New York City Filtration Avoidance Determination

USEPA - November 2002

Surface Water Treatment Rule Determination for
New York City's Catskill/Delaware Water Supply System

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The Environmental Protection Agency (EPA) has determined that New York City has an adequate long-term watershed protection program for its Catskill/Delaware water supply that meets the requirements of the Surface Water Treatment Rule (SWTR) and the Interim Enhanced Surface Water Treatment Rule (IESWTR) for unfiltered water supply systems. The comprehensive program was established through implementation of the 1997 Filtration Avoidance Determination (FAD) and the New York City Watershed Memorandum of Agreement. The City has developed partnerships with multiple stakeholders in the watershed which enable it to implement the necessary watershed protection program elements. The City's December 15, 2001, Long-Term Watershed Protection Program contains significant enhancements as well as a commitment to continue this "core" program for as long as the system remains unfiltered. Full implementation of the program (which is an attachment to this document), including implementation of the Watershed Rules and Regulations (effective May 1, 1997), the State's Land Acquisition Permit, and program modifications/additions contained in this determination, is required by this determination. This determination also requires that New York City continue to meet the filtration avoidance criteria, detailed in 40 CFR §141.71 and 40 CFR §141.171.

The 2002 FAD outlines the City's Long-Term Watershed Protection Program components as well as specific milestones and reporting requirements that must be met for continued SWTR compliance for an unfiltered water supply system. (EPA notes that the City is required to meet the milestone date or requirement in this determination in instances where it differs from that in the City's Long-Term Watershed Protection Program.) EPA, in partnership with the New York State Department of Health (NYSDOH), will conduct a comprehensive review of the City's implementation of its Long-Term Watershed Protection Program, including implementation and enforcement of the Watershed Rules and Regulations, by July 2006. This review will evaluate (1) the progress the City is making in implementing its Long-Term Watershed Protection Program and meeting the program's objectives, and (2) the City's compliance with this determination. The review will include input from the New York City Department of Environmental Protection (NYCDEP) and watershed stakeholders. It is expected that the outcome of this review will be a commitment by the City, by December 14, 2006, to additional Long-Term Watershed Protection Program milestones through 2012 as well as to program changes recommended by EPA and NYSDOH. This commitment, which will be in the form a revised Long-Term Watershed Protection Program, will be the basis of EPA's next revision to this determination, scheduled for April 2007.

This 2002 FAD supersedes the May, 1997 FAD and will be applicable until a further determination is made. At any time, EPA or the primacy agency may make a determination that the City's watershed program no longer provides adequate protection of the City's water supply, pursuant to the SWTR/IESWTR and/or other avoidance criteria in the SWTR/IESWTR and require the City to filter its Catskill/Delaware water supply.

1. Background and Basis for Determination

Regulatory Background

As required under the Safe Drinking Water Act (SDWA) Amendments of 1986, EPA promulgated the SWTR on June 29, 1989, specifying the criteria under which filtration is required as a treatment technique for public water systems supplied by a surface water source. The SWTR is codified in Subpart H of 40 CFR, Part 141 - National Primary Drinking Water Regulations. The SWTR was promulgated to reduce the risk of water borne disease outbreaks from microbial contaminants at public water systems with surface water sources, either through filtration or by meeting the stringent water quality, disinfection and site-specific avoidance criteria which make filtration unnecessary.

In response to requirements in the 1996 Amendments to the SDWA, EPA amended the SWTR on December 16, 1998, with the Interim Enhanced Surface Water Treatment Rule (IESWTR) which is codified in Subpart P of 40 CFR, Part 141. The IESWTR required unfiltered systems to meet several new provisions to remain unfiltered, including compliance with new and more stringent disinfection byproduct maximum contaminant levels and the requirement to address *Cryptosporidium* in their watershed control programs. In addition, unfiltered systems must continue to meet all of the existing filtration avoidance criteria established in the SWTR (40 CFR §141.71) and the IESWTR (40 CFR §141.171) and outlined below.

Source water quality conditions:

§141.71 (a)(1): Fecal coliform concentration requirements

§141.71 (a)(2): Turbidity level requirements

Site-specific conditions:

§141.71 (b)(1)(i)/§141.72(a)(1): Disinfection, CT requirements

§141.71 (b)(1)(ii)/§141.72(a)(2): Redundant disinfection and auxiliary power

§141.71 (b)(1)(iii)/141.72(a)(3): Entry point disinfectant residual requirements

§141.71 (b)(1)(iv)/§141.72(a)(4): Disinfectant residual in distribution system

§141.71(b)(2): Watershed control program

(i) Characterize watershed hydrology and land ownership;
(ii) Identify watershed characteristics and activities which may have an adverse effect on source water quality; and
(iii) Monitor the occurrence of activities which may have an adverse

effect on source water quality.

§141.71 (b)(3) and §141.171(b): Annual on-site inspection

§141.71 (b)(4): System is not a source of a waterborne disease outbreak

§141.71 (b)(5): System meets coliform maximum contaminant level eleven months of the year

§141.71 (b)(6): System complies with disinfection byproduct requirements.

§141.171(a): Minimize the potential for contamination by *Cryptosporidium* oocysts in the source water.

If, at any time, a system fails to meet the avoidance criteria, it may be required to provide filtration within 18 months of such failure.

Federal and State Roles in Determining Whether Filtration is Required

In New York State, EPA delegated primary enforcement responsibility (primacy) of the SDWA to the NYSDOH on September 9, 1977. Under this delegation, NYSDOH has primacy for implementation and enforcement of the drinking water regulations. EPA is responsible for overseeing NYSDOH's implementation and enforcement of the drinking water program. However, when EPA promulgates a new rule, such as the SWTR, EPA retains primary enforcement responsibility for the new rule until it has approved a State's primacy package. On July 30, 1993, EPA announced its determination that it approved NYSDOH's primacy package and intended to delegate primacy of the SWTR to NYSDOH. A public hearing on that determination was requested and a hearing was held on December 7, 1993. EPA received public comments at the hearing and thereafter. Based on those comments, the primacy revision package, and other applicable information, EPA delegated primacy to NYSDOH for the SWTR for all public water systems in New York State, except New York City's Catskill/Delaware public water system. Primacy for the SWTR for the Catskill/ Delaware system is scheduled to be delegated to NYSDOH on May 15, 2007. NYSDOH has not yet applied for primacy for the IESWTR. EPA's FAD does not contain or imply any determination with respect to NYSDOH's Public Water Supply Supervision program or primacy.

Previous Filtration Avoidance Determinations

EPA's First Determination (January 1993): Following NYCDEP's July 1992 submission of an application not to filter its Catskill/Delaware water system, EPA began an in-depth review of New York City's water supply in order to determine whether the Catskill/Delaware system could fully meet the avoidance criteria. EPA concluded that the system met each of the objective criteria for filtration avoidance. EPA also concluded that the City's existing watershed

protection programs were adequate and met the SWTR goal for a watershed control program, but that the program's ability to meet the criteria in the future was uncertain. Accordingly, on January 19, 1993, EPA issued its conditional determination granting filtration avoidance until a further determination was made, on or before December 31, 1993, or earlier if the City failed to meet the conditions for avoidance.

EPA's Second Determination (December 1993): In September 1993, NYCDEP submitted "New York City's 1993 Long-Term Watershed Protection and Filtration Avoidance Program" to demonstrate that the Catskill/Delaware system could and would continue to meet the filtration avoidance criteria in the future. EPA reviewed historic and 1993 water quality data, "New York City's 1993 Long-Term Watershed Protection and Filtration Avoidance Program," the City's achievements meeting the conditions contained in EPA's January 19, 1993 conditional determination, the EPA March 23, 1993 Expert Panel Report, public comments received, and additional documentation submitted by the NYCDEP and interested parties on the watershed. EPA concluded that the Catskill/Delaware system met each of the SWTR objective criteria for filtration avoidance. EPA also concluded that NYCDEP's existing watershed protection programs continued to be adequate and met the SWTR's criteria for a watershed control program, but that the program's ability to meet the criteria in the future was still uncertain. EPA determined that progress was made toward enhanced watershed protection programs. However, EPA sought a more refined characterization of the watershed and more specific data concerning the identification and location of the activities within the watershed. EPA also wanted the watershed protection programs to operate for a longer time period in order to evaluate the effectiveness of the programs' long-term abilities to monitor and control activities which have the potential to pollute the water supply.

On December 30, 1993, EPA issued a second conditional determination which allowed New York City's Catskill/Delaware public water system to remain unfiltered. This second determination was intended to be effective until a further determination was made, scheduled for December 15, 1996, and contained conditions primarily related to enhanced watershed protection and monitoring programs, pathogen studies, reservoir modeling and other efforts to characterize the watershed and human activities. The conditions also included continued design of filtration facilities should EPA deem filtration necessary in the future, as well as a requirement that the City cover and remove bottom sediment from Hillview Reservoir. Hillview Reservoir was thought to be the cause of violations of the Total Coliform Rule in 1993 and, again, in 1994. (Hillview remediation requirements are now part of a NYCDEP/NYSDOH Administrative Order on Consent and are, therefore, no longer FAD requirements. Sediment has been removed from the reservoir and cover installation is scheduled to begin by April 30, 2002.)

EPA's Third and Fourth Determinations (January and May 1997): By 1995, implementation of a number of conditions of the 1993 determination had not yet occurred. At that time, EPA and other interested stakeholders urged the Governor of New York State to intercede. Governor Pataki brought the parties together in a consensus-building approach to negotiate reasonable, effective and scientifically-defensible watershed protection programs. The January 1997 New York City Memorandum of Agreement (MOA), signed by New York State, New York City, watershed towns and counties, environmental parties and EPA, enabled NYCDEP to implement

watershed protection programs necessary to continue to avoid filtration. On January 21, 1997, NYCDEP received a water supply permit from the New York State Department of Environmental Conservation (NYSDEC), which authorized NYCDEP to acquire land and conservation easements in the watershed of the New York City water supply system. The City promulgated new Watershed Rules and Regulations and established economic partnerships with watershed communities to assist the City and stakeholders in their efforts to protect the watershed. In addition, the MOA mandated wastewater treatment plant upgrades, non-point source pollution controls, and the review of the existing monitoring program.

EPA issued a four-month interim FAD on January 21, 1997, followed by a FAD in May 1997, granting New York City conditional relief from filtering its Catskill/Delaware water system until the agency made a further determination, scheduled for April 15, 2002.

EPA's November 2002 Filtration Avoidance Determination

In May 2000, EPA conducted a mid-course review of the 1997 Filtration Avoidance Determination. That review concluded that while New York City had made significant progress in many of its watershed protection programs, there were a number of corrective actions for specific FAD tasks as well as program enhancements that needed to be implemented to ensure the long-term viability of filtration avoidance. EPA's review identified two critical areas where the City was required to significantly better its efforts: (1) acquiring land or conservation easements around the Kensico Reservoir, where nearly all of the water from the Catskill/Delaware system flows before it enters the distribution system, and (2) upgrading the treatment technology at the 34 non-City-owned sewage treatment plants that account for 60% of the sewage discharged in the Catskill/Delaware watershed. The FAD Mid-Course Review also made a number of recommendations that had to be substantially addressed prior to EPA's scheduled 2002 determination.

Since May 2000, NYCDEP has acquired, or obtained conservation easements on, over 150 acres of land in Kensico basin and is continuing to focus substantial efforts on future acquisitions. In addition, the City has significantly sped up the pace of its wastewater treatment plant upgrade program. A total of six facilities (including four of the largest dischargers), which account for over 80% of the flow from non-City-owned plants, were upgraded and began operation in August 2002. The remaining plants will be upgraded on a staggered schedule, through 2004. Although this schedule is behind the May 2002 completion date specified in EPA's 1997 FAD, the City has moved this program forward expeditiously since EPA's FAD Mid-Course Review.

The 1997 FAD required that NYCDEP, in addition to implementing a watershed protection program, continue the design of the Catskill/Delaware system filtration plant so that no time would be lost if filtration is later determined by EPA to be necessary. However, the FAD also allowed the City relief from initiating final design work if it is in substantial compliance with the FAD, and if it is providing adequate protection of its Catskill/Delaware watershed so as to render unnecessary the initiation of the final design. The City requested this relief in December 2000. With the completion of the preliminary design on September 30, 2001, and in view of progress

made in addressing concerns raised by EPA in its FAD Mid-Course Review, EPA granted the City conditional relief from final design requirements for the Catskill/Delaware filtration plant on November 29, 2001. As a condition of relief, the City is required to (1) complete the upgrade of the largest wastewater treatment plants by June 2002, (2) conduct a feasibility study and then design and construct ultraviolet (UV) disinfection facilities for the Catskill/Delaware system, in accordance with an EPA-approved schedule, (3) institute a biennial review of the Catskill/Delaware filtration plant preliminary design, and (4) conduct other watershed planning activities.

In mid-2001, EPA began substantive discussions with NYCDEP and New York State, and instituted an outreach program with other watershed stakeholders, in preparation for the City's December 2001 submittal of a new Long-Term Watershed Protection Program. EPA's objective in these efforts was to ensure that the revised program would adequately address the recommendations EPA made in its FAD Mid-Course Review and that the program would address many of the issues raised by watershed stakeholders. The major recommendations made by stakeholders (many of which were also included in EPA's recommendations) included:

- Enhance implementation/enforcement of the Watershed Rules and Regulations, particularly with respect to stormwater runoff pollution;
- Continue watershed protection partnership programs (e.g, septic, community infrastructure, and stream management);
- Increase involvement by locally-based organizations (counties, not-for-profit organizations, Soil and Water Conservation Districts, etc.) to implement watershed protection programs;
- More effectively use and integrate the City's authority under SEQRA and the Watershed Rules and Regulations to address activities that may adversely impact water quality – particularly in high growth areas east-of-Hudson;
- Increase efforts to remediate/address turbidity problems in the Schoharie basin;
- Increase protection of the Kensico basin, other Catskill/Delaware basins east-of-Hudson, and Croton basins that may, on an emergency basis, supplement water in the Delaware Aqueduct; and
- Enhance data dissemination and reporting.

On December 15, 2001, NYCDEP submitted to EPA its Long-Term Watershed Protection Program. In its 2001 program, the City commits to build substantially on the program set forth in the 1997 FAD. In addition, the City emphasizes watershed protection as a long-term commitment. It points out that "as long as the Catskill/Delaware system remains unfiltered, these core programs will remain in place." EPA views this long-term commitment by the City an integral element of an adequate watershed control program, pursuant to the SWTR/IESWTR, and it is a very positive step toward long-term filtration avoidance.

