**New York City Department of Environmental Protection**

**Bureau of Water Supply**

# Expert Panel Review of the City's Watershed Protection Program Proposed Scope of Work

**September 2015**

*Prepared in accordance with Section 2.0 of the NYSDOH Revised 2007 Filtration Avoidance Determination*


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# Expert Panel Review of the City's Watershed Protection Program
# Proposed Scope of Work

## Introduction

During the public review period for the Revised 2007 FAD, the stakeholders agreed that it would be useful to review possible sources of risk to the City's Filtration Avoidance status and determine whether the City's FAD programs are effectively addressing those risks. New York State Department of Health (NYSDOH) agreed and the Revised 2007 Filtration Avoidance Determination (FAD) contains a requirement for the City to begin the contracting process for an independent, comprehensive review of the City's watershed protection plan. NYSDOH set the schedule so that the review, anticipated to take 3 years, will be complete in time to inform the mid-term review of the next FAD. This proposed scope of work is one of the first steps in this process.

It should be noted that this proposed scope of work will go through further reviews, including but not limited to City staff involved in contract oversight and legal staff associated with the contractor. Some minor changes in the text can be anticipated but the purpose and substantive scope of the project are not anticipated to change.

## Background

The City and NYSDOH plan to have the National Research Council (NRC) conduct the Expert Panel review of the City's watershed management program. NRC is in a unique position to bring together a group of experts with the breadth of experience and expertise needed to undertake this study and to ensure a comprehensive and scientifically objective product. Created by an act of Congress in 1863, the National Academy of Sciences (NAS) is a private, non-profit, national institution of distinguished scholars dedicated to promoting the effective utilization of scientific and technological resources of the country and to advancing the general interests of science. The NRC, established in 1916 by NAS, undertakes studies on the various technical and scientific questions presented for consideration by federal and other government agencies and nongovernmental institutions, or by mandates of Congress.

The NRC is also familiar with the City's water supply watershed. In the late 1990s, NRC conducted a review of the City's watershed protection strategy and made recommendations to improve that strategy. Specifically, a 15-member Expert Panel conducted a scientific evaluation of the watershed protection program as described in the 1997 NYC Watershed Memorandum of Agreement (MOA). The MOA memorializes the City's commitment to fund and implement a unique combination of watershed programs, policies and management practices. The first NRC Expert Panel's final report, entitled Watershed Management for Potable Water Supply: Assessing the New York City Strategy, was published in 2000. Overall the assessment found the City's program to be a "national model of watershed management and sustainable source water

protection" and the key to its success would be in its careful implementation.

Since the inception of the watershed protection program in the early 1990s and the signing of the MOA in 1997, much has changed. The individual watershed programs have matured, potential risks to the water supply have evolved, and the regulatory and political landscapes have changed. A new, independent and comprehensive review of the watershed program, nearly 20 years after the first NRC review, is therefore timely.

**Project Overview**

The goal of this project is to conduct an Expert Panel review of the adequacy of the City's watershed protection program and provide recommendations for program modifications, if needed. The focus of the review will be on compliance with the Surface Water Treatment Rule (SWTR) and filtration avoidance requirements, but the review will encompass all aspects of watershed protection, including cost effectiveness and operation of the water supply as it pertains to water quality protection and resiliency of the supply. The Expert Panel will be given wide latitude to determine what aspects of the water supply are pertinent to their review. Project duration is anticipated to be three years.

The final report will contain recommendations regarding the watershed protection program and the City's ability to sustain compliance with filtration avoidance criteria. The recommendations must incorporate the fact that the NYC watershed is not just a water supply source but a "living watershed" with tens of thousands of people residing, working and recreating within its boundaries. The watershed protection program is based on a spirit of mutual cooperation with our stakeholders which is reflected throughout the 1997 MOA:

> "*… drinking water protection and economic vitality within Watershed communities are not inconsistent and it is the intention of the Parties to enter into a new era of partnership to cooperate in the development and implementation of a Watershed protection program that maintains and enhances the quality of the New York City drinking water supply system and the economic vitality and social character of the Watershed communities*."
>
> 1997 MOA at 2

**Process**

<u>Scope Development</u>

On March 16, 2015, NYSDOH held a watershed stakeholder meeting to discuss the scope of this watershed protection program review. Written comments were also received from some parties. Based on the stakeholder comments, both verbal and written, the scope of the previous NRC review, and discussions with NYSDOH, DEP drafted this proposed scope of work.

