodies to reduce excess sediment, organic material, nutrients, and pesticides in surface runoff and shallow ground water.

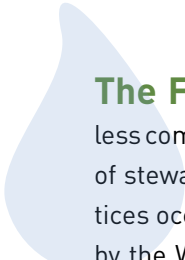
Cover Crops involve the planting of grasses, legumes, forbs, or other herbaceous plants to establish seasonal ground cover. These and other conservation purposes reduce soil erosion from wind and water and prevent sediment from entering water courses.



An Open-Top Culvert is a water management structure that conveys water and controls the direction or rate of flow to control the discharge, distribution, delivery, or direction of water flow. This ensures that potential discharges to surface and ground water resources are controlled, filtered or eliminated.



THE FOREST MANAGEMENT PLAN & OTHER FORESTRY PROGRAM OFFERINGS



The Forest Management Plan (FMP) process is less complex than the Whole Farm Plan process. Implementation of stewardship recommendations and Best Management Practices occurs at the landowner's request once a FMP is approved by the WAC. The Watershed Forestry Program encompasses a number of initiatives beyond forest management planning to help landowners maximize the health and value of their forests. To further discuss these initiatives and how to take advantage of them, please contact the WAC East-of-Hudson Program at (914) 962-6355.

Choosing the right forester has important long-term consequences for your property. The advice a forester gives, and the advice you choose to pursue, can affect your woods for 30, 40, 50 years— or longer. New York State does not require foresters to carry a license. There are, however, other ways to evaluate a forester's professionalism and experience. For more information on finding and selecting a forester, read the brochure "Choosing a Forester" available at www.nycwatershed.org.

Landowners should consider personal recommendations, education and training, professional affiliations and certification when selecting a forester. The WAC recommends you select candidates from a list of watershed-qualified foresters, which can be found at www.nycwatershed.org/lc_foresters.html. The forester will visit your property, talk with you about your expectations and create a Forest Management Plan that reflects your goals. The WAC recommends you select candidates from a list of watershed-qualified foresters that can be found on our website.

A watershed-qualified forester then writes the Forest Management Plan. At times, a WAC forester prepares the plan for forest sites offering unique outreach opportunities. The steps for completing a Forest Management Plan are similar to those outlined in the Whole Farm Plan.

Phase I: Application

Timeframe: 1 month

You submit a completed application including the tax parcel identification number(s), owner contact information, and property address. Power of attorney can also be accepted, if necessary, for this step.

The WAC verifies that the land is located within NYC watershed boundaries and is without a current and pre-existing Forest Management Plan. A Forest Management Plan that already exists on a property, but does not adhere to WAC standards, may be upgraded with WAC funding.

Phase II: Approval

Timeframe: 1–2 months

WAC staff approves individual acreages and funding amounts. The WAC staff recommends your application and your land parcel to the Forestry Program Committee for approval. This committee meets every other month.



Phase III: Planning

Timeframe: 1–12 months

You hire a watershed-qualified forester. The watershed-qualified forester must submit a plan to the WAC within 12 months from the date of application approval.

Phase IV: Implementation

Timeframe: 6 months–2 years

A landowner can commence implementation of the Forest Management Plan at any time. You may be eligible to receive technical and cost-sharing assistance for plan implementation. Assistance through the Conservation Reserve Enhancement Program for stream buffers (CREP) and the Management Assistance Program (MAP) may also be available. Both cost-share programs are highly competitive, matching grant formats. MAP holds two funding rounds per year. For a complete overview of the WAC's Forestry Program, its offerings and standards, refer to the latest Forestry Handbook available at www.nycwatershed.org.

Phase V: Payment

Timeframe: Upon submitted invoice

A FMP that adheres to the WAC's specifications is funded accordingly:

- \$500 for plan preparation plus:

 - \$8 per acre for the first 50 acres of forestland

 - \$6 per acre for 51 to 100 acres of forestland

 - \$5 per acre for 101 acres or more of forestland

 - \$50 for any riparian planning

 - \$10 per acre under riparian management

The WAC disburses funding to the consulting forester based on a submitted invoice for the completed plan.