With the City's commitment to a long-term program, EPA believes an important and appropriate adjustment has been made - - that it is the City's program and long-term vision and strategy for watershed protection that drives EPA's filtration determination. In the past, the City has been

hesitant to commit to a full-scale, continuation of its watershed protection programs until EPA had given it the "green light" with its determination. With a long-term commitment to core watershed protection program elements, the City will be able put more resources into the long-term planning and evaluation of its watershed protection efforts which, in turn, will lead to a better watershed protection program. In addition, the City's implementation partners will have more assurance that core programs will continue beyond the milestone dates contained in the current determination. This allows these partners to continue to build in-house expertise and to work with the City on long-term watershed protection planning.

The City's Long-Term Watershed Protection Program also reflects a very positive change that has taken place over the last several years - - the increased cooperation between the City and watershed partners in implementing watershed protection programs. The City's willingness to shift administration of a number of programs to locally-based organizations is a major demonstration of the progress made to date. In the City's Long-Term Watershed Protection Program, it states that "initially, the City was reluctant to cede responsibility for program implementation to others." However, experience has demonstrated that organizations such as the Catskill Watershed Corporation and the Watershed Agricultural Council, and municipalities have been able to implement complicated watershed protection programs quickly and effectively. In the City's Long-Term Watershed Protection Program, the City states:

> All of these activities mean local expertise is being developed throughout the watershed to insure that future land management activities are conducted in the best way possible to protect and improve water quality. While the activity and record of accomplishment is very significant, it is the local expertise, economic value of these programs, and understanding of the local benefits that will serve the New York City water supply well into the future.

The City goes on to state that "support from and cooperation with [its] watershed partners is key to the successful implementation of the City's program." EPA endorses the City's commitment to continue this working partnership. While EPA's filtration determination is directed at the City, and it is the City that is ultimately responsible for implementing an effective watershed control program, the agency strongly agrees that a good upstate/downstate relationship is fundamental to an effective program in the long-term.

In an additional example of upstate watershed stewardship, Delaware County has developed a comprehensive program to reduce phosphorus loading to the Cannonsville Reservoir basin. Under their Delaware County Action Plan (DCAP), an inventory of sources of phosphorus was conducted, an assessment of phosphorus loading and potential reduction targets was calculated, and phosphorus reduction demonstration projects are being implemented. DCAP is a voluntary initiative to improve water quality in the Cannonsville reservoir and to improve opportunity for local economic vitality.

Another avenue for enhanced upstate/downstate relationships is the Watershed Protection and Partnership Council established under the MOA which is composed of 27 watershed stakeholders. EPA notes that as the FAD process goes forward, the Council is also undergoing a

review process of a number of watershed protection plans and programs under the MOA. This process commenced in early 2002 with the submission of written reports from the City and State evaluating their respective activities to implement the MOA. The Executive Committee of the Council has concluded its 5-year review of the MOA. It made a number of program recommendations, many of which are included in this FAD, but determined that no changes to the MOA are necessary at this time.

The City's 2001 Long-Term Watershed Protection Program continues most of the existing program components, provides significant enhancements to many of them, and includes a number of new program initiatives. Some program elements are highlighted below:

Watershed Rules and Regulations

NYCDEP will enhance its participation in reviewing projects under the State Environmental Quality Review Act (SEQRA) by actively participating at the earliest possible time in the SEQRA planning process, identifying broader water quality concerns raised by such projects, and encouraging consideration of alternatives. NYCDEP will also encourage applicants to analyze measures for appropriately managing stormwater from the proposed project site and to minimize impervious surfaces during SEQRA review. To that end, NYCDEP will develop internal guidance for project review staff and ensure staff are trained to implement the program. NYCDEP will also review and make appropriate changes to Stormwater Pollution Prevention Plan (SPPP) guidance to (1) reflect best management practices (BMP) field monitoring data, (2) refine BMP assumptions, (3) create performance-based benchmarks, (4) highlight the importance of non-structural BMPs and buffers, and (5) promote innovative site design to meet SPPP requirements.

Also with regard to stormwater, NYCDEP, NYSDEC, and the State Attorney General's office have begun an initiative to coordinate stormwater enforcement efforts to ensure compliance with regulatory requirements and to ensure prompt detection and remediation of water quality violations. NYCDEP and NYSDEC will amend their memorandum of understanding (MOU) to include a stormwater enforcement addendum detailing coordination objectives, points of contact, roles and responsibilities, and stormwater information needs. The wastewater treatment plant enforcement program has resulted in a reduction from 20% to 5% significant noncompliance as well as significant reductions in total phosphorus loads in the watershed. (All significant noncompliance has been addressed through timely and appropriate enforcement actions.) EPA expects that this stormwater enforcement program will provide substantial environmental benefits as well. EPA looks to the City, working with the State, to provide strong support in this effort.

The City will increase education and outreach activities as they relate to the Watershed Rules and Regulations. This will be accomplished by conducting

workshops on the regulations and on NYCDEP's role in SEQRA that will be tailored for design professionals, planning boards, building inspectors and other municipal staff. NYCDEP will provide additional training for police and protection staff to identify and report violations of the Watershed Rules and Regulations and water quality violations. In addition, NYCDEP will work with the New York State Department of Transportation, in consultation with NYSDEC, on a pilot program that encourages the efficient use of appropriate winter highway de-icing materials in the watershed.

In June 2002, the City banned the use of new galleys for wastewater treatment within the watershed through an amendment to its Watershed Rules and Regulations. NYSDOH is currently working on an identical amendment to its regulations.

Land Acquisition

The City will: (1) continue to solicit land in accordance with the FAD and MOA schedule through the next 5 years, (2) implement a resolicitation strategy, (3) work to reduce the time interval between contract and closing, and (4) continue its best efforts to acquire land in the critical Kensico basin. During the next 5 years, EPA and NYSDOH will periodically evaluate whether the City needs to add $50 million to the program. In addition, the City will request renewal of its water supply permit for an additional 5 years (through 2012).

Kensico Basin

NYCDEP continues to build on its comprehensive program to protect and improve water quality in the Kensico basin. Besides continuing its efforts to buy land in the basin, the City will complete basin-wide stormwater infrastructure mapping to support maintenance or repair actions for existing BMPs and to evaluate the need for additional stormwater control requirements. It will implement an enhanced spill containment program along Rte.120, 22 and Nanny Hagen Road, expand membership of Kensico Watershed Improvement Committee to other corporate/commercial facilities (and involve other interested watershed stakeholders in the planning and implementation process), and work with Westchester County and local municipalities to implement inspection and maintenance protocol for county sewers. The City will provide a periodic, integrated Kensico Basin Report in which it will report on the status of all its protection/remediation efforts as well as present and discuss monitoring data and ongoing research.

Septic System Program

The City's Long-Term Watershed Protection Program builds on the existing program to address failing septic systems in the watershed through the

continuation of the Catskill Watershed Corporation's (CWC) Septic Rehabilitation and Replacement Program and the City's Sewer Extension Program. In addition, the City has committed to a number of substantial program enhancements. The City will: (1) provide additional funding for the New Infrastructure Program to address MOA communities # 6 and 7, (2) fund a new Community Wastewater Management Program to provide wastewater solutions to address five additional communities on the MOA list, and (3) fund a new Septic Maintenance Program, to be implemented by CWC, that will support the proper operation and maintenance of septic systems west-of-Hudson.

The City will also conduct house-to-house surveys in the West Branch and Boyd's Corner basins, east-of-Hudson, and begin to address any failing systems in those basins as well. The City will address potentially failing septics in the Cross River and Croton Falls basins, as well as septics in the entire Croton watershed, through implementation of its East-of-Hudson Non-Point Source Management Plan. A milestone schedule for the East-of-Hudson Non-Point Source Management Plan is included in this determination.

Wastewater Treatment Plant (WWTP) Upgrades

The WWTP Upgrade Program constitutes: (1) the installation of advanced tertiary treatment (microfiltration or approved equivalent) and phosphorus removal at all surface water discharging WWTPs, (2) the decommissioning and connection of certain existing WWTPs to existing or new sewage treatment facilities, and (3) the installation of phosphorus removal and disinfection, where applicable, at all subsurface discharging WWTPs within the New York City watershed. The City has completed the upgrade of WWTPs that account for approximately 83% of the flow from non-City-owned plants in the Catskill/Delaware. This was a condition of relief from the FAD requirement to complete final design of Catskill/Delaware filtration plant facilities. The rest of the plants will be upgraded on a staggered schedule through 2004. Interim enhanced treatment (UV disinfection) will be installed by September 2003 at a few WWTPs that will connect to new sewage treatment facilities in lieu of upgrades. The new facilities will come on line in 2004, 2005 and 2006. The City's Long-Term Watershed Protection Program also includes a schedule for the upgrade of newly identified subsurface (ten) and surface-discharging (one) WWTPs.

Stream Management Program

The Stream Management Program is intended to address areas of stream system degradation that has contributed to streambank and bed erosion, and the loss of riparian buffers (all of which contribute to increased turbidity). An overarching goal of the program is to restore stream stability by providing for the long-term stewardship of streams and floodplains. In 1994, the City developed a Stream

Corridor Protection Plan which is the basis for the existing Stream Management Program. A prioritization strategy and implementation schedule for the Stream Management Program was submitted in 1998. New York City's 2001 Long-Term Watershed Protection Program significantly scales up the City's commitment to this program through the implementation of more stream restoration projects and the completion a number of stream management plans. The stream management plans, in turn, lay the groundwork for future stream protection efforts. Upon completion of Stream Management Plans, NYCDEP will identify which riparian areas, if any, covered by such Plans are critical to the protection of water quality, and to provide funding and/or other resources to ensure their long-term protection. The City will also conduct a quantitative assessment of its overall efforts to protect riparian buffer areas and develop recommendations and a plan for any needed enhancements or additions to ongoing riparian buffer protection initiatives.

The City will coordinate the implementation of the Stream Management Program with local Soil and Water Conservation Districts, county planning agencies and other watershed partners which will implement various aspects of this program. In order to assess the overall success of this program, NYCDEP will develop (with the help of an advisory board) and implement a program evaluation strategy.

Agricultural Program

The 1997 FAD required the continued implementation of a Watershed Agricultural Program (WAP) coupled with an evaluation of the program every two years. The overall objective of the program is to prevent pollution and improve water quality by reducing pollutants leaving the farm through the implementation of best management practices. The WAP is designed to meet these objectives through the development and implementation of Whole Farm Plans. The program, which is being administered by the farmer-led Watershed Agricultural Council, has met its overall goal of 85% participation, along with its annual implementation goals. The City's 2001 Long-Term Watershed Protection Program expands the program's reach both to small farms (less than $10,000 annual farm income) and to eligible farms in Catskill/Delaware basins east-of-Hudson as well as the Croton watershed.

Watershed Forestry Program

The Watershed Forestry Program, administered by the Watershed Agricultural Council, is a voluntary partnership between New York City and the forestry community to support and maintain well-managed forests in the watershed. The primary objective of the program is to maintain unfragmented forested land and promote the use of management practices to prevent non-point source pollution during timber harvests. The Forestry Program, which began as a grass-roots

effort, was incorporated into NYCDEP's Non-point Source Pollution Control Strategy in the 1997 FAD. The program provides resources for logger training, forest management planning, implementation of management practices, research, demonstration projects and educational opportunities. The City will continue to provide resources to this program such that program objectives will continue to be achieved, and it will extend the program to Catskill/Delaware basins east-of-Hudson as well as the Croton watershed.

Non-Point Source Programs - East of Hudson (EOH)

NYCDEP has committed to a significant expansion of its watershed protection efforts in the Catskill/Delaware basins east-of-Hudson (West Branch and Boyd's Corner) as well as in the Croton Falls and Cross River basins. (Water from Croton Falls Reservoir and Cross River Reservoir may be pumped into the Delaware aqueduct on an emergency basis, with EPA and NYSDOH approval). The City will begin implementation of the following program elements in these basins: agricultural program, forestry program, and new septic and stormwater initiatives. The City will also work with the U.S. Department of Agriculture to implement the Conservation Reserve Enhancement Program (CREP) east-of-Hudson. In addition, the City will complete and implement a Croton Watershed Strategy that will provide for integrated watershed management to protect and improve water quality in the Croton system. NYCDEP will also address many concerns in the east-of-Hudson watershed through aggressive implementation of the Watershed Rules and Regulations, increased involvement in project reviews, and a detailed analysis of impervious surfaces at the sub-basin scale. As the Westchester and Putnam County Croton Plans are completed, it is expected that the counties, too, will play an increased role in addressing non-point sources in the east-of-Hudson basins. The City will work closely with Westchester County, Putnam County and the watershed communities, to coordinate, to the extent practicable, planning and implementation of actions under the City's East-of-Hudson Non-point Source Management Plan and the Counties' Croton Plans.

Catskill Turbidity

The Catskill system is prone to elevated turbidity levels due to the underlying geology. Periodically, storm events cause NYCDEP to utilize chemical treatment (alum) to control high turbidity levels in order to meet the SWTR turbidity standard at the Kensico Reservoir. EPA does not view the use of chemicals in Kensico as a long-term solution to the problem and does not view it as an appropriate method to meet the SWTR turbidity requirements for an unfiltered system. Therefore, the City has committed to a three-pronged program to more effectively address turbidity problems in the Catskill system: (1) a comprehensive analysis of engineering/structural alternatives to reduce turbidity levels leaving the Schoharie Reservoir, with a commitment to implement a cost-effective solution, (2) the development, with NYSDEC, of a release management strategy

to help meet water quality and water quantity objectives, and (3) a comprehensive look at the potential sources of turbidity in the Schoharie basin, an analysis of their relative impacts on water quality, and a detailed plan to address them (with milestones), if they are not already specifically slated to be addressed through other protection programs. As early action measures, NYCDEP will dredge the Schoharie Reservoir intake channel, and, if feasible and cost effective, implement a turbidity curtain at the Schoharie Reservoir intake. NYCDEP will also increase the number of stream restoration projects slated for the Schoharie basin, beyond those specifically targeted in the 2001 Long-Term Watershed Protection Program.