Contracting

The City will obtain budget approval and proceed with the necessary steps to secure a contract with the NRC to conduct the Expert Panel review of the watershed protection program. In addition to the review of the watershed protection program, the contract scope will include necessary project management tasks, including but not limited to:

> *Contract management tasks* - tracking and reporting on project progress, ensuring the completion and submission of all deliverables, invoicing and financial reporting, and all other project management activities to ensure the project proceeds on-schedule and within budget.
>
> *Expert panel management tasks* - all actions necessary to constitute the Expert Panel, organize information for dissemination to the Expert Panel, arrange for and participate in meetings of the Expert Panel, facilitate travel arrangements for members of the Expert Panel, and assist in the preparation and production of all reports and deliverables.

Expert Panel Review

The NRC will select a group of experts to serve on an Expert Panel to evaluate the City's watershed protection program. Members of the Expert Panel, who are the primary authors of NRC reports, are selected expressly for their expertise in the relevant scientific issues at hand. In this case, the Expert Panel will include approximately 12 members and will include cutting-edge researchers and experts with extensive practical experience in the following areas: hydrology, watershed management, environmental engineering, ecology, microbiology, public health and epidemiology, urban planning, economics, and environmental law. The Expert Panel will be formed in the context of the NAS's normal concerns for conflict of interest and bias to assure a balanced and objective review. It will also reflect other objectives of achieving diversity in terms of age, gender, geographical distribution, and other factors. NAS will ensure that the selected experts are not directly connected to the New York City water supply and are free from any potential conflicts of interest. Experts will be vetted through NRC's procedures to ensure that any biases on the committee are balanced to assure a balanced and objective review.

Scientific objectivity and rigor are also ensured by the extensive independent, concurrent review process that will carried out by NRC staff. The purpose of this review is to assist the Expert Panel in making its report as accurate and effective as possible and to ensure that the Panel and the NAS are creditably represented by the report. This separate staff review distinguishes the NRC from many other organizations offering scientific and technical advice on important national issues.

NRC and the Expert Panel will gather information about the watershed protection program in multiple ways, including but not limited to: written materials, site visits and periodic meetings. The Expert Panel meetings will be used to receive briefings, gather information, deliberate on critical issues, and ultimately collaborate on drafting the report. The City, and potentially others, may be asked to make formal presentations and act as information resources to the Expert Panel. The meetings will also have time set aside for stakeholders to provide comments and other information to the panel. The final meeting will be held in closed session to allow the Expert Panel to finalize its draft report.

The final report will undergo standard NRC review procedures, including internal review by NRC staff and external review by NRC-selected reviewers with applicable expertise. The Expert Panel and NRC staff must satisfactorily respond to all comments from these internal and

external reviewers before the report is finalized. The names of these reviewers are included in the final report but the comments are confidential and not available to the public or the City. In addition, NRC shall, in accordance with its standard procedures, provide the City with a pre-publication copy of the report prior to its official release.

**Review Materials**

There are extensive materials on the many aspects of the watershed protection program: program as an integrated whole, individual programs, water quality (current and past), and operations of the water supply. The City will be guided by NRC on what information is needed as well as the timing and format of the transmittal. As a starting point, the City will provide the following:

MOA and FADs

- 1997 NYC Memorandum of Agreement
- current and previous FADs

Selected FAD Deliverables

- Watershed Protection Program Summary and Assessment (2016)
- Long-Term Watershed Protection Plan (2016)
- Watershed Water Quality Annual Report (2016)
- Waterborne Disease Risk Assessment Program Report (2016)
- NRC Expert Panel Review of Operation Support Tool (expected 2017)

Watershed Program Assessments

- NYSDOH Assessment of the City's FAD compliance (expected 2016)
- Watershed Management for Potable Water Supply (NRC 2000)
- Report of the Expert Panel on New York City's Water Supply (1993) (a.k.a., Blue Ribbon Panel Report) and DEP response (1993)