Phase VI: Maintenance of Your Forest Management Plan

Timeframe: Up to 10 years

Forest Management Plans are reviewed on-site with the landowner after five years.

After 10 years, FMPs are eligible for updating at full plan funding rates.



USEFUL RESOURCES

Watershed Agricultural Council
1275 Hanover Street
Yorktown Heights, NY 10598
(914) 962-6355
www.nycwatershed.org

New York City Department of
Environmental Protection
71 Smith Avenue
Kingston, NY 12401
www.nyc.gov/dep

Cornell Cooperative Extension

CCE—Dutchess County
2715 Route 44
Millbrook, NY 12545
(845) 677-8223, ext. 100
dutchess@cornell.edu

CCE—Putnam County
Terravest Corporate Park
1 Geneva Road
Brewster, NY 10509
(845) 278-6738
putnam@cornell.edu

CCE—Westchester County
26 Legion Drive
Valhalla, NY 10595
(914) 285-4640
westchester@cce.cornell.edu

Empire State Forest Products
Association: The New York
Forestry Resource Center
47 Van Alstyne Drive
Rensselaer, New York 12144
(518) 463-1297
esfpa@esfpa.org
www.esfpa.org

New York Forest Owners
Association
PO Box 541
Lima, NY 14485
(800) 836-3566 or (585) 624-3385
lgooding@nyfoa.org
www.nyfoa.org

NYS Department of
Environmental Conservation
Various Locations and Regions
www.dec.state.fed.ny.us

NYS Department of Agriculture
and Markets
10B Airline Drive
Albany, NY 12235
(800) 554-4501
www.agmkt.state.ny.us

Soil and Water Conservation District

Dutchess County
2715 Route 44 Suite 3
Millbrook, NY 12545
(845) 677-8011 ext. 3
www.dutchessswcd.org

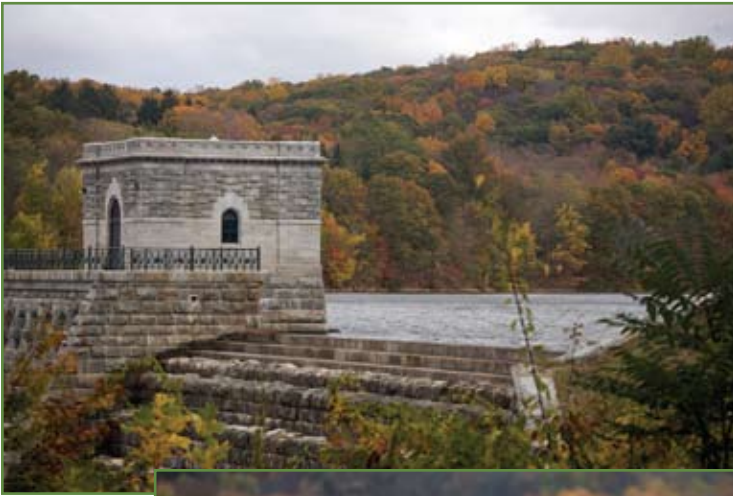
Putnam County
841 Fair Street
Carmel, NY 10512
(845) 878-7918
[www.putnamcountyny.com/
soilandwater](http://www.putnamcountyny.com/soilandwater)

Westchester County
432 Michaelian Office Bldg.
148 Martine Avenue
White Plains, NY 10601
(914) 995-4423
[www.westchestergov.com/
Planning/environmental/
SoilH20.htm](http://www.westchestergov.com/Planning/environmental/SoilH20.htm)

USDA Natural Resources
Conservation Service
Millbrook Service Center
2715 Route 44
Millbrook, NY 12545-0037
(845) 677-3952
www.nrcs.usda.gov

USDA Farm Service Agency
Millbrook Service Center
2715 Route 44
Millbrook, NY 12545-0037
(845) 677-3952
www.fas.usda.gov

US Forest Service
www.na.fs.fed.us





WAC Planner: _____

Phone: _____

WAC Engineer: _____

Phone: _____

Project Inspector: _____

Phone: _____

NRCS Contact: _____

Phone: _____

Watershed-qualified forester: _____

Phone: _____

Logger: _____

Phone: _____



Watershed Agricultural Council
www.nycwatershed.org