Wetlands Protection Program

The City has modified its existing Wetlands Protection Program through its 2001 Long-Term Watershed Protection Program's Wetlands Protection Strategy. It includes an enhanced regulatory review and enforcement program with NYSDEC, and an expansion of the City's wetlands functional assessment program to the entire Catskill, Delaware and Croton watersheds, in conjunction with the U.S. Fish and Wildlife Service. In addition, the City will continue and expand its wetlands trend analysis in the watershed and upgrade its wetlands tracking database. The City will also increase its internal coordination, particularly among the land acquisition program and the stream management program, to ensure that it utilizes all available tools to protect wetlands in the watershed.

Waterfowl Management Program

The objective of the Waterfowl Management Program is to minimize the fecal coliform loads to the reservoir that result from roosting birds during the migratory season. The program includes three activities: avian population monitoring, avian deterrence activities and avian harassment. NYCDEP will continue its Waterfowl Management Program in the Kensico basin, expand it to the West Branch, Rondout and Ashokan basins, and institute it in the Croton Falls and Cross River basins when water from those reservoirs is pumped into the Delaware Aqueduct.

Stormwater Control Program

The City will continue to support the future stormwater controls programs and will provide additional financial support for the stormwater retrofit program. The stormwater retrofit program is designed to fund stormwater best management practices at existing stormwater runoff problem areas throughout the watershed, thereby reducing the input of suspended solids, pathogens and excessive nutrients into the reservoir system. In addition, the City will augment this effort by funding a new program (to be coordinated with the counties and CWC) to identify and prioritize community stormwater needs and to prioritize the locations where

stormwater controls should be installed. It will also develop and implement a strategy to address stormwater runoff emergencies in a streamlined fashion.

Monitoring, Modeling and Geographic Information System (GIS)

NYCDEP's watershed monitoring and modeling programs form the basis of the City's ongoing assessment of watershed conditions, and are used by the City to evaluate and guide watershed protection programs and the overall management of its water supply. The City's GIS capability to manipulate spatial databases is critical to these efforts. There have been numerous changes to the City's watershed protection program since 1996, when the current monitoring system array was set up. As part of its 2001 Long-Term Watershed Protection Program, the City is performing a comprehensive review of all elements of the monitoring program and will redesign them to support data collection and watershed management objectives.

The City will continue to enhance and refine its terrestrial and reservoir models to better estimate the impacts of watershed protection and management activities. Model enhancements will also be used to support the implementation and evaluation of the total maximum daily load (TMDL) program in the watershed. The City will develop new GIS coverages including impervious surface, land use classification, parcel data refinement, updated wetland floodplain maps, and satellite imagery. This information will be critical in evaluating a number of watershed protection and remediation programs over the next several years as the City moves from program implementation to program evaluation. NYCDEP will provide access to, and actively disseminate to watershed stakeholders, a significant amount of data developed with these tools.

The application of the modeling, monitoring and GIS programs will be integral to the City's preparation of a new annual report, which will summarize water quality data throughout the watershed and analyze trends. In addition, the application of these tools will support a new periodic Watershed Protection Program Assessment, to be conducted by the City every 5 years. The assessment will provide a comprehensive, basin-by-basin integrated analysis of watershed protection programs and accompanying data. The City will widely distribute these reports to stakeholders.

Filtration and Ultraviolet (UV) Disinfection Facilities

As a condition of relief from FAD requirements relating to the final design of filtration facilities for the Catskill/Delaware water supply system, the City has agreed to a schedule, included in its 2001 Long-Term Watershed Protection Program, for the feasibility study, design and construction of UV disinfection facilities. This additional disinfection barrier will significantly enhance the City's water supply protection program. In addition, to ensure that the

Catskill/Delaware filtration plant preliminary design documents do not become obsolete, the City will update the design every two years.

Education and Outreach

The City will continue and, in many areas, expand its education and outreach efforts both in the City and throughout the watershed. As noted above, the Long-Term Watershed Protection Program includes the production of two new, major reports that will provide watershed stakeholders with comprehensive information on watershed water quality and on the status/evaluation of watershed protection programs. In addition, the City will publish a semi-annual watershed newsletter and expand the amount of information that it provides on its web-page. The City will also provide additional financial support, as needed, to support the Catskill Watershed Corporation's education program. This program has provided, among other things, numerous grants to upstate and downstate educational institutions promoting awareness of the importance of the New York City watershed. The City will also significantly expand its outreach efforts on various aspects of its Watershed Rules and Regulations and SEQRA.

In addition to the above, the City will continue to implement and refine important in-City programs such as its Waterborne Disease Risk Assessment and Cross Connection Programs, both necessary for maintaining filtration avoidance.

The December 2001 Long-Term Watershed Protection Program also provides a detailed description of the various units within NYCDEP that support its watershed protection program and how they interact to accomplish program goals. The City has committed "the staff, funds, and expertise necessary to support all elements of the watershed protection program and to meet all associated milestones." It will identify any additional resources that may be necessary in certain program areas and the steps the City is taking to meet those needs. On a yearly basis, it will update a detailed staffing table and provide written documentation confirming that resource and funding levels are adequate to support the watershed protection program. EPA will track the City's resource levels closely since full implementation of the City's Long-Term Watershed Protection Program, along with continued filtration avoidance, will hinge upon the City's ability to maintain staff levels, with the necessary expertise, to effectively conduct the program.

Water supply security is also an important component of water supply protection. To that end, the City has significantly increased the amount of police patrols in the watershed and increased the police presence at key water supply locations. In addition, the City is currently working with the U.S. Army Corps of Engineers on a comprehensive program to evaluate any additional water supply security needs, and to implement those measures determined by the City to be cost effective in addressing such needs. EPA will continue to work with other federal government agencies, the State and City to ensure that there are tools in place and resources available to safeguard the City's drinking water supply.

It is EPA's determination that the City's 2001 Long-Term Watershed Protection Program along

with the milestones and clarifications/additions set forth in this determination, if complied with, will achieve the objectives of the Safe Drinking Water Act and the Surface Water Treatment Rule for unfiltered systems. The City has developed a program that, when fully implemented, substantially addresses the issues raised in the FAD Mid-Course Review. EPA also believes that the program takes into consideration the issues raised by stakeholders during the summer and fall of 2001, and during the summer 2002 public comment period. This determination requires that NYCDEP fully implement the 2001 Long-Term Watershed Protection Program (which is attached) and that it meet the milestones and clarifications/additions set forth in this determination. (EPA notes that the City is required to meet the milestone date or requirement in this determination in instances where it differs from that in the City's Long-Term Watershed Protection Program.)

EPA, in partnership with NYSDOH, intends to formally evaluate, by July 2006, (1) the progress the City is making in implementing its Long-Term Watershed Protection Program and (2) the City's compliance with this determination. The review will include input from NYCDEP and watershed stakeholders. It is expected that the outcome of this review will be a commitment by the City, by December 14, 2006, to additional Long-Term Watershed Protection Program milestones through 2012 as well as a commitment to any program changes required by EPA and NYSDOH. This commitment, which will be in the form of a revised Long-Term Watershed Protection Program, will be the basis of EPA's next revision to this determination, scheduled for April 2007. At any time, EPA or the primacy agency may make a determination that the City's watershed program no longer provides adequate protection of the City's water supply, pursuant to the SWTR and/or other avoidance criteria in the SWTR and require the City to filter its Catskill/Delaware water supply.

2. SWTR Objective Criteria Compliance

The Surface Water Treatment Rule at 40 CFR §141.71 and the Interim Enhanced Surface Water Treatment Rule at 40 CFR §141.171 require that all surface water supplies provide filtration unless certain source water quality, disinfection, and site-specific avoidance criteria are met. In addition, the supplier must comply with: (1) the Total Coliform Rule and (2) the Stage 1 Disinfectant and Disinfection Byproducts Rule. The 1997 FAD required ongoing monitoring and monthly, quarterly, and semi-annual reporting related to SDWA compliance activities.

The 2002 FAD requires the continuation of the above monitoring requirements as specified in Section 6.2 of the City's Long-Term Watershed Protection Program (SWTR Objective Criteria Compliance) and in accordance with the reporting requirements below:

Requirement	Due Date
Continue to meet SWTR Objective Criteria (Sections §141.71 and §141.171) and submit reports and certification of compliance on: • §141.71(a)(1) - raw water fecal coliform concentrations • §141.71(a)(2) - raw water turbidity sampling • §141.71(b)(1)(i)/§141.72(a)(1) - raw water disinfection CT values • §141.71(b)(1)(ii)/§141.72(a)(2) - operational status of Kensico and Hillview disinfection facilities including generators and alarm systems • §141.71(b)(1)(iii)/§141.72(a)(3) - entry point chlorine residual levels • §141.71(b)(1)(iv)/§141.72(a)(4) - distribution system disinfection levels (NYCDEP will include a discussion of any remedial measures taken if chlorine residual levels are not maintained throughout system) • §141.71(b)(5) - distribution system coliform monitoring including a summary of the number of samples taken, how many tested positive for total coliform, whether the required number of repeat samples were taken at the required locations, and which, if any, total coliform positive samples were also *E. coli* positive. For each *E. coli* positive sample, include the investigation of potential causes, problems identified and what has or will be done to remediate problems. Include copies of any public notices issued as well as dates and frequency of issuance. • operational status of UV facilities (upon start-up - expected in 2009) including generators and alarm systems	monthly
All requirements described in Section § 141.71(b)(4) must continue to be met. Notify EPA and NYSDOH within twenty-four hours of any suspected waterborne disease outbreak.	continuous

All requirements described in Section §141.71(b)(6) and §141.171 must continue to be met. Submit report on disinfection byproduct monitoring results.	quarterly
Notify EPA and NYSDOH within twenty-four hours, if at any time the chlorine residual falls below 0.2 mg/l in the water entering the distribution system.	continuous
Notify EPA and NYSDOH by the close of the next business day, whether or not the chlorine residual was restored within 4 hours.	continuous
Notify EPA and NYSDOH by the end of the day when a sample tested positive for *E. coli*.	continuous
Report on the operational status of Kensico Reservoir, West Branch Reservoir (on-line or by-pass), Hillview Reservoir, and whether any of these reservoirs experienced unusual water quality problems.	monthly
The City will continue working with the U.S. Army Corps of Engineers on a comprehensive program to evaluate any additional water supply security needs, and to implement those measures determined by the City to be cost effective in addressing such needs.	continuous
Regarding the use of Croton Falls and Cross River source water: (A) The City shall not introduce Croton Falls or Cross River source water into the Catskill/Delaware water supply system without the prior written approval of EPA and NYSDOH; (B) Until filtration of the Croton system has been achieved under the Judicial Order on Consent, including any supplements, in United States v. City of New York, 97-CV-2154 (NG), City must meet, at a minimum, the following two additional conditions for EPA and NYSDOH to consider approving the introduction, into the Catskill/Delaware water supply system, of water from the Croton Falls and Cross River watersheds: (1) the City is in substantial compliance with those watershed protection program elements being implemented in the Croton Falls and Cross River watersheds that are contained in this Determination; and (2) the City has submitted all relevant water quality data.	continuous

3. Environmental Infrastructure

3.1 Septic and Sewer Programs

EPA has required NYCDEP to conduct several activities with respect to identifying, remediating and preventing failing septic systems throughout the watershed. The 1997 FAD required that NYCDEP submit a detailed methodology for prioritizing routine inspections to detect septic system failures. It also required that NYCDEP develop and implement a septic rehabilitation and replacement program in the west-of-Hudson watershed.

NYCDEP has developed a comprehensive Septic Program to achieve the objective of detecting and remediating failing or likely-to-fail systems. The Septic Program is included in the City's 2001 Long-Term Watershed Protection Program (Section 6.3.1 - 6.3.3 and Appendix G) and is composed of the following elements:

- Septic Remediation and Replacement Program (Section 6.3.1),
- Septic Maintenance Program (Section 6.3.1),
- Sewer Extension Program (Section 6.3.1),
- New Infrastructure Program (Section 6.3.2), and
- Community Wastewater Management Program (Section 6.3.3).

Also integral to the program is the implementation and enforcement of the Watershed Rules and Regulations (Section 6.6.1).

The FAD requires that NYCDEP implement the Septic Program as detailed in Chapter 6.3.1 - 6.3.3 and Appendix G of the City's 2001 Long-Term Watershed Protection Program in accordance with the milestones contained therein and in accordance any additions/clarifications below:

Septic Remediation and Replacement Program - Milestone/Reporting Requirements

Requirement	Due Date
Execute contract changes with CWC in support of the Septic Remediation and Replacement Program that include funding levels sufficient to address approximately 300 septic systems per year. NYCDEP will work with CWC to continue the hardship component of the Septic Remediation and Replacement Program for critical septic system remediations/replacements in non-priority areas.	11/30/02
Report on implementation of the Septic Remediation and Replacement Program. Include discussion on actions taken to remediate failed septics located within the New Sewage Infrastructure Program or the Sewer Extension Program areas once a community is identified as no longer participating in these programs.	semi-annually

Septic Maintenance Program - Milestone/Reporting Requirements

Requirement	Due Date
Execute Septic Maintenance Program contract with CWC to address the operation and maintenance of septic systems.	12/31/02
Submit CWC program rules for Septic Maintenance Program.	9/30/03
Report on implementation of Septic Maintenance Program.	semi-annually

Sewer Extension Program - Milestone/Reporting Requirements

Requirement	Due Date
Execute contracts for implementation of the Sewer Extension Program in the following communities: Community — WWTP Hunter & Haines Falls — New York City - Tannersville Neversink — New York City -Grahamsville Roxbury — New York City -Grand Gorge Shandaken — New York City -Pine Hill Middletown — New York City -Margaretville	10/1/02
Submit FAD implementation milestones to EPA 30 days after contract execution.	11/1/02
In the event that a community (or communities) does not participate in the Program, submit a plan to EPA, including implementation milestones, for re-allocating funding for additional potential extensions.	11/1/02
Assist participating communities in their adoption and maintenance of appropriate sewer use ordinances in accordance with the 1997 Watershed MOA.	continuous
Submit sewer use ordinances	upon completion of final design
Submit information assuring that future growth within the service area can be adequately serviced by, and will not exceed the capacity of, the sewerage collection system and the WWTP to which it is connected.	upon completion of final design
Submit an assessment of potential sewer extension areas previously identified by NYCDEP but not selected for funding under the Sewer Extension Program, analyzing whether and how (in both cases, on the basis of cost-effectiveness and direct/indirect water quality impacts) septic systems in those areas should	1/30/03

be addressed (e.g., through additional sewer extensions or through other NYCDEP or CWC programs). Report on implementation of the Sewer Extension Program, including the adoption and maintenance of sewer use ordinances and the progress in meeting FAD implementation milestones.	semi-annually