Watershed Program Rules and Policies

- CWC Septic Rehabilitation and Replacement program
- CWC Local Flood Hazard Mitigation Implementation Program
- DEP Land Acquisition and Flood Buy-Out Program

Operational Plans

- Cryptosporidium-Giardia Action Plan
- Turbidity Action Plan

Other Reports

- Stakeholders' comment letters on FAD Expert Panel review (2015)
- Final Impact Assessment on Natural Gas Production in the NYC Water Supply Watershed (DEP 2009)
- Climate Change Integrated Modeling Project Phase I Report (DEP 2013)
- NYSDOH Annual On-site Inspection Report (expected 2016)
- NYC 2016 Drinking Water Supply and Quality Report (a.k.a., Consumer Confidence Report)

**Specific Review Components**

Watershed Protection Program

The watershed protection program review will be comprehensive and include the following elements:

- Individual watershed programs
- Water quality monitoring program
- Water quality and water quality trends
- Regulatory program and enforcement of the Watershed Regulations
- Operational components related to water quality protection
- Emergency protocols

Key questions for this component include: Are watershed protection measures based on the most relevant and up-to-date scientific information (e.g. agriculture and stormwater BMPs, septic system technologies, pathogen fate and transport, buffer efficacy)? Are operational controls adequate to protect water quality and comply with FAD requirements during adverse weather events (including use of Shaft 4 interconnection and Catskill Aqueduct stop shutters)? Is alum treatment a viable response to extreme weather events?

Future Risks

This review must also evaluate future risks to the water supply focusing on the unique risks due to the unfiltered status of the water supply. Potential risks include but are not limited to:

- Climate change (chronic and acute impacts)
- Invasive species and wildlife impacts
- Forest health
- Development and infrastructure trends
- Land use trends (e.g., changing uses of State land and recreational activities)
- Regulatory trends (federal, State and local)
- Emerging contaminants and pathogens

Evaluation Approaches

The City follows an adaptive management approach to watershed protection which requires a frequent assessment of individual components as well as the watershed protection program as a whole. Current evaluation methods include: program-specific assessments, annual and 5-year programmatic reviews, analysis of water quality trends and multi-tiered modeling. This review will assess the different evaluation approaches, specifically looking at:

- Water quality monitoring program
- Statistical analysis of water quality data
- Balance of watershed protection components (e.g., operational flexibility, regulatory, voluntary and partnership programs)
- Link between program implementation and water quality changes

Key questions for this component include: Are program metrics/assessments effective/adequate? Is model verification adequate? How else might modeling or other modeling techniques be used? Can existing water quality monitoring data collected during past extreme weather events be used in OST modeling or otherwise be used to better understand and plan for future extreme events? Is enough monitoring or the right monitoring being done to detect imminent risks to and/or long term trends in water quality? Are large storm events adequately represented in the monitoring program? Do phosphorus sampling protocols adequately represent water quality in order to inform analysis of potential phosphorus impacts? Are the right statistics being used or are statistics being used most effectively to identify water quality trends? Is the current suite of programs, ranging from land ownership to implementation of WR&Rs to partnership programs, appropriate to achieve the ultimate goal of minimizing the potential for contamination by *Giardia lamblia* cysts and viruses in the source water? Does this suite of programs reflect a workable balance between land ownership and land use controls? Is it effective, efficient, and sustainable? To what extent is it possible to make links between watershed program implementation and water quality changes? How can these links best be made?

Recommendations

An essential outcome of this review is recommendations to enhance the watershed protection program. These recommendations should be supported with well-developed justifications, a description of anticipated benefits to the water supply and a discussion of cost-effectiveness. Given the range of issues and variability across the watershed, the recommendations should be grouped into three broad categories:

- Program-specific Recommendations
- System-specific Recommendations
  - Delaware System (Cannonsville, Pepacton, Neversink and Rondout basins)
  - Catskill System (Schoharie and Ashokan basins)
  - Catskill/Delaware System East-of-Hudson (Subgroup 1 - West Branch, Boyds Corners and Kensico; Subgroup 2 - Croton Falls and Cross River basins)
- Overarching Recommendations
  - Recommendations that address system-wide issues
  - Recommendations for additional research and/or planning to address future potential risks