3.2 New Infrastructure Program

The City will implement the New Infrastructure Program in accordance with the City's Long- Term Watershed Protection Program (6.3.2) with clarifications below:

- NYCDEP will provide approval of functional completion and authorization to begin start up & performance testing within 45 days of engineer's submittal of Functional Completion Certification;
- NYCDEP will work with communities to ensure milestones are met and will review and provide regulatory or document approval in a timely manner;
- NYCDEP will enter into written agreements with the town or village in which any new WWTP or community septic is constructed with New Infrastructure Funds, to provide funds to pay for the continuing operation and maintenance costs in accordance with the 1997 Watershed MOA;

and in accordance with the following schedule:

Municipality	Milestone Schedule			
	Design/Construction Amendment Execution	Final Design Complete	Construction Bids Complete	Engineer's Cert. of Functional Completion
Roxbury	completed	completed	9/30/2002	9/30/2004
Andes	completed	completed	9/30/2002	9/30/2004
Windham	completed	completed	11/30/2002	11/30/2004
Fleischmanns	completed	9/14/2002	2/14/2003	2/14/2005
Hunter	completed	9/24/2002	3/24/2003	3/24/2005
Phoenicia & Prattsville	10/31/02	4/30/04	10/31/04	10/31/06
Submit all information used to determine service area and WWTP flow capacity.				9/30/02
Assist participating communities in their adoption and maintenance of appropriate sewer use ordinances in accordance with the 1997 Watershed MOA.				continuous
Submit sewer use ordinances				upon

	completion of final design
Report on implementation of the New Infrastructure Program, including progress in executing operation and maintenance agreements with applicable town or village, adoption and maintenance of sewer use ordinances, and progress in meeting FAD implementation milestones.	semi-annually
Report, in spreadsheet format, the progress in meeting program milestones. For each milestone missed or anticipated to be missed, include in the report an explanation for the delay and actions taken or to be taken to bring the program back on schedule.	quarterly

3.3 Community Wastewater Management Program

The City will implement the Community Wastewater Management Program in accordance with Section 6.3.3 of the City's Long Term Watershed Protection Program with clarifications below:

- NYCDEP will provide sufficient block grant funding that will enable the implementation of wastewater solutions (e.g., septic maintenance districts and/or community or cluster septic systems) for 5 communities prioritized in Section 6.3.3 of the City's 2001 Long-Term Watershed Protection Program, if they elect to participate in the program;

- NYCDEP will work with communities to ensure milestones are met and will review and provide regulatory or document approval in a timely manner;

and in accordance with the following schedule:

Requirement	Due Date
Execute Contract with CWC for implementation of the Community Wastewater Management Program for 5 participating communities	11/30/02
• CWC to Adopt Program Rules.....	2/28/03
• CWC to Solicit Community Interest.....	5/31/03
• CWC Executes Implementation Contracts.....	8/31/03
• Community Hires Consultant.....	11/30/03
• Community Study/Design Complete.....	11/30/04
• Construction Complete.....	11/30/06
Report on implementation of the Community Wastewater Management Program including any City involvement in wastewater solutions for any of the 8 - 22 communities listed in paragraph 122(c) of the Watershed MOA.	semi-annually
Report, in spreadsheet format, on the progress in meeting program milestones. For each milestone missed or anticipated to be missed, include in the report an explanation for the delay and actions taken or to be taken to bring the program back on schedule.	quarterly

3.4 WWTP Upgrade Program

The WWTP Upgrade Program constitutes the installation of advanced tertiary treatment (microfiltration or approved equivalent) and phosphorus removal at all surface water discharging WWTPs, the decommissioning and connection of certain existing WWTPs to existing or new sewage treatment infrastructure facilities, and the installation of phosphorus removal and disinfection, where applicable, at all subsurface discharging WWTPs within the New York City watershed. NYCDEP, with the assistance of New York State Environmental Facilities Corporation (NYSEFC), will administer the City's WWTP Upgrade Program in accordance with Chapter 6.3.4 of NYCDEP's Long-Term Watershed Protection Program with the following clarifications/additions:

- For all WWTPs identified in the "WWTP Upgrade Milestone Schedule" table, below, SPDES permits require WWTP owners to comply with final effluent discharge requirements six months from the date of NYCDEP's approval of functional completion of the facility's upgrade. The approval date is specified in this determination.

- For all newly identified subsurface discharging WWTPs, NYCDEP will work with NYSDEC to draft and issue final modified SPDES permits with specific compliance schedules to complete construction and comply with all treatment, discharge, and operation and maintenance (O&M) requirements contained in the Watershed Rules and Regulations.

- NYCDEP and NYSEFC will assist all WWTP owners in developing and implementing appropriate O&M agreements in accordance with NYSEFC/WWTP owner upgrade contracts. Consistent with SPDES permits and NYS 6NYCRR Part 650 regulations, NYCDEP will ensure that O&M agreements provide for adequate WWTP operator certification and plant supervision/coverage.

- NYCDEP will work with NYSDEC, in accordance with State Law, to modify and issue appropriate SPDES permits with specific requirements for the decommissioning and connection of existing WWTPs to other (new or existing) WWTP facilities.

- NYCDEP will provide an upgrade schedule for a WWTP facility within 60 days of a determination that such facility is required to be upgraded pursuant the Watershed Rules and Regulations.

and in accordance with the following program requirements and associated milestones:

Milestone Requirements: NYCDEP will work with NYSEFC and non-New York City WWTP owners to obtain functional completion of Regulatory Upgrades and to comply with all advanced treatment requirements (i.e., microfiltration or approved equivalent) and phosphorus removal, as required by the Watershed Rules and Regulations, NYSEFC-WWTP Owner Upgrade Agreements, and NYSDEC SPDES permits, in accordance with the schedule below:

WWTP	WWTP Upgrade Milestone Schedule					
	PUP Approval	FUP Approval	Construction Start Up	Engineer's Cert. of Functional Completion	NYCDEP's Auth. Start Up & Perform. Testing**	Flow
Mountainside Dairy Farms*	completed	completed	completed	completed	completed	0.0498
Hunter Highlands*	completed	completed	completed	completed	completed	0.040
Village of Delhi (includes Ultra Dairy-DMV connection)*	completed	completed	completed	completed	completed	0.715
Village of Hobart*	completed	completed	completed	completed	completed	0.160
Village of Stamford*	completed	completed	completed	completed	completed	0.500
Village of Walton*	completed	completed	completed	completed	completed	1.170
Allen Residential connection to Hobart WWTP	completed	completed	completed	completed	completed	0.020
Harriman Lodge	completed	completed	completed	completed	completed	0.020
SEVA Institute (see Note 1)	9/30/02	12/31/02	6/30/03	12/31/03	2/15/04	0.0078
Camp Nubar (see Note 2)	12/31/02	3/31/03	9/30/03	12/31/03	2/15/04	0.0125
Latvian Church Camp	completed	completed	12/31/02	6/30/03	8/15/03	0.007
Roxbury Run Village	completed	completed	12/31/02	9/30/03	11/15/03	0.035
Clear Pool Camp	completed	completed	12/31/02	9/30/03	11/15/03	0.020
Mountainside Inn (see Note 2)	3/31/03	6/30/03	6/30/03	12/31/03	2/15/04	0.0031
Olive Woods (Rotron)	completed	9/30/02	12/31/02	6/30/03	8/15/03	0.0128
Golden Acres Farm	12/31/02	3/31/03	6/30/03	3/31/04	5/15/04	0.0092

WWTP	WWTP Upgrade Milestone Schedule					
	PUP Approval	FUP Approval	Construction Start Up	Engineer's Cert. of Functional Completion	NYCDEP's Auth. Start Up & Perform. Testing**	Flow
Onteora Cent. School	completed	9/30/02	12/31/02	9/30/03	11/15/03	0.027
Ron De Voo Restaurant (see Note 3)	6/30/03	12/31/03	3/31/04	11/15/04	12/31/04	0.0010
Whistle Tree (see Note 4)	12/31/02	3/31/03	6/30/03	3/31/04	5/15/04	0.0125
Camp L'man Achai (a.k.a. Tai Chi Camp)	9/30/02	12/31/02	6/30/03	3/31/04	5/15/04	0.0075
Camp Timberlake	3/31/03	6/30/03	6/30/03	6/30/04	8/15/04	0.034
Delaware BOCES	completed	9/30/02	9/30/02	9/30/04	11/15/04	0.0025
Elka Park (see Notes 2 and 4)	3/31/03	6/30/03	6/30/03	12/31/03	2/15/04	0.010
Mountain View Estates 1 (see Note 4)	6/30/03	9/30/03	9/30/03	6/30/04	8/15/04	0.007
Mountain View Estates 2 (see Note 4)	6/30/03	9/30/03	9/30/03	6/30/04	8/15/04	0.006

* WWTPs committed by NYCDEP to be upgraded by 6/30/02 as part of NYCDEP's request for relief from certain requirements relating to Catskill/Delaware filtration design. Represents approximately 83% of the total Non-City-Owned WWTP flow to the Catskill/Delaware watershed.

** NYCDEP's approval of functional completion and authorization to begin startup and performance testing will be within 45 days of engineer's submittal of Functional Completion Certification. It is possible that for some seasonal facilities, construction may be completed during the off season; in those cases authorization to begin startup will be within 45 days of engineer's submittal of Functional Completion Certification, or at the start of the next seasonal operations, whichever is later.

Note 1: Schedule assumes hold and haul. If a surface or sub-surface discharging WWTP is constructed, functional completion will be delayed 6 months.

Note 2: Schedule assumes construction of a sub-surface discharging WWTP. If a surface discharging WWTP is constructed, functional completion will be delayed 6 months.

Note 3: Schedule assumes a stand-alone upgrade. This facility is on a dual track: stand-alone upgrade and

WWTP	WWTP Upgrade Milestone Schedule					
	PUP Approval	FUP Approval	Construction Start Up	Engineer's Cert. of Functional Completion	NYCDEP's Auth. Start Up & Perform. Testing**	Flow
NYC purchase of the property. NYC purchase of the property is the owner's preferred option. If the purchase option is viable, functional completion (which would be equivalent to the transfer of the property to the City) would be 9 months earlier. Note 4: WWTP owner's original engineer was terminated.						

Milestone Requirements for Interim Treatment: NYCDEP will work with NYSEFC to install interim enhanced treatment [ultraviolet (UV) disinfection] at the following existing WWTPs, which will not perform regulatory upgrades, but instead will connect to New Infrastructure Program (NIP) facilities, in accordance with the schedule below: (NYCDEP will assure adequate operation and maintenance is performed until the connection occurs.)

Existing WWTP (Flow in GPD)	WWTP Interim Treatment Milestone Schedule			
	Signed Amended EFC-owner Contract	Approved Interim UVSystem Final Design	Interim UV System Functional Completion	Connect to NIP Facilities
Frog House (2,000)* Snow Time, Inc. (120,000) Thompson House (5,000)	9/30/02	3/31/03	9/30/03	1/15/05 (Windham)
Regis Hotel (9,600)	9/30/02	3/31/03	9/30/03	3/31/05 (Fleischmanns)
Camp Loyaltown (21,000) Colonel's Chair (30,000) Forester Motor Lodge (5,000) Liftside (81,000)	9/30/02	3/31/03	9/30/03	5/8/05 (Hunter)
* This is a SPDES permitted subsurface WWTP which is not required to install microfiltration or equivalent technology; however, the owner employs a contract operator and provides enhanced treatment (UV disinfection) prior to discharge to groundwater.				

Milestone Requirements for Newly Identified WWTPs: NYCDEP will work with NYSEFC, NYSDEC, and facility owners to complete regulatory upgrades with O&M contract agreements for all identified WWTPs discharging in the watershed to install sand filtration, phosphorus removal, and disinfection (where applicable) in accordance with the Watershed Rules and Regulations and the following schedule:[1]

Newly Identified WWTP Upgrade Milestone Schedule	
EFC-WWTP Owner Upgrade Contract Signed*	12/31/02
NYCDEP approved Engineering Contract	6/30/03
NYCDEP approved Facility Plan	12/31/03
NYCDEP approved Preliminary Upgrade Plan	6/30/04
NYCDEP approved Final Upgrade Plan	9/30/04
Engineer's submittal of Functional Completion Certification**	6/30/05

* Palace Hotel and Windham Mountain Village are candidates for connection to New Sewage Treatment Infrastructure Program WWTPs and may choose to opt-out of the upgrade program. Sportsman's Diner is a candidate to connect to the Sewer Extension Program WWTP and may choose to opt-out of the upgrade program.

** NYCDEP's approval of functional completion and authorization to begin startup and performance testing will be within 45 days of engineer's submittal of Functional Completion Certification.

[1] Newly Identified Facilities include Batavia Kill Recreational Area, Bread Alone, Cortina Valley Ski, KJ Western Playground, Latvian American Disabled Veterans, Palace Hotel, Sportsman's Diner, White Birches Campsite, Windham Mountain Village, Windham Ridge Club

An additional facility, Camp Oh Neh Tah, was identified in mid-2002. The upgrade schedule for that facility will be six months behind each of the above milestones.

Reporting Requirements:

Requirement	Due Date
Report, in spreadsheet format, on the progress of all surface and subsurface WWTP upgrades in meeting project milestones, including progress at those facilities being installed with interim UV systems and at WWTPs being upgraded in Croton Falls and Cross River basins.	monthly
Report on the status of each of the above program requirements. In addition, for each WWTP in which a milestone is missed or anticipated to be missed, provide an explanation for the delay or anticipated delay and actions taken or to be taken to bring the facility back on schedule.	quarterly

3.5 Stormwater Programs

As a result of the MOA, NYCDEP established the following programs: (1) Future Stormwater Controls paid for by the City for Single Family Houses, Small Businesses and Low Income Housing Program and the West-of-Hudson Future Stormwater Controls Program (administered by the Catskill Watershed Corporation (CWC)). These programs provide financial support for the cost of designing, constructing and in some cases maintaining stormwater controls that are required by the 1997 Watershed Rules and Regulations, but not otherwise required by Federal or State law, for certain new development projects. In addition, the Stormwater Retrofit Program, also administered by CWC, was established in the MOA to address existing stormwater runoff problems through the construction of stormwater best management practices in concentrated areas of impervious surfaces in the west-of-Hudson watershed.

Section 6.3.5 of the City's 2001 Long-Term Watershed Protection Program includes details of its revised Stormwater Programs. NYCDEP will continue to provide support for the Future Stormwater Programs through existing funding commitments. NYCDEP will provide additional funding to the Stormwater Retrofit Program to sufficiently sustain the historical project activity level of the program. In addition, the City will develop and fund a new component of the Stormwater Retrofit Program that will support the performance of community-wide stormwater infrastructure assessments and planning.

EPA's FAD requires the City to implement Section 6.3.5 (Stormwater Programs) of its 2001 Long-Term Watershed Protection Program in accordance with the milestones therein, with the following modification/addition:

- The City will develop and implement an effective strategy to address stormwater emergencies on non-City-owned land.

Reporting Requirements

Requirement	Due Date
Report on the implementation of: • Future Stormwater Controls Paid for by the City for Single Family Houses, Small Businesses, and Low Income Housing Program, and • Stormwater Retrofit Program, including: (1) the development of program rules to continue and expand program, (2) the implementation and effectiveness of community-wide stormwater infrastructure assessment and planning program and (3) the efforts to expedite stormwater emergency remediations and program rules.	annually
Amend the Stormwater Retrofit Program: (1) to provide additional program funding, and (2) to support community-wide stormwater infrastructure assessment and planning in accordance with Section 6.3.5 of the Long-Term Watershed Protection Program.	11/30/02
The City will develop and implement an effective strategy to address stormwater emergencies on non-City-owned land.	11/30/02

4. Protection and Remediation Programs

4.1 Waterfowl Management Program

The 1997 FAD required NYCDEP to continue to implement its Waterfowl Management Program in the Kensico basin, a program the City instituted in 1993 due to elevated coliform bacteria levels in the Kensico Reservoir. The objective of the program is to minimize the fecal coliform loads to the reservoir that results from roosting birds during the migratory season. The program includes three activities: avian population monitoring, avian deterrence activities and avian harassment. The City's 2001 Long-Term Watershed Protection Program includes an expansion of its Waterfowl Management Program into West Branch, Rondout and Ashokan Reservoirs. The Avian Management component of the program will be implemented in these basins as needed.

The FAD requires that NYCDEP implement its expanded Waterfowl Management Program in accordance with Section 6.4.1 of the City's Long-Term Watershed Protection Program and the milestones therein with the following clarifications:

- NYCDEP will conduct bird monitoring at Ashokan, Rondout and West Branch Reservoirs biweekly at a minimum. NYCDEP expects to increase bird survey frequency when judged necessary to make appropriate waterfowl management decisions.

- NYCDEP will conduct bird monitoring at the Croton Falls and Cross River Reservoirs, on a biweekly basis, making best efforts to monitor one month prior to the City's proposed use of the Reservoir's associated pump station. Subsequent to start-up of the Reservoir's pump station, NYCDEP will continue bird monitoring on a biweekly basis, increasing bird survey frequency when judged necessary to make appropriate waterfowl management decisions.

- NYCDEP will implement the Avian Management component of the program at Ashokan, Rondout, West Branch Reservoirs "as needed". The term "as needed" refers to active bird management measures implemented based on the following criteria:
  - Current bird populations, including roosting or staging locations relative to water intakes;
  - Fecal coliform bacteria concentrations approaching or exceeding 20 colony-forming units at reservoir effluent structures coincident with elevated bird populations;
  - Recent weather events;
  - Operational flow conditions within the reservoir (e.g., elevations and flow patterns and amounts);
  - Reservoir ice coverage and watershed snow cover; and
  - An assessment that active bird management measures would be effective in reducing bird populations and fecal coliform bacteria levels.

- NYCDEP will implement the Avian Management component of the program at Croton Falls and Cross River, as needed, one month prior to the City's proposed use of the Reservoir's associated pump station and subsequent to start-up.

Reporting Requirement

Requirement	Due Date
Report on implementation and analysis of all elements (including special studies) of the Waterfowl Management Program.	annually (July 31)

4.2 Land Acquisition

Land acquisition is one of the most effective, and therefore, important mechanisms to permanently protect the City's Catskill/Delaware watershed. The Land Acquisition and Stewardship Program, which is described in detail in the New York City Watershed MOA (1997), seeks to prevent future degradation of water quality by acquiring sensitive lands and by managing the uses on these lands. The overarching goal of the program is to ensure that undeveloped, environmentally-sensitive watershed lands remain protected and that the watershed continues to be a source of high-quality drinking water to the City and upstate counties. The City will continue to work with partner organizations such as WAC, NYSDEC, the counties and local and regional land trusts to complement and enhance the City's acquisition program.

The FAD requires that the City continue to implement its Land Acquisition Program (Section 6.4.2 of its Long-Term Watershed Protection Program) in accordance with the MOA and the following clarifications/additions:

- Upon receipt of a positive response from a landowner to a solicitation from the City, begin to proceed through a specified series of steps to acquire an interest in such parcel in perpetuity. The City may petition EPA for relief from the requirement that it purchase a parcel of property where the cost of the property is disproportionate to the water quality benefits obtained by the acquisition of that parcel.

- The City shall work with the New York State Department of State to issue, prior to January 1, 2006, a written communication to each Town or Village which previously exercised an election under paragraph 68 of the MOA to exclude certain land from fee acquisition by the City, of such Town's or Village's right, pursuant to paragraph 68(c)(ii) of the MOA, to revisit and rescind such exclusion between January 1, 2006 and June 30, 2006.

- As provided for in the MOA and the Water Supply Permit, the City will continue to resolicit landowners, especially in the higher priority areas. The City will submit to EPA the strategy, with resolicitation targets by basin, used to guide those resolicitation efforts.

Milestone/Reporting Requirements

Requirement	Due Date
As provided for in the MOA and the Water Supply Permit, the City will continue to resolicit landowners, especially in the higher priority areas. The City will submit to EPA the strategy, with resolicitation targets by basin, used to guide those resolicitation efforts.	3/31/03
Solicit 20,081 acres in priority area 3; 28,450 acres in priority area 4 - total 48,531	1/21/03
Solicit 14,558 acres in priority area 3; 33,243 in priority area 4 - total 47,800	1/21/05
Complete solicitation of a total of 68,700 acres in Schoharie basin; 78,630 acres in Pepacton basin; 105,028 acres in Cannonsville basin - total 252,358	1/21/05

Complete solicitation of a minimum of 61,750 acres in priority area 1; 42,300 acres in priority area 2; 96,000 acres in priority area 3; 155,000 in priority area 4 - total 355,050	1/21/07
If EPA/NYSDOH determine it to be necessary, NYCDEP will establish an additional $50 million for land acquisition in the segregated account, bringing the aggregate total to $300 million. EPA/DOH and NYCDEP will consult biennially.	biennially (commencing 1/31/04)
The City shall request NYSDEC to renew Water Supply Permit #0-9999-00051/00001 to conduct the land acquisition program for an additional 5 years by 1/21/06.	1/21/06
The City shall work with the New York State Department of State to issue, prior to January 1, 2006, a written communication to each Town or Village which previously exercised an election under paragraph 68 of the MOA to exclude certain land from fee acquisition by the City, of such Town's or Village's right, pursuant to paragraph 68(c)(ii) of the MOA, to revisit and rescind such exclusion between January 1, 2006 and June 30, 2006.	1/1/06 (report quarterly on this activity commencing 7/31/05)
Reporting: Provide a status report which includes updates on the number of acres solicited and acquired in each basin and priority area, implementation of the out-of-basin prioritization strategy, resolicitation efforts in accordance with the City's resolicitation strategy, the time between contract signing and closing, and efforts made to reduce the time between contract signing to closing. In addition, the report will include information on Kensico acquisition efforts.	quarterly

4.3 Watershed Agricultural Program

The 1997 FAD required the continued implementation of a Watershed Agricultural Program (WAP) and an evaluation of the program every two years. The overall objective of the program is to prevent pollution and improve water quality by reducing pollutants leaving farms through the implementation of best management practices. The WAP is designed to meet these objectives through the development and implementation of Whole Farm Plans on at least 85% of the farms in the New York City watershed. The program has met its participation and implementation goals to date.

City's 2001 Long-Term Watershed Protection Program includes a modified and expanded WAP (Section 6.4.3). The FAD requires the City to implement the Watershed Agricultural Program as detailed in Section 6.4.3 and Appendices I and J of the City's Long-Term Watershed Protection Program, in accordance with the milestones therein and the clarification below:

- Whole Farm Plans (WFPs) are "substantially implemented" when seven of the nine highest priority pollutant categories have been addressed and the remaining two pollutant categories' BMPs are scheduled for implementation within the next two years, at which time the farms will be considered "fully implemented."

Milestone/Reporting Requirements

<table>
<tr><th colspan="4">Requirement</th><th>Due Date</th></tr>
<tr><td colspan="4">Report on:
• FAD program goals
• Fluctuation in number of farms with approved WFPs and impact on FAD program goals
• Continuation of WAC farm recruitment
• Small Farms Program
• Croton Agricultural Program
• Conservation Reserve Enhancement Program
• Agricultural Easement Program</td><td>semi-annually</td></tr>
<tr><td>WFP Impl. Agreements</td><td>Commenced Implementation</td><td>Farms Substantially Implemented</td><td>Annual Follow-up</td><td></td></tr>
<tr><td>297</td><td>250</td><td>143</td><td>105</td><td>12/31/02</td></tr>
<tr><td></td><td>288</td><td>181</td><td>143</td><td>12/31/03</td></tr>
<tr><td></td><td>All participating Farms</td><td>219</td><td>181</td><td>12/31/04</td></tr>
<tr><td></td><td></td><td>257</td><td>219</td><td>12/31/05</td></tr>
<tr><td></td><td></td><td>All participating Farms</td><td>257</td><td>12/31/06</td></tr>
<tr><td colspan="4">Establish a definition of "Nutrient Management Plan", consistent with Natural Resources Conservation Service's (NRCS) National Handbook of Conservation Practices Standard 590, and designed to meet the water quality goals of New York City and the practicalities of the program.</td><td>completed</td></tr>
<tr><td colspan="4">Develop and submit WOH Small Farm Program Plan.</td><td>9/30/02</td></tr>
</table>

Submit five-year plan.	10/31/03
Submit evaluation of the Watershed Agricultural Program based on evaluation criteria.	biennially (commencing 2/04)
Complete review of evaluation criteria with input from Advisory Committee.	12/31/05
Submit annual implementation plan which includes program goals for numbers of WFP Implementation Agreements, farms with implementation commenced, farms substantially implemented, annual follow-up and nutrient management planning.	annually (January 31)
Submit Research Report on research supported by the Watershed Agricultural Program (City and non-City funds).	annually (October 31)
Publish draft agricultural regulations, if based on a review of biennial evaluations EPA, in conjunction with NYSDOH, determines that the current WAP activities do not adequately control agricultural non-point source pollution, or if NYCDEP fails to meet the requirements of the WAP.	within 9 months of EPA's determination

4.4 Watershed Forestry Program

The Watershed Forestry Program is a voluntary partnership between New York City and the forestry community that supports and maintains well-managed forests as a beneficial land use in the watershed. The primary objective of the program is to maintain unfragmented forested land and promote the use of management practices to prevent non-point source pollution during timber harvests.

The Watershed Forestry Program, which began as a grass-roots effort, was incorporated into NYCDEP's Non-point Source Pollution Control Strategy, which was submitted in accordance with the 1997 FAD. The program provides resources for logger training, forest management planning, implementation of management practices, research, demonstration projects and educational opportunities. NYCDEP's 2001 Long-Term Watershed Protection Program contains a Watershed Forestry Program component (Section 6.4.4).

The FAD requires that NYCDEP implement the Watershed Forestry Program in accordance with Section 6.4.4 of the City's 2001 Long Term Watershed Protection Program and the milestones therein.

Reporting Requirements

Requirement	Due Date
Report on: - Logger Training - Research, Demonstration and Education - Forest Management Planning (including riparian buffer planning) - BMP Implementation	semi-annually
Evaluate the 5-year implementation status of forest management plans. This will include documenting and assessing the degree to which private landowners follow the forestry management practices recommended in their 10-year management plans.	annually (commencing 1/31/03)

4.5 Stream Management Program

The 1993 FAD required the submittal of a Stream Corridor Protection Plan which is the basis for the existing Stream Management Program. The overall objective of the Stream Management Program is to increase stream system stability through the development and implementation of stream management plans and demonstration projects, and to enhance long-term stream stewardship through increased community participation. Stabilizing stream reaches is expected to provide multiple environmental benefits including overall water quality improvement and turbidity reduction through decreased streambank erosion. The City's 2001 Long-Term Watershed Protection Program includes an enhanced Stream Management Program (Section 6.4.5 and Appendix K) with additional focus on restoration projects, stream management plan completion, and scientific review.

The FAD requires that the City implement all elements of the Stream Management Program, in accordance with Section 6.4.5 and Appendix K of NYCDEP's 2001 Long-Term Watershed Protection Program and the milestones therein, with the following clarifications/addition:

- As Stream Management Plans are developed, NYCDEP will evaluate recommendations made in the Plans, prioritize initiatives that are deemed by the City to be beneficial to water quality, determine an appropriate level of City technical and/or financial support, and work with other stakeholders to accomplish these projects in a timely manner. The City will report on these efforts, including impediments to progress, semi-annually.

- The City will submit a report on its efforts to protect riparian buffer areas including but not limited to, acquisition, CREP, watershed regulations, stream management plan, forestry program and education and outreach. The report will include (1) an inventory of stream miles and protection status, (2) a quantitative assessment of whether the City's efforts are effective and (3) recommendations and a plan for any needed enhancements or additions to the riparian buffer protection initiatives.

Milestone/Reporting Requirements

Requirement	Due Date
Schedule for Stream Management Plans and Demonstration Restoration Projects in priority watersheds:	
Broadstreet Hollow SMP	12/31/02
Chestnut Creek SMP	12/31/03
• restoration project (undetermined location)	12/31/03
Stony Clove Creek SMP	12/31/03
• Beecher Restoration Project	12/31/03
Batavia Kill SMP	12/31/02
• Red Falls Restoration Project	12/31/04
• Big Hollow Restoration Project	12/31/02
• Red Falls Monitoring Report	12/31/07
West Branch Delaware SMP	12/31/04
• restoration project (undetermined location)	12/31/04
West Kill SMP	12/31/05

• restoration project (undetermined location) Esopus Creek SMP • Woodland Valley East Branch Delaware SMP • restoration project (undetermined location) Schoharie Creek - including East Kill SMP • restoration project (undetermined location)	12/31/05 12/31/06 12/31/03 12/31/07 12/31/07 4/30/07 12/31/06
In addition to the stream restoration projects identified above, identify two additional restoration projects in Schoharie Reservoir Basin and one additional restoration project in either the Schoharie or Ashokan Reservoir basin and provide implementation schedules. Complete the 3 projects by 12/06 or earlier.	12/31/02 12/31/06
Submit to EPA Stream Management Plans	30 days of completion
For each Stream Management Plan that is completed, submit to EPA a report which prioritizes initiatives deemed by the City to be beneficial to water quality.	6 months from plan completion
Submit an updated list of all stream restoration projects that are not under NYCDEP's direction, with projected completion dates.	semi-annually
Provide semi-annual reports on status of the Stream Management Program, including the progress in implementing restoration projects and completing Stream Management Plans, and the progress in meeting the four programmatic goals.	semi-annually
Submit a final Stream Management Program Evaluation Strategy to support restoration designs and overall program effectiveness.	12/31/02
Provide a biennial report evaluating the implementation of the Stream Management Program including progress towards development and implementation of each Stream Management Plan, construction status for each demonstration restoration project, development status of stream geomorphic databases, discussion of ongoing research, and progress on non-NYCDEP funded restoration projects. In addition the report will provide an evaluation of each restoration project and review the progress in meeting program objectives.	biennially (commencing 4/30/04)
The City will submit a report on its efforts to protect riparian buffer areas including but not limited to, acquisition, CREP, watershed regulations, stream management plan, forestry program and education and outreach. The report will include (1) an inventory of stream miles and protection status, (2) a quantitative assessment of whether the City's efforts are effective and (3) recommendations and a plan for any needed enhancements or additions to the riparian buffer protection initiatives.	7/31/04

4.6 Wetlands Protection Program

Wetlands play a major role in watershed protection. From a drinking water perspective, critical functions include their ability to maintain good surface water quality in watercourses and reservoirs and to improve degraded water. Wetlands also moderate peak runoff, recharge groundwater and maintain baseflow in watershed streams. The City's 2001 Long-Term Watershed Protection Program includes a revision to its Wetlands Protection Strategy, first prepared in December 1996. The FAD requires the implementation of the revised Wetlands Protection Strategy (Section 6.4.6 and Appendix L of the City's Long-Term Watershed Protection Program) in accordance with the milestones therein, with the following clarifications/additions:

- Upon completion of Stream Management Plans pursuant to NYCDEP's Stream Management Program, NYCDEP shall identify which riparian areas, if any, covered by such Plans that it deems critical to the protection of water quality and shall provide funding and/or other resources to ensure long-term protection or enhancement to such areas; and

- NYCDEP shall consult with the U.S. Fish and Wildlife Service (USFWS) to determine whether there are wetland restoration projects in the watershed eligible for participation in USFWS's "Partners for Wildlife Program" which in the City's estimation will yield important water quality protection benefits. If NYCDEP determines that there are such projects, NYCDEP shall provide funding or other resources to assist in the implementation of such projects.

Milestone/Reporting Requirements

Requirement	Due Date
Submit a report on the findings of its monitoring program at reference wetlands by March 2004 and yearly thereafter, along with a discussion on how this information will be used to meet program goals.	annually (commencing in 2004)
Complete Wetland Characterization and Preliminary Assessment of Wetland Functions methodology (W-PAWF) for:	
• Cannonsville and Neversink basins	completed
• All other Catskill/Delaware basins, east- and west-of-Hudson	12/31/04
Wetland Mapping and Trend Analysis Projects	
• Contract for aerial overflight (WOH National Wetland Inventory [NWI] Update and EOH Trend Analysis)	
◦ Acquire aerial photography	5/31/03
◦ Photo processing and indexing	5/31/04
• Contract for WOH NWI Update	
◦ Produce draft maps	6/30/04
◦ NYCDEP field checks	11/30/04
◦ Finalize maps and GIS coverages	2/28/05
◦ Final report	4/30/05
• Contract for EOH Wetland Trend Analysis	
◦ Photo analysis and GIS mapping	5/31/05
◦ Final report	7/31/05

Report on implementation of the Wetlands Protection Program in accordance with the City's 2001 Wetlands Protection Strategy and the milestones therein and clarifications/additions, above. Strategy components to report on include: *Non-regulatory programs* Wetlands inventory and trends Wetlands science and research Acquisition Stream management Agricultural programs Wetlands partnerships Education *Regulatory programs* Project reviews NYSDEC map revisions Wetland tracking Regulatory violations	annually

4.7 East of Hudson Non-Point Source Pollution Control Program

NYCDEP is developing a comprehensive non-point source program for the West Branch, Boyd's Corner, Croton Falls and Cross River Reservoir basins. In the initial phase of this program, the City will begin implementation of the following program elements in these basins: agricultural program (including the small farms program), forestry program, and new septic and stormwater initiatives. The City will work with USDA to implement the Conservation Reserve Enhancement Program east-of-Hudson. In the second phase of this program, the City will complete and implement a Croton Watershed Strategy that will provide for integrated watershed management to protect and improve water quality in the West Branch, Boyd's Corner, Croton Falls and Cross River Reservoir basins. In addition, NYCDEP will address many concerns in the east-of-Hudson watersheds through the aggressive implementation of the Watershed Rules and Regulations, increased involvement in project reviews and through a detailed analysis of impervious surfaces at the sub-basin scale. The City and Westchester and Putnam County officials shall continue to keep each other informed of planned and ongoing east-of-Hudson non-point source pollution control actions. As the Westchester and Putnam County Croton Plans are completed, it is expected that the counties will also play a substantial role in addressing non-point sources of pollution in the east-of-Hudson basins.

The City's 2001 Long-Term Watershed Protection Program includes a Non-Point Source Pollution Strategy for east-of-Hudson Catskill/Delaware basins and Cross River and Croton Falls basins (Section 6.4.7). The FAD requires full implementation of the Strategy, in accordance with the milestones therein and referenced in the Strategy, and the requirements below:

Milestone/Reporting Requirements for Catskill/Delaware Basins east-of-Hudson and Cross River and Croton Falls

Requirement	Due Date
Report on: • Implementation of east-of-Hudson forestry and agricultural programs, and the development-implementation status of CREP for the Croton System. • Implementation of a septic program in West Branch and Boyd's Corner basins in accordance with December 2001 Septic Strategy and schedule. (Include a report on septic systems identified as inadequate and actions taken to affect repairs). • Coordination with Westchester and Putnam County to connect failed or failing septics to existing sewers in such identified areas pursuant to local and state sanitary laws. • Progress made in coordinating septic repairs in Putnam County. • stormwater projects in accordance with Non-Point Source Strategy and schedule. • Development/implementation of a program to address small, localized areas of stormwater-related problems in Catskill/Delaware basins east-of-	semi-annually

Hudson (including Cross River and Croton Falls) in accordance with the Non-Point Source Strategy and schedule.	
Complete and submit impervious surfaces report. Also provide to applicable counties and municipalities.	12/31/02
Complete and submit Croton Integrated Watershed Strategy, including basin reports.	3/31/03
Submit Conceptual East-of-Hudson Non-Point Source Management Plan and Schedule.	6/30/03
Submit Final East-of-Hudson Non-Point Source Management Plan and Schedule. (Upon acceptance by EPA, in consultation with NYSDOH and NYSDEC, the Schedule milestones will become a FAD requirement.)	10/31/03
Report on Implementation of Plan in accordance with Schedule. Also report on efforts to coordinate planning and implementation of actions under the City's East-of-Hudson Non-Point Source Management Plan and the Counties' Croton Plans.	semi-annually (commencing in 2003)

4.8 Kensico Water Quality Control Program

The Kensico Reservoir, located in Westchester County, is the terminal reservoir for the City's Catskill/Delaware water supply system. Because it provides the last impoundment of Catskill/Delaware water, prior to entering the City's distribution system, protection of this reservoir is of critical importance. Recognizing the importance that the Kensico Reservoir plays in maintaining filtration avoidance for the City, the 1997 FAD established a multi-faceted program to protect its watershed and improve the water quality of this reservoir. Implementation by the NYCDEP of these key program elements has resulted in reduced risk of turbidity and fecal coliform bacteria contamination of the City's drinking water. NYCDEP's 2001 Long Term Watershed Protection Program includes the Kensico Water Quality Control Program (Section 6.4.8). This program provides a long-term commitment by NYCDEP to continue key elements of the existing Kensico Management Plan and identifies new measures to enhance the protection and water quality of the Kensico Reservoir.

EPA's FAD requires that NYCDEP implement its Kensico Water Quality Control Program (Section 6.4.8 of the City's Long-Term Watershed Protection Program) in accordance with the milestones contained therein, with the following modification:

- The City will complete a sewer inspection operation and maintenance protocol by 9/30/02 and a video inspection of stormwater infrastructure by 12/31/02

Milestone/Reporting Requirements

Requirement	Due Date
Kensico Water Quality Control Program milestones include:	
• Complete installation of structural stormwater BMPs 58, 59, 74 and 75	12/31/02
• Replace and maintain the turbidity curtain at Malcolm Brook	9/30/02
• Install spill containment facilities for Interstate 684	9/30/02
• Follow criteria to determine the need for sediment dredging at Shaft 18 and Catskill Upper Effluent Chamber	continuous
• Complete house-to-house septic system survey	9/30/02
• Initiate additional house-to-house septic system survey	12/31/06
• Complete video inspection of stormwater infrastructure in sewered areas	12/31/02
• Initiate action to ensure disconnection of any illicit sewer connections discovered by video inspection of stormwater infrastructure	4/30/03
• Pursue expansion of KWIC membership and participate in annual meetings	continuous
• develop inventory of appropriate facilities and meet with municipal supervisors	completed
• Implement the Kensico Spill Containment Plan for Nanny Hagen Road and Routes 120 and 22	
• complete design	9/30/02
• complete construction	10/31/04
• Complete basin-wide stormwater infrastructure mapping, including recommendations for further action and a timetable for such action	12/31/02
• Work with Westchester County to complete a sewer system operations,	9/30/02

inspection and maintenance protocol	
Reporting: • Submit an integrated Kensico Watershed Management Report. This Report will discuss progress in implementing all program elements, including an identification of septic systems identified as inadequate and schedule for repair or replacement. • In addition to what is included in the semi-annual report, the Kensico Watershed Management Report will include presentation, discussion and analysis of monitoring data (e.g. keypoint, reservoir, stream, BMPs, Westchester County Airport groundwater wells) as well as the status and application of the Kensico reservoir model.	semi-annually annually

4.9 Catskill Turbidity Control

The City's Long-Term Watershed Protection Program includes a Catskill Turbidity Control program (Section 6.4.9) to address elevated turbidity in Catskill watershed.

The FAD requires the City to implement the Catskill Turbidity Control Program as detailed in Section 6.4.9 of the City's Long-Term Watershed Protection Program and in accordance with the modified milestone schedule below. The City will also augment its stream management program by implementing additional projects that may reduce turbidity. For example, in addition to the specific stream restoration projects identified in the milestone table of Section 4.5 of the FAD, the City will also identify two restoration projects in Schoharie Reservoir Basin and one restoration project in either the Schoharie or Ashokan Reservoir basin and complete these 3 projects no later than 12/06.

Milestone/Reporting Requirements

Requirement	Due Date
Submit NYCDEP contractor's Preliminary Assessment Report on Catskill turbidity controls.	completed
Conduct an assessment of the feasibility of installing a turbidity curtain or other interim BMP to reduce turbidity levels entering Esopus Creek. If the assessment determines that there are feasible, cost-effective BMP(s), NYCDEP will submit a schedule for implementation and, upon approval of the schedule by EPA/NYSDOH, will implement such BMP(s).	completed
Complete dredging of the Schoharie Reservoir intake channel	12/31/05
Conduct a comprehensive analysis of engineering and structural alternatives at the Schoharie Reservoir that may reduce turbidity levels entering Esopus Creek. The study will be implemented in accordance with the following schedule:	
• Develop and submit scope of work.	completed
• Develop contract, select consultant and begin work.	10/30/03
• Submit report on phase I of study. Phase I includes (1) a preliminary screening assessment of all alternatives and (2) a comprehensive turbidity curtain study, including an in-reservoir pilot.	12/31/04
• Develop a plan, subject to EPA, NYSDOH, and NYSDEC approval, with appropriate milestones for implementing a turbidity curtain as an early action if determined to be feasible and cost effective.	3/31/05
• Submit final report upon completion of phase II of study. Phase II will incorporate the results of a fully calibrated and verified reservoir model. The report will include preliminary designs and detailed cost information for final decision-making purposes.	9/30/06
• Develop a plan, subject to EPA, NYSDOH and NYSDEC approval, with appropriate milestones for implementing any feasible, cost effective measures identified by the comprehensive engineering analysis.	12/31/06

Work with NYSDEC to develop a sediment transport model for the Schoharie and Esopus basins. This model is intended to provide a technical basis for future TMDL decisions in these basins.	12/31/03
Work with NYSDEC to develop a release management strategy, along with an implementation schedule, for water from Schoharie Reservoir to Esopus Creek and the Ashokan Reservoir. If the regime cannot be completed by the milestone date, NYCDEP will provide EPA with a discussion as to what was and what was not agreed upon, with a detailed explanation of issues of disagreement. (EPA expects NYSDEC to submit similar information.)	5/31/03
Submit a report identifying sources of turbidity in the Schoharie basin, analyze their relative impacts on water quality in the Schoharie basin, and identify whether (and how) they are specifically being addressed through the City's 2001 Long-Term Watershed Protection Program.	7/31/03
Develop a plan and schedule for the implementation of specific projects or activities, that are feasible and cost-effective, and not currently being addressed through the City's 2001 Long-Term Watershed Protection Plan, for the purpose of controlling/remediating sources of turbidity in the Schoharie basin. In developing the plan, NYCDEP will take into consideration any actions taken to meet TMDLs in the basin.	1/31/04
Expand the water quality telemetry system for the Schoharie Reservoir and Shandaken tunnel	1/31/04
Provide technical support to NYSDEC in NYSDEC's development of a suspended sediment TMDL for the Schoharie and Esopus basins.	continuous
Reporting: Report on the implementation of all elements of the Catskill Turbidity Control Program	annually
Convene meeting every six months with EPA, NYSDOH and NYSDEC to review progress on all Catskill turbidity control efforts, including but not limited to the City's analysis of engineering alternatives for the Schoharie Reservoir as well as report on the status of source control initiatives.	semi-annually (September and March)

5. Watershed Monitoring, Modeling and GIS

5.1 Watershed Monitoring Program

NYCDEP conducts extensive monitoring throughout the watershed. The program was most recently described in detail in the November 1997 report, "Water Quality Surveillance Monitoring Program." The monitoring program in the watershed must be designed to meet multiple objectives, which fall into four key areas:

- Compliance Monitoring
- Surveillance Monitoring
- Research Support
- Modeling Support

As watershed protection programs have developed and analytical techniques for key parameters have changed, it has become necessary to reassess the monitoring program to ensure that it can continue to be used to support NYCDEP's watershed management program and can be used to evaluate the effectiveness of programs established under the FAD and MOA. NYCDEP reviewed the four major program elements of the monitoring program: hydrology, limnology, integrated modeling and pathogens and, based on this review, submitted its revised monitoring program plan to EPA and NYSDOH in April 2002. NYCDEP will address comments provided by EPA and NYSDOH and resubmit the document by September 30, 2002.

NYCDEP's Long-Term Watershed Protection Program includes a Watershed Monitoring Program (Section 6.5.1) which provides details of the monitoring program's objectives, the program review, and program milestones. The FAD requires that NYCDEP conduct a watershed-wide monitoring program in accordance with Section 6.5.1 of its Long-Term Watershed Protection Program and the milestones therein. The monitoring program will be conducted in accordance with the revised Hydrology Program, Limnology Program, Integrated Modeling Program and Pathogen Program plan to be finalized by September 30, 2002. Additionally, NYCDEP will conduct data analysis, make data available to watershed stakeholders and utilize the data to conduct periodic assessments of the effectiveness of the watershed protection programs - - as detailed in the City's Watershed Monitoring Program.

NYCDEP recognizes the need for regular evaluation and appropriate revision and refinement of its watershed protection program. The watershed protection program includes, but is not limited to, remedial activities, protection activities, land acquisition and the Watershed Rules and Regulations. NYCDEP has committed to undertaking a comprehensive evaluation of the program on a periodic basis, with the first scheduled for March 31, 2006. The data generated through this monitoring program in conjunction with other defensible scientific findings is to be used to conduct the City's periodic assessment of the effectiveness of the watershed protection program.

Milestone/Reporting Requirements

Requirement	Due Date
Submit revised Watershed Monitoring Program Plan	9/30/02

Submit Quality Assurance Plans for Pathogen Program special research projects.	3 months prior to commencement of research projects
Submit Water Quality Indicator Report in accordance with Section 6.5.1, Attachment E of the Long-Term Watershed Protection Program. Post on NYCDEP website.	annually (July 31)
Submit Research Objectives Report. This report will provide the status of various research programs addressing the sources, fate, and transport of key constituents, and the status of the evaluation of data generated by other agencies. This report will also address research on watershed processes affecting water quality such as key modeling programs. It will also identify special research projects that will be conducted during the following year and will assess need for conducting a watershed monitoring seminar to disseminate data in the upcoming year and, as appropriate, identify a target date. Post on NYCDEP website.	annually (commencing 5/15/03)
Submit draft outline for Comprehensive Water Quality/Program Evaluation Report. The outline should include a section for NYCDEP modifications (enacted and planned) to the Watershed Rules and Regulations. Submit Comprehensive Water Quality/Program Evaluation Report in accordance with outline to be approved by EPA. Post on NYCDEP website.	9/30/04 every five years (commencing 3/31/06)
Submit periodic monitoring reports and after action reports on specific monitoring projects, chemical treatments, etc.	upon completion
Conduct periodic seminars on watershed monitoring.	as identified in Research Objectives Report.
Conduct special studies.	as identified in Research Objectives Report.
Evaluate monitoring data and research conducted in the watershed by other agencies.	continuous
Report on the long-term monitoring of wastewater treatment plants for *Giardia* cysts and *Cryptosporidium* oocysts. This monitoring program also includes collecting operational information for facilities that use micro-filtration and facilities that use approved equivalent methods for protozoan pathogen reductions.	annually

5.2 Multi-Tiered Water Quality Modeling Program

NYCDEP has developed a Multi-Tiered Water Quality Modeling Program which consists of integrated reservoir and terrestrial models. These models are used to support long-term watershed management and short-term operational strategies. Existing program elements are the Nutrient Management Eutrophication Modeling System, two-dimensional reservoir models and research related to modeling pathogens and particles. The 1997 FAD required that the reservoir and terrestrial models be developed, calibrated and verified for each Catskill/Delaware watershed.

The City's 2001 Long-Term Watershed Monitoring Program includes a Multi-Tiered Water Quality Modeling Program (Section 6.5.2). The FAD requires that NYCDEP implement its Multi-Tiered Water Quality Modeling Program in accordance with Section 6.5.2 and Appendix M of the City's 2002 Long-Term Watershed Monitoring Program and the milestone dates therein. In addition, the City will implement TMDL-related modeling activities as specified below.

Milestone/Reporting Requirements

Requirement	Due Date
Conduct monitoring needs assessment to support terrestrial and reservoir modeling.	complete
Provide for further calibration and verification of GWLF models: • Pepacton, Ashokan, West Branch • Neversink, Rondout, Schoharie	 1/31/06 1/31/07
Report on progress of milestone activities #1 through #6 in Section 6.5.2 and Appendix M of the Long-Term Plan, including: • the expansion of Nutrient Management Eutrophication Modeling System capabilities to Rondout, Neversink, Pepacton, Ashokan, Schoharie and West Branch reservoirs, • results of model applications to guide management and operational decisions, • utilization of multi-tiered water quality models to assess adequacy of TMDLs • technical support provided to NYSDEC to develop a modified TMDL (as appropriate)	semi-annually (January and July)
Complete expansion of Nutrient Management Eutrophication Modeling System capabilities for: • Pepacton, Ashokan, West Branch • Neversink, Rondout, Schoharie	 7/31/06 7/31/07
Incorporate a mechanistic submodel for THM precursors into the existing Cannonsville eutrophication framework.	12/31/02
Incorporate a mechanistic submodel into the Cannonsville eutrophication model to accommodate the effects of resuspension on water quality.	6/30/03

Incorporate PAR modeling integration tools into NYCDEP's Nutrient Management Eutrophication Modeling System.	six months after receipt of software from PAR SDWA contract.
Develop and refine integration of one- and two-dimensional Catskill/Delaware reservoir models into a multiple reservoir modeling system.	six months after completion of PAR SDWA contract work.
Integrate/link the Kensico Reservoir model into the existing Catskill/Delaware models	six months after completion of PAR SDWA contract work.
Implement the following TMDL-related modeling activities:	
Provide schedule for (1) utilizing multi-tiered water quality models to assess the implications of Phase II TMDLs for watershed management purposes at a finer spatial and temporal scale, and (2) recommending TMDL changes, if any, to NYSDEC. Evaluate and report on the assessment to EPA for Cannonsville first, followed by Pepacton, then the other Catskill/Delaware reservoirs.	9/30/02
Provide technical support and make appropriate recommendations to assist NYSDEC in its development and adoption of revised nutrient criteria for Catskill/Delaware reservoirs. Provide EPA with NYCDEP's recommendations to NYSDEC and report on NYCDEP's effort to support NYSDEC. Continue to report on efforts semi-annually.	semi-annually (commencing 12/31/04)
Assess the need for new TMDLs, in the appropriate basin, if the nutrient criteria are modified (per bullet #2 above), and recommend TMDL changes, if any to NYSDEC.	6 months after a new standard or guidance value modification

5.3 Geographic Information System

NYCDEP maintains an extensive Geographic Information System (GIS) which is designed for watershed management applications and remote sensing. The GIS's capability to manipulate spatial databases is used to support existing program objectives and terrestrial and reservoir modeling. The GIS staff produce maps, provide training in Geographic Positioning System (GPS) data gathering and provide satellite imagery analysis. During the 1997 FAD, NYCDEP progressed in the areas of database development, equipment upgrades, staff training and utilization of its GIS capabilities.

The City's 2001 Long-Term Watershed Protection Program includes a GIS component (Section 6.5.3). The FAD requires that NYCDEP continue to upgrade and utilize its GIS capabilities and fully implement the Geographic Information System component (Section 6.5.3) of its 2001 Long-Term Watershed Protection Program in accordance with the milestones therein.

Reporting Requirements

Requirement	Due Date
Report on : • Progress in utilizing GIS for watershed management applications • Completion of new data layers • Incorporation of data layers into the modeling database • Data dissemination to stakeholders and the public, including notification of data availability to communities and requests for data • Availability of GIS data through the Internet • GIS Infrastructure Improvement	semi-annually

6. Regulatory Programs

6.1 Watershed Rules and Regulations and Other Enforcement/Project Review

The New York City Watershed MOA resulted in revised Watershed Rules and Regulations (WR&Rs) being adopted in January 1997. The 1997 FAD required NYCDEP to implement these regulations. The City's 2001 Long-Term Watershed Protection Program includes a number of commitments that should increase the effectiveness of the City's implementation and enforcement of the WR&Rs and of its participation in the SEQRA process. The FAD requires NYCDEP, with the assistance of NYSDOH and NYSDEC, to administer the City's WR&Rs and other enforcement/project review commitments as specified in Chapter 6.6.1 of NYCDEP's 2001 Long-Term Watershed Protection Program in accordance with the milestones therein.

The Program also includes the following clarification/additions:

- In order to ensure the most thorough project review, NYCDEP will encourage applicants to attend pre-application conferences on proposed stormwater pollution prevention plans (SPPPs) and to submit SPPP designs at the earliest possible time in the project timetable. NYCDEP will report on these efforts annually.

- Program commitment #17 is modified to state that "NYCDEP will continue to work with New York State DOT, in consultation with NYSDEC, on a pilot program that encourages the efficient use of appropriate winter highway de-icing materials in the watershed." NYCDEP will report on this program annually.

- NYCDEP will report to EPA by January 31, 2004 on any enacted or planned modifications to the City's Watershed Rules and Regulations. The report will also include a timeline for enacting any planned modifications.

Milestone/Reporting Requirements

Requirement	Due Date
NYCDEP will report annually on the progress in implementing program commitments #1 through #10, #17 (all detailed in section 6.6.1 of the City's Long-Term Watershed Protection Program) and the clarifications/additions, above, in the time periods specified by each requirement. The report will also include an assessment of the implementation of the above program commitments, along with suggested changes or enhancements. Program commitments #1 through #10 contain the following specific milestone deadlines:	
• Amend WR&Rs to prohibit new galleys as subsurface treatment systems in the watershed.	completed

• Develop internal NYCDEP guidance for effective participation in the SEQRA process. Provide an updated overview of the scope of NYCDEP's involvement in SEQRA and a description of the roles and responsibilities of City staff in the SEQRA review process. • Complete mapping and analysis of impervious surfaces in east-of-Hudson Catskill/Delaware basins (including Cross River and Croton Falls) at the sub-basin level and submit information to EPA, the State, and applicable counties and municipalities. • Review and make appropriate revisions to SPPP guidance to (1) reflect BMP monitoring data, (2) refine BMP assumptions, (3) create performance-based benchmarks, (4) highlight the importance of non-structural BMPs and buffers, and (5) promote innovative site design to meet SPPP requirements.	12/31/02 12/31/02 6/30/04

• Develop and implement a two-year pilot Stormwater Enforcement Coordination Pilot Program. Formalize an agreement with the chosen municipality for the coordination of enforcement actions.
  • Evaluate and report on the Stormwater Enforcement Coordination Pilot Program.
  • Report on expanding the Stormwater Enforcement Coordination Pilot Program.
	9/30/02
	annually
	6/30/04

NYCDEP will work with NYSDEC to develop an addendum to existing MOU to improve coordination of stormwater enforcement actions between agencies and with the State Attorney General's office. Provide interim report on efforts to improve coordination, with examples.	12/31/02
Continue to take timely and appropriate enforcement action against WWTP non-compliance with the WR&Rs and SPDES discharge permit requirements in accordance with the WECC enforcement coordination protocol of the NYSDEC/NYCDEP MOU. NYCDEP will assist in the training of small facility operators.	continuous - report quarterly through WECC process.
Report on phosphorus-restricted and coliform-restricted analyses.	annually - July (in Water Quality Report)
Substantially implement, in consultation with NYSDOH, the recommendations made in the Septic Siting Study, through a guidance document or other effective mechanism.	9/30/02
Develop draft methodology for evaluating Pilot Offset Program and submit to EPA, State and watershed stakeholders.	submitted

Review and revise Applicant Guides under the WR&Rs. The reviews will at a minimum include the following guides: WWTPs, SSTS, SPPP, IRSPs, CPDPs and Variances. The SSTS guide revisions will reflect NYCDEP's recommendations based on the Septic Siting Study. The SPPP guide revisions will discuss nonstructural best management practices and innovative site design.	9/30/02
Report on project review activities with respect to ongoing and proposed projects that may affect water quality, including variance activities and the review of new/remediated septic systems in the Cat/Del watershed basins and Croton Falls and Cross River basins. The report should include a summary table (inventory) of all development projects proposed and their SEQRA status and projects under construction, by basin, with corresponding maps. An up-to-date summary table with corresponding maps will also be made available on NYCDEP's website.	quarterly
Report on the status of NYCDEP regulatory enforcement actions in the Cat/Del watershed basins and Croton Falls and Cross River basins.	quarterly
NYCDEP will report to EPA on any enacted or planned modifications to the City's Watershed Rules and Regulations. The report will also include a timeline for enacting any planned modifications.	1/31/04

6.2 WWTP Inspection Program

The WWTP Inspection Program constitutes the onsite inspection, sample monitoring, compliance assistance, and enforcement of State Pollutant Discharge Elimination System (SPDES) permits of all WWTPs discharging in the New York City watershed. The program is coordinated through an EPA-approved Memorandum of Understanding (MOU) between NYSDEC and NYCDEP. The MOU established the Watershed Enforcement Coordination Committee (WECC), which meets quarterly to address non-compliance through formal enforcement and/or compliance assistance under specific inter-agency protocols. The WECC process is designed to address instances of significant non-compliance in a timely and appropriate manner.

The FAD requires that NYCDEP, with the assistance of NYSDEC, administer the City's WWTP Inspection Program as outlined in Chapter 6.6.2 of its Long-Term Watershed Protection Program in accordance with the following requirements and associated milestones.

Milestone/Reporting Requirements

Requirement	Due Date
Perform sample monitoring at all New York City-owned WWTPs in accordance with their SPDES permits and grab sample monitoring twice per month at all non-New York City-owned WWTPs discharging in the Catskill/Delaware Watershed . At least once annually, samples shall be collected and analyzed in accordance with the monitoring requirements of the SPDES permit. If deemed beneficial for enforcement purposes, samples shall be collected and analyzed more frequently, including weekend sampling and split sampling with the facility when possible, in accordance with the monitoring requirements of the SPDES permit. Submit results to EPA and NYSDEC.	quarterly
Conduct at least four on-site inspections for year-round SPDES permitted facilities and at least two on-site inspections for seasonal SPDES permitted facilities per year at all WWTPs in the watershed. • Submit summary reports • Submit all sample monitoring data and inspection reports	 quarterly annually (January)
Continue implementation of the NYSDEC/NYCDEP MOU and the WECC meetings to ensure timely and appropriate enforcement and compliance assistance for each WWTP.	quarterly
Prepare and submit a document that summarizes the "lessons learned" from the operation of microfiltration units at City-owned WWTPs. Circulate the document to the operators of non-City-owned WWTPs that will be installing microfiltration, prior to start up of microfiltration units at those facilities.	completed

Report on activities of NYCDEP's Technical Support Plan (Circuit Rider) to assist WWTP owners in the training, certification, and proper operation and maintenance of their facilities.	semi-annually

7. Catskill/Delaware Filtration/UV Disinfection Facilities

The 1997 FAD required NYCDEP to proceed with the design of filtration facilities for the Catskill/Delaware system, thereby minimizing the overall time to commence filtration in the event EPA later determined that filtration was necessary. Under the 1997 FAD, NYCDEP completed a final preliminary design for filtration facilities and prepared a preliminary draft Environmental Impact Statement. As allowed by the 1997 FAD, on November 29, 2001, EPA granted NYCDEP conditional relief from completing further design deliverables for the filtration planning process.

Section 6.7 (Catskill/Delaware Filtration/UV Disinfection Facilities) of the City's 2001 Long- Term Watershed Protection Program includes two of the conditions for relief. One is a commitment by the City to a schedule for the feasibility study and design/construction of UV disinfection facilities for the Catskill/Delaware water supply system. Another condition of relief is that NYCDEP produce updates to the preliminary design for a Catskill/Delaware filtration plant every two years so that the preliminary design, completed in December 2001, does not become obsolete.

The FAD requires implementation of the Catskill/Delaware Filtration/UV Disinfection Facilities program in accordance with Section 6.7 of the City's 2001 Long-Term Watershed Protection Program and in accordance with the milestones therein. Meeting these milestone deadlines continues to be a condition of relief from the 1997 FAD filtration plant design requirements.

Milestone/Reporting Requirements

Requirement	Due Date
Catskill/Delaware Filtration milestones include: •NYCDEP will issue a Catskill/Delaware Filtration Facilities Update Report. The report will discuss analysis and redesign work performed, and include the issuance of necessary changed pages to the Final Preliminary Design Report and Drawings.	biennially (commencing 9/30/03)
UV Disinfection Facilities milestones include:	
•Complete and Submit Conceptual Design	completed
•Commence Final Design	completed
•Draft Environmental Impact Statement	5/31/04
•Final Environmental Impact Statement	11/30/04
•Complete and Submit Final Design	5/31/05
•Commence UV Operation	8/31/09

8. In-City Programs

8.1 Waterborne Disease Risk Assessment Program

The overall objective of the Disease Surveillance Program is to track the incidence of and gather relevant epidemiological data on two waterborne diseases: giardiasis and cryptosporidiosis. Central goals of the City's Disease Surveillance Program include tracking the incidence of disease, and developing and maintaining a system to detect disease outbreaks of possible waterborne transmission. It is important to understand the endemic rates for giardiasis and cryptosporidiosis and any possible association between these diseases and the New York City water supply so that appropriate steps may be taken by health care professionals and water supply consumers. Early detection of a waterborne disease outbreak may prevent disease from occurring on a widespread basis, and it may help limit the spread of the disease before it reaches epidemic proportions.

As a condition of filtration avoidance, in accordance with the SWTR, a public utility must demonstrate that it has not been the source of a waterborne disease outbreak. The 1997 FAD required NYCDEP to maintain a system to detect the presence of waterborne disease outbreaks and to report any evidence of such an outbreak. Since 1997, the program has developed to include new elements which enhance system surveillance and data collection.

NYCDEP's 2001 Long-Term Watershed Protection Program includes a Waterborne Disease Risk Assessment Program (Section 6.8.1). The FAD requires that NYCDEP implement the Waterborne Disease Risk Assessment Program in accordance with Section 6.8.1 of the City's Long-Term Watershed Protection Program and the milestones contained therein.

Milestone/Reporting Requirements

Requirement	Due Date
Conduct a review of epidemiological studies analyzing the relationship of tap water to gastro-intestinal illness for the purpose of determining the feasibility of the City conducting its own epidemiological study (with implementation timeline).	completed
Prepare and submit annual report on program implementation, findings and analysis	annually (May 31)
Prepare and submit semi-annual reports on program implementation and findings	semi-annually
Implement "Cryptosporidium Action Plan"	continuous

8.2 Cross Connection Control Program

Cross connections in a drinking water distribution system are a potential source of contamination. Cross connections can be caused by improper or direct connections, excessive back pressure on the system, back siphonage, and other reasons. It is important to eliminate any areas where such conditions exist in order to eliminate the possibility for cross connection contamination. The 1997 FAD required the submittal of an annual report summarizing cross connection activities. NYCDEP's 2001 Long-Term Watershed Protection Program contains a revised Cross Connection Control Program (Section 6.8.2).

The FAD requires that NYCDEP implement the Cross Connection Control Program as detailed in Section 6.8.2 of the City's Long-Term Watershed Protection Program and in accordance with the milestones contained therein.

Reporting Requirement

Requirement	Due Date
Reporting: The City will report on its implementation of its Cross Connection Control Program and on its progress in meeting all associated milestones	semi-annually

9. Administration

The FAD requires NYCDEP to maintain the level of staffing, funding and expertise necessary to support all elements of the City's Long-Term Watershed Protection Program and all requirements under this determination, in accordance with the milestones contained or referenced therein. The City's Long-Term Watershed Program, Section 6.9 and Appendix A refers to a current headcount of 912 "filtration avoidance positions."

Reporting Requirements

Requirement	Due Date
Identify actual filled staff positions levels vs. available positions (912 as referenced in Appendix A of the Long-Term Watershed Protection Program) for each division and section involved in supporting the watershed protection program, and confirm that resource levels are adequate to ensure that all program goals/FAD requirements are met. Contractor support staff should be noted. If resources are not currently adequate, discuss the status of actions taken to bring more staff on board, and any remedial measures taken, to ensure that all program goals/FAD requirements are met.	annually
Provide written notification as to whether the City budget for the upcoming fiscal year includes sufficient funding to allow the City to meet its obligations under this determination. Also include in the notification the amount (capital and expense) spent during the previous year and the amount appropriated for watershed protection programs for the following year and planned for the year thereafter. The amount spent, appropriated and planned should be broken down by program, to the extent practicable. The notification should also include costs for technical consultant contracts identified in the FAD.	annually - within 30 days after the start of each City fiscal year
NYCDEP, in consultation with the New York City Office of Management and Budget, will make a presentation to EPA on the amount of money appropriated for watershed protection programs and its adequacy to meet program objectives and FAD requirements.	annually - within 30 days after the start of each City fiscal year

10. Education and Outreach

The objective of the City's Education and Outreach Program is to assist and advance watershed protection through substantial stakeholder involvement. In order for the City's watershed protection program to be successful, it must be understood, accepted and ultimately embraced by those who live in the watershed "upstate" and those who drink its water "downstate," as both are vital stakeholders. EPA believes that a strong base of knowledge of watershed issues and increased environmental awareness among stakeholders can facilitate conflict resolution and enhance the chances of program success. The City's 2001 Long-Term Watershed Protection Program includes a Education and Outreach component (Section 6.10 and Appendix N). The FAD requires that NYCDEP implement education and outreach activities in accordance with Section 6.10 and Appendix N (Education and Outreach Program) of the City's 2001 Long- Term Watershed Protection Program and the milestones therein.

The Program also includes the following clarification/additions:

- Consistent with the commitments in the City's Long-Term Watershed Protection Program, NYCDEP will continue to improve its website by completing development of an area which will allow the public to learn more about the activities and status of the projects and initiatives under the City's watershed protection program. The City will work with partner organizations to provide updates, public meeting announcements and other public information.

Milestone/Reporting Requirements

Requirement	Due Date
Consistent with the commitments in the City's Long-Term Watershed Protection Program, NYCDEP will continue to improve its website by completing development of an area which will allow the public to learn more about the activities and status of the projects and initiatives under the City's watershed protection program. The City will work with partner organizations to provide updates, public meeting announcements and other public information.	6/30/03
Report on implementation of the Education and Outreach Program in accordance with Section 6.10 and Appendix N of the 2001 Long-Term Watershed Protection Program and the milestones therein. Program components to report on include: *Program Specific Education Efforts:* • WAP/Forestry • Stream management • CWC • Croton planning • KEEP/KWIC *School-Based Education Efforts* *General Outreach* • East-of-Hudson lawn care programs • Household hazardous waste	annually

• Fairs, exhibits and local events *Publications* *Web-site* *Interactive CD updates* *Regulatory outreach* *New Initiatives* • Watershed protection progress newsletter • Sharing/dissemination of water quality data • New publications/press releases/advisories • Pesticide/Fertilizer working group follow-up • Coordinated outreach • Golf course management project • Lake management initiative	

11. Reporting

The City's 2001 Long-Term Watershed Protection Program includes a section on reporting (Section 6.11) which consists of a schedule for providing EPA periodic reports on the many elements of its program. The expected content for these reports is described in more detail in each section of this FAD and in the City's Long-Term Watershed Protection Plan.

For informational purposes, the City will inform EPA, NYSDOH and NYSDEC annually about actions planned and actions taken by the City on water conservation, implementation or revisions to the City's Drought Management Plan, and the elimination of leaks in the Delaware Aqueduct.

In addition to meeting all program/project milestones in accordance with the FAD, the FAD requires that the City provide EPA periodic program reports in accordance with the following *modified* report list and schedule:

Req. #	Report Topic	Frequency*
2	Objective Criteria Compliance	Monthly (quarterly for disinfection byproduct results)
3.1	Septic Programs Septic rehab/replacement Septic maintenance Sewer extension	Semi-annually
3.2	New Infrastructure Program	Semi-annually and quarterly spreadsheet/milestone report
3.3	Community Wastewater Management Program	Semi-annually and quarterly spreadsheet/milestone report
3.4	WWTP Upgrades	Monthly spreadsheet and quarterly spreadsheet/milestone report
3.5	Stormwater Control Programs	Annually
4.1	Waterfowl Program	Annually (July 31)
4.2	Land Acquisition Program Status	Quarterly
4.2a	Land Acquisition - monetary review	Biennially (commencing 1/31/04)

Req. #	Report Topic	Frequency*
4.3	Watershed Agricultural Program (WAP) Status	Semi-annually
4.3a	WAP evaluation	Biennially (February, even years)
4.3b	WAP Implementation Plan	Annually (January 31)
4.3c	WAP Research	Annually (October 31)
4.4	Forestry Program	Semi-annually
4.4a	Forestry Program - Comprehensive assessment	Annually (January 31)
4.5a	Stream Management Program	Semi-annually
4.5b	Stream Management - Comprehensive assess.	Biennially (commencing 4/30/04)
4.5c	Stream Management - Project List update	Semi-annually
4.6	Wetlands Program Status	Annually
4.7	Non-point Source Pollution Strategy for East-of-Hudson Catskill/Delaware Basins	Semi-annually
4.8	Kensico Watershed Management Report (including comprehensive data analysis in Jan.)	Semi-annually
4.9	Catskill Turbidity Control Program	Annually
5.1a	Water Quality Indicators Report	Annually (July 31)
5.1b	NYCDEP Scientific Research Program	Annually (commencing 5/15/03)
5.1c	Pathogen Program Status (including WWTP crypto study in January)	Semi-annually
5.1d	Comprehensive Water Quality/Program Evaluation Report	Every 5 years (3/31/06)
5.2	Water Quality Modeling Status	Semi-annually
5.3	GIS Status	Semi-annually

Req. #	Report Topic	Frequency*
6.1a	WR&Rs/SEQRA Implementation Status	Annually
6.1b	WR&Rs Project Review Report	Quarterly
6.1c	WR&Rs Enforcement Report	Quarterly
6.1d	Phosphorus Offset Program	Semi-annually
6.2a	WWTP Inspection Program Status Summary Comprehensive Report with all data and inspection reports	Quarterly Annually (January)
6.2b	Technical Support Plan	Semi-annually
7a	Catskill/Delaware Filtration Design Update	Biennially (commencing 9/30/03)
7b	UV Disinfection Facility Status	Semi-annually
8.1	Waterborne Disease Surveillance Program (with Comprehensive Report in May)	Semi-annually
8.2	Cross-Connection Control Program	Semi-annually
9a	Administration Report	Annually (July 31)
9b	Administration budget notification/presentation	Annually (July 31)
10	Education and Outreach	Annually
11a	Comprehensive FAD Annual Report	Annually (except 2006)
11b	NYCDEP Response to EPA On-site Inspection Report	Annually (within 60 days of EPA's report)

* Annually means submittal of reports for the previous calendar year due no later than March 31, unless otherwise stated in the FAD.

Semi-annually means submittal of reports for the six month period ending the last day of the month prior to the due date, due no later than January 31 and July 31, unless otherwise stated in the FAD.

Quarterly means submittal of reports for the three month period ending the last day of the month prior to the due date, due no later than April 30, July 31, October 31 and January 31.

Monthly means submittal of reports for the preceding month, due no later than ten days after the end of that month